

G83/G98 Single Premises
Chapters C to E

C. An Overview of Getting Connected

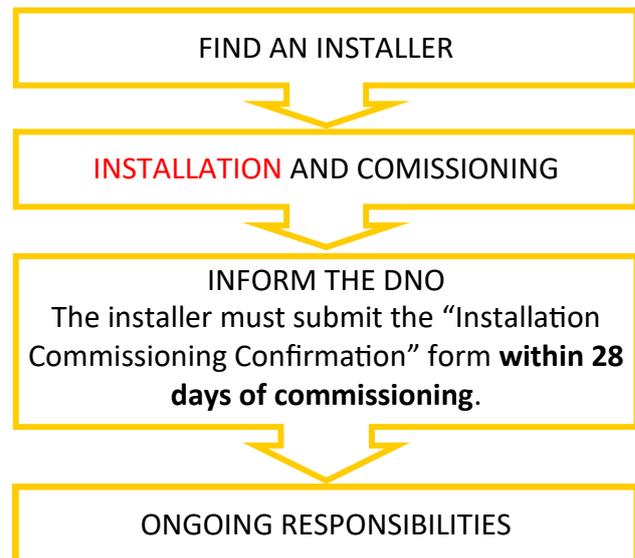
In this section:

- An introduction to getting connected
- The main tasks in the process of connecting one or more units within a single customer's installation, and who can help you
- Guidance on where to find more information

Introduction

In most cases, the installation of small generating units into a single premises will have very little effect on the network. Therefore the connection process is relatively simple, and can be summarised as “fit and inform”.

The diagram opposite presents the key actions that you have to complete to connect one or more units of small-scale generation in a single premises. These tasks are based on the requirements set out in EREC **G83/G98** and are described in more detail in this section.



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. See www.nie.co.uk

Grace Period: EREC G98 was introduced in May 2018. It is based on EREC G83, which was revised to take account of a European Network Code called Requirement for Generators. Generation connecting before 27th April 2019 can be connected under either EREC G83 or EREC G98, depending on which document the generating unit was designed to. Generating units connecting from 27th April 2019 must connect under EREC G98.

Getting Connected — Main Tasks

Finding an installer

The first task is to find a competent installer, who is using type tested equipment (see note in “Is this the right Guide for my project?”). **Installation must be carried out by installers who are competent and have sufficient skills and training to apply safe methods of work to install a generating unit in compliance with EREC G83/G98. This includes having recognised and approved qualifications relating to the primary energy source and general electrical installations.** There are companies who design, install and commission domestic generation. They can fully certify and sign off installations. Certified generation products and installers can be found on the following website:

www.microgenerationcertification.org

The Microgeneration Certification Scheme is operated by the Department for Business, Energy and Industrial Strategy (BEIS). Your installer must be certified in order for you to claim Feed-in Tariffs, with the exception of hydro and anaerobic digestion projects, which have to go through the ROO-FIT process. There is more information about this in Section F: Selling Electricity - Feed-in Tariffs (FITs).

All Micro-generators connecting under EREC G98 must be Fully Type Tested. This is where the whole Micro-generator (SSEG in EREC G83) is type tested, rather than just part of the Micro-generator.

Installation and Commissioning

Your installer should be aware of the requirements to ensure that **installation and commissioning is in line with EREC G83/G98. This includes ensuring that the installation complies with the wiring regulations (BS 7671) and is correctly earthed. Your installer must also ensure, among other things, that:**

- **No modifications should be made to the equipment;**
- **Appropriate safety labelling is provided;**
- **The generating unit will disconnect from the distribution network if your mains power is interrupted; and**
- **The generating unit is installed in accordance with the manufacturer’s instructions.**

During the commissioning, your installer will check that your equipment is working as it should.

Informing the DNO

Once your installation and commissioning is complete, the DNO needs to be made aware of your generating unit(s). This is so that the DNO can take this into account when operating and designing the network. Your installer must notify the DNO **within 28 days** of commissioning the generating unit, and provide them with information on the installation. This is a legal requirement.

The information is captured on an **“installation commissioning confirmation”** form, which is given in [Appendix 3 of EREC G83](#), or the **“Installation Document”**, which is **Form B in Appendix 3 of EREC G98**. These are available on the Energy Networks Association website.

Note: DNOs may have their own installation commissioning confirmation forms on their websites.

Getting Connected — Main Tasks

Ongoing responsibilities

Although the focus of this Guide is to inform you about the process of connecting your generation to the distribution network, you should be aware that once it is connected you have some responsibilities. These include:

- The responsibility to keep it maintained

by someone who is competent to do so;

- **Notify your DNO of any operational incidents or failures that affect your compliance with EREC G98; and**
- **Inform your DNO if you remove or replace your generating unit.**

Getting Connected — IDNO's Networks

The process for connecting your Distributed Generation to an IDNO's network follows EREC **G83/98 or G59/G99**, and is therefore similar to connecting to a DNO's network. IDNOs are licensed entities and are bound by some of the same licence conditions as DNOs, including certain performance standards such as timescales for responding to requests for quotes. The majority of what is included in this guide applies to both DNO and IDNO connections.

However, there are a few key differences for a

Distributed Generation connection to an IDNO network. The most significant of these is that the IDNO has a relationship with their DNO. This relationship will not involve you directly, but may restrict what the IDNO can readily allow to connect to their network. This is not likely to affect a generation project that is compliant with **G83/G98**.

To determine whether you are connected to a DNO or IDNO network, refer to the guidance on page **15**.

Getting Connected — Energy Storage

Storage devices for electrical energy are becoming more prevalent, and can be used as part of Distributed Generation schemes to allow generated electricity to be stored within the premises rather than exported to the distribution network. **DNOs treat storage as demand when its importing from the distribution network and generation when its exporting to the distribution network**, and need to be aware of storage because of the potential impact on their networks. Therefore storage needs to meet the relevant connection requirements (EREC **G83/G98 or G59/G99**).

If you are planning to use storage in conjunction with PV (**or other technologies**) to offset consumption, the total connected generation is likely to be above 16A / phase and **G59/G99** applies. However, **DNOs** have implemented a fast track application process, for domestic scale storage. This typically takes the form of an online **application** and reduces the **time for the DNO to provide confirmation that the connection is acceptable** from 45 days to 10 days or less. If the storage is intended to be operated in island mode (during a power outage) the fast track process is not applicable and the standard **G59/G99** process applies.

Getting Connected

EREC G98 exceptions

If you are installing a generating unit under EREC G98 then the requirements apply in full in most circumstances. However, if your generating unit is one of the following, some of the technical requirements in EREC G98 do not apply:

- Classified as an Emerging Technology (see Emerging Technology box on page 6)
- An electricity storage device
- Has a registered capacity of < 800 W

The full details of the requirements that do not apply are in EREC G98. If you are installing generating units that are connected via an inverter, the 800 W threshold applies to the **aggregate** installed capacity of generation. So, for example, if you are installing 3 x 500 W solar PV inverters, the aggregate installed capacity exceeds 800 W and EREC G98 applies in full.

However, because storage is one of the exceptions, it does **not** count towards the aggregate capacity when considering the 800 W threshold. For example, if you are installing a 500 W solar PV inverter and a 500 W storage inverter, they are both excepted from certain requirements in EREC G98.

Health and Safety considerations

Safety is very important in the design of generation connections. Some of the safety requirements for Distributed Generation connections are set out in EREC **G83/G98**. This document references the Regulation that informs these requirements, the Electricity Safety, Quality and Continuity Regulations (ESQCR) 2002, and also lists the relevant British Standards.

You can find out more about Health and Safety aspects of Distributed Generation connections on the following websites:

- The Electrical Safety Council (ESC): www.esc.org.uk
- The Energy Networks Association—Safety, health and environment: www.energynetworks.org/electricity/she/overview.html

Supply Issues

Your DNO is obligated to maintain the power quality on their network within a set of defined limits. These include maintaining voltage at the required levels. This is so that customer equipment is not damaged. If you have a voltage complaint you should contact your DNO. Your DNO should respond to your complaint within 5 working days, or visit within 7 working days. If work is required to correct the issue, the DNO should complete this within 6 months.

In rare cases, such as where there are many generating units in a small area, the DNO may feel it is necessary to for you to disconnect your generating unit in order to maintain the power quality on the network. This will be a temporary measure until the problem is resolved. As long as your equipment and its installation complies with **G83/G98**, then the DNO will be responsible for resolving the problem at their own expense. The timescales for this will depend on the nature and complexity of work to be done.

Where to Find More Information

If you want to find out more, these documents are particularly relevant:

- [Engineering Recommendation 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. This can be downloaded via the [DCode](#) as well as ENA website.
- [Engineering Recommendation G83](#): Recommendations for the Connection of Type Tested Small-scale Embedded Generators (Up to 16 A per Phase) in Parallel with Low-Voltage Distribution Systems — a technical document, with references to other relevant sources of detailed technical information. This is available to download via the [DCode](#) as well as ENA website.
- [Electricity Safety, Quality and Continuity Regulations \(ESQCR\) 2002, Section 22](#): Statutory Instrument Number 2665, available free of charge.
- Ofgem’s information about [how to get an electricity connection](#) for a new building or site.

Some DNOs have produced their own guidance notes for small scale Distributed Generation connections - check your DNO’s website.

Dealing with disputes

If you are not satisfied with a particular aspect of service during the process of connecting your generation, your first port of call should be the party with whom the issue lies, eg. the DNO, supplier, etc. DNOs have their complaints process set out on their websites. If you still cannot resolve the issue you can contact the Energy Ombudsman:

www.ombudsman-services.org/energy.html

If you are still unable to resolve the matter, as a last resort it can be referred to Ofgem.

D. The Connection Application: Connection Notification

In this section:

- What the installer of your generating unit needs to do to notify the DNO that your generation has been installed and commissioned in accordance with EREC **G83/G98**
- Details of the information that you will need to provide to the DNO.

Introduction

Under the provisions of the Electricity Safety, Quality and Continuity regulations (ESQCR) you only need to inform the DNO that you have installed your generating unit. You do not need to contact the DNO in advance if the total capacity of all your generating units combined is 16 Amps or less per phase at low

voltage.

This section of the Guide summarises the information which you will need to provide to your DNO and gives information about the forms that are used for providing the necessary technical details.

The Commissioning Pro-forma

You do not need to talk to your DNO before your generation equipment is up and running. Your installer must inform the DNO and provide a number of pieces of information **within 28 days of the date of commissioning**. This information is defined in a Commissioning Pro-forma, which is provided in [Appendix 3 of EREC G83](#), or in an **Installation Document**, which is provided in **Appendix 3 of EREC G98**. **These forms are** available on the [Energy Networks Association website](#).

Your installer should prepare all of the details requested in the Commissioning Pro-forma (or **Installation Document, as appropriate**) and submit all this with the form to confirm that your equipment has been commissioned.

The information required includes:

- details about the **site** where you are

connecting your generating unit, including metering information;

- **contact details** for the owner of the generating unit;
- **technical information** about the generating unit itself, including the generating capacity, type test reference and primary energy source;
- details of the **installer** of the generating unit, including the party's accreditation and qualifications;
- **supporting information**, eg. circuit diagrams; and
- a **signed declaration** as to the compliance of the generating unit with the requirements of EREC **G83/G98**.

Other Requirements

The declaration that your installer signs on the Commissioning Pro-forma / **Installation Document** requires them to confirm that they've installed your generating unit in accordance with EREC **G83/G98**. It's important that you use an installer who is familiar with the requirements of these standards. If you appoint a competent

installer (see Section C: An Overview of Getting Connected), they should know about these standards and make sure that your installation meets with all the relevant standards. You should check that your installer is aware of all these requirements.

E. Cost and Charges

Use of System Charges

Use of System charges are levied by the DNO to the supplier, so as a generator you will not be charged these directly. However, this section is included for your information, as Use of System charges may appear as an item on your bill.

What are Use of System charges?

Use of System charges cover the development, operation, maintenance and repair of the distribution network. DNOs make Use of System charges to suppliers. Suppliers may reflect these charges to their customers as either:

- a 'pass-through' item so that the customer can clearly see the Use of System element; or
- 'wrapped-up' in a total electricity supply tariff where the customer may not be able to clearly see the Use of System element.

DNOs are obliged to publish documents about their Use of System charges. These cover their Use of System charging methodology and a statement of what the charges are for both generation and demand customers. You can find these on DNOs' websites.

All generators connected at Low Voltage are subject to Generation Distribution Use of System charges under the Common Distribution Charging Methodology (CDCM). These charges may be negative (ie credits). You can find out more about the Common Distribution Charging Methodology (CDCM) by looking at [Distribution Charging](#) on the Ofgem website, [Distribution Charges Overview](#) on the Energy Networks Association website and some DNOs' websites.

Categories of Use of System charges

UoS charges are categorised by:

- the voltage level your equipment is connected to and;
- the type of meter you have.

The boxes below define the voltage level that will apply to EREC **G83/G98** compliant equipment (Low Voltage) and the metering arrangements that are likely to apply to this equipment (Non-Half Hourly meters). 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).

Non-Half Hourly Meters (NHH)

NHH meters record total energy passing through the meter, but do not record the times the energy is transferred. Typically the recorded data would be collected a few times a year, eg. every quarter. Most domestic and small commercial properties have NHH meters. You can contact your current electricity supplier to discuss the provision of NHH meters, or other meter suppliers.

LV (Low Voltage)	400/230 V in practice, less than 1 kV in general.
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G83/G98 Multiple Premises
Chapters C to E

C. An Overview of Getting Connected

In this section:

- An introduction to getting connected
- The main tasks in the process of connecting small generating units in multiple premises
- Guidance on where to find more information

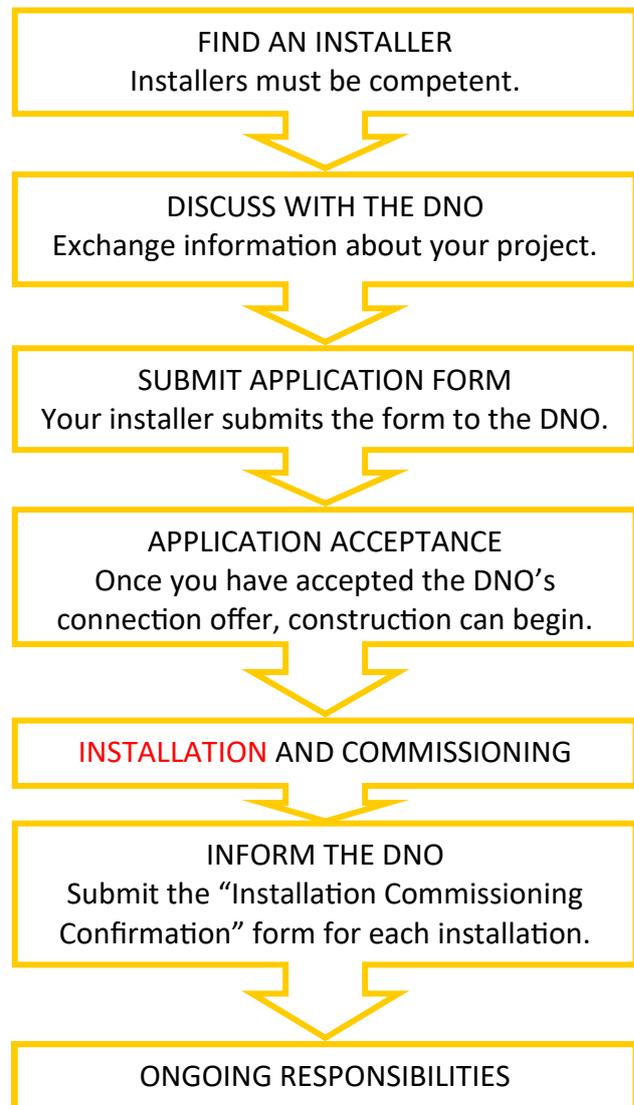
Introduction

While the process for connecting small-scale generation in a single premises is relatively simple, the process for connecting small-scale generation in multiple premises is more involved. Projects involving multiple installations could be, for example:

- A housing refurbishment programme in the same road or street
- A new housing development

There is a key difference between connecting units at one customer site and multiple units within different customer sites within a close geographic region: for multiple sites **you need to get approval from the Distribution Network Operator (DNO)** before you can connect.

The diagram opposite presents the key actions that you have to complete to connect multiple units of small-scale generation within different customer sites and in a close geographic region. These tasks are based on the requirements set out in EREC **G83/G98**, and are described further in this section.



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. See www.nie.co.uk

Getting Connected—Main Tasks

Finding an Installer

The first task is to find a competent installer, who is using type tested equipment (see note in “Is this the right Guide for my project?”).

Installation must be carried out by installers who are competent and have sufficient skills and training to apply safe methods of work to install a generating unit in compliance with EREC G83/G98. This includes having recognised and approved qualifications relating to the primary energy source and general electrical installations. There are companies who design, install and commission domestic generation. They can fully certify and sign off installations.

Certified generation products and installers can be found on the following website:

www.microgenerationcertification.org

The Microgeneration Certification Scheme is operated by the Department for Business, Energy and Industrial Strategy (BEIS). Your installer must be certified in order for you to claim Feed-in Tariffs, with the exception of hydro and anaerobic digestion projects, which have to go through the ROO-FIT process. There is more information about this in Section F: Selling Electricity - Feed-in Tariffs (FITs).

All Micro-generators connecting under EREC G98 must be Fully Type Tested. This is where the whole Micro-generator (SSEG in EREC G83) is type tested, rather than just part of the Micro-generator.

Discussions with the DNO

You must discuss your plans with the DNO before starting work. You should do this as soon as possible in your planning, as the DNO’s response may have a big impact on how you plan your project. You may discuss the feasibility of your connection, and if there will be any charges for connection (charges are discussed further in Section E—Costs and Charges).

If your generation project is part of a larger project, eg. developing new housing, then your application needs to be co-ordinated with the connection application for the import supplies themselves. The DNO will need to take into account the new generation in the design of the overall connection.

All DNOs provide information to support generation developers, such as capacity heat maps, on their websites. These can be an important source of information. In addition, there may be dedicated generation ‘surgeries’ or ‘drop in’ sessions to discuss your project with the DNO.

Submitting an 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. The format of the application form is given in [Appendix 2 of EREC G83](#) / [Form A in Appendix 3 of EREC G98](#), which are available on the Energy Network Association’s website. Your installer should submit the application form on your behalf.

Application acceptance

When you submit your application form you need to include technical details of the equipment. The DNO needs this information to assess the impact that your generating equipment 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 (charges are discussed further in Section E—Costs and Charges). You should ensure that you fully understand this offer before accepting it. You should discuss questions with your DNO if you are unsure.

Getting Connected—Main Tasks

Installation and Commissioning

Your installer should be aware of the requirements to ensure that **installation** and commissioning is in line with EREC **G83/G98**. **This includes ensuring that the installation complies with the wiring regulations (BS 7671) and is correctly earthed.**

Your installer must also ensure, among other things, that:

- **No modifications should be made to the equipment;**
- **Appropriate safety labelling is provided;**
- **The generating unit will disconnect from the distribution network if your mains power is interrupted; and**
- **The generating unit is installed in accordance with the manufacturer's instructions**

During the commissioning, your installer will check that your equipment is working as it should.

Informing the DNO

Once your installation is complete, the DNO needs to be made aware of your generating unit(s). This is so that the DNO can take this into account when operating and designing the network.

Your installer must notify the DNO within 28 days of commissioning the generating units in each premises, and provide them with information on the installation. The content and format of the installation commissioning confirmation is set out in [Appendix 3 of EREC G83](#), or the “Installation Document”, which is **Form B in Appendix 3 of the EREC G98**. **These forms are** available on the Energy Networks Association website.

Note: DNOs may have their own installation commissioning confirmation forms on their websites—a web search should help you locate the forms you need, or try telephoning your DNO.

Ongoing responsibilities

Although the focus of this Guide is to inform you about the process of connecting generation to the distribution network, you (or the owner of the equipment if that is not you) should be aware that once it is connected you have some responsibilities. These include:

- The responsibility to keep it maintained by someone who is competent to do so;
- **Notify your DNO of any operational incidents or failures that affect your compliance with EREC G98;** and
- **Inform your DNO if you remove or replace your generating unit.**

Getting Connected — IDNO's Networks

The process for connecting your Distributed Generation to an IDNO's network follows EREC **G83/G98** or **G59/G99**, and is therefore similar to connecting to a DNO's network. IDNOs are licensed entities and are bound by some of the same licence conditions as DNOs, including certain performance standards such as timescales for responding to requests for quotes. The majority of what is included in this guide applies to both DNO and IDNO connections. However, there are a few key

differences for a Distributed Generation connection to an IDNO network:

- **Provision of Information:** IDNOs have a reduced set of licence conditions compared with DNOs, and they are not obliged to provide the same documents for customers. IDNOs are not required to produce Long Term Development Statements nor Connection Charging methodologies and statements.

Getting Connected — IDNO's Networks

- **Interaction between the IDNO and the DNO:** When an IDNO receives an application for connection for Distributed Generation, they need to get approval from the DNO before they can offer to connect you.
- If your generation project would cause certain network parameters to exceed defined limits, such as voltage or export to the DNO network, the IDNO and DNO will explore options for accommodating your project. This discussion will take place between the IDNO and the DNO, and will not involve you directly. However, the IDNO may then discuss different options with you for the most appropriate generation project to be connected.
- **Formal Agreements:** IDNOs will not necessarily insist on the same set of formal agreements that the DNOs will. Agreements such as the connection and adoption agreements may not be required.

To determine whether you are connected to a DNO or IDNO network, refer to the guidance on page 15.

Customer Service and Provision of Information

There are a number of drivers for DNOs to provide a good level of service to customers, including:

- The new price control proposals;
- Standards of Performance; and
- Ofgem **DER** forums.

Price Control Proposals (RIIO-ED1)

Ofgem administers a price control regime which allows DNOs to earn a fair rate of return while limiting costs passed on to customers. The current price control period is called RIIO-ED1, which runs until 2023. The RIIO-ED1 proposals include a number of mechanisms to incentivise DNOs to provide a good service to Distributed Generation customers, including:

- A new Time to Connect Incentive for minor connections customers (less than 70kW and connected at LV);
- An Incentive on Connections Engagement (ICE) - 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:

- Part 1: Plans for improvements for the forthcoming year; and
- Part 2: Reviews the progress in the previous year.

ICE workplans can be found on individual DNO websites

- The Broad Measure of Customer Satisfaction (BMCS) surveys.

DNOs publish annual [ICE plans for stakeholder engagement](#).

Guaranteed Standards of Performance

The guaranteed standards of Performance are set out in Standard Licence Condition 15A. They include, for example, maximum timescales in which DNOs must provide you with a quotation (Connection Offer). Ofgem has guidance documents about these Standards on their [website](#).

Customer Service and Provision of Information

Distributed Energy Resources (DER) Forum

The **Distributed Energy Resource (DER)** Forums, hosted by the ENA on behalf of DNOs, are events that are used to explore issues and concerns around Distributed Generation connections, including barriers to Distributed Generation and process issues. They are open to anyone, and are attended by DNOs and developers. Details can be found on the [ENA Events website](#).

Improvements made to DNO Services

In recent years, there have been a number of improvements to DNO services as a response to these drivers and feedback, including:

- Increased internal resources;
- Improved provision of information, including more detailed breakdown of costs, web portals, decision support tools/application hotline, and capacity “heat maps”, indicating areas that can more readily facilitate connections;
- Holding stakeholder and customer events; and

- Exploring the possibility for discussions prior to formal application (“connection optioneering”). This process is being carried out in different ways by different DNOs. Refer to your DNO for more information.

DNOs have promised to bring about continued improvements, including:

- Shortening connection timescales;
- Enhancing the publicly available network capacity information, eg. contracted capacity reports;
- Publishing case studies; and
- Enhancing the connection application and the wayleaves/consents processes.

DNOs publish Distributed Generation 'Work Plans' that outline progress against improvement initiatives. Check your DNO's Distributed Generation web pages.

Getting Connected — Energy Storage

Storage devices for electrical energy are becoming more prevalent, and can be used as part of Distributed Generation schemes to allow generated electricity to be stored within the premises rather than exported to the distribution network. **DNOs treat storage as demand when its importing from the distribution network and generation when its exporting to the distribution network**, and need to be aware of storage because of the potential impact on their networks. Therefore storage needs to meet the relevant connection requirements (EREC **G83/G98** or **G59/G99**).

If you are planning to use storage in conjunction with PV (**or other technologies**) to offset consumption, the total connected generation is likely to be above 16A / phase and **G59/G99** applies. However, **DNOs have** implemented a fast track application process, for domestic scale storage. This typically takes the form of an online **application** and reduces the **time for the DNO to provide confirmation that the connection is acceptable** from 45 days to 10 days or less. If the storage is intended to be operated in island mode (during a power outage) the fast track process is not applicable and the standard **G59/G99** process applies.

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EREC G98 exceptions

If you are installing a generating unit under EREC G98 then the requirements apply in full in most circumstances. However, if your generating unit is one of the following, some of the technical requirements in EREC G98 do not apply:

- Classified as an Emerging Technology (see Emerging Technology box on page 6 in G59 full)
- An electricity storage device
- Has a registered capacity of < 800 W

The full details of the requirements that do not apply are in EREC G98.

If you are installing generating units that are connected via an inverter, the 800 W threshold applies to the **aggregate** installed capacity of generation. So, for example, if you are installing 3 x 500 W solar PV inverters, the aggregate installed capacity exceeds 800 W and EREC G98 applies in full. However, because storage is one of the exceptions, it does **not** count towards the aggregate capacity when considering the 800 W threshold. For example, if you are installing a 500 W solar PV inverter and a 500 W storage inverter, they are both excepted from certain requirements in EREC G98.

Supply Issues

Your DNO is obligated to maintain the power quality on their network within a set of defined limits. These include maintaining voltage at the required levels. This is so that customer equipment is not damaged. If you have a voltage complaint you should contact your DNO. Your DNO should respond to your complaint within 5 working days, or visit within 7 working days. If work is required to correct the issue, the DNO should complete this within 6 months.

Health and Safety considerations

Safety is very important in the design of generation connections. Some of the safety requirements for Distributed Generation connections are set out in EREC **G83/G98**. This document references the Regulation that informs these requirements, the Electricity Safety, Quality and Continuity Regulations (ESQCR) 2002, and also lists the relevant British Standards.

You can find out more about Health and Safety aspects of Distributed Generation connections on the following websites:

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Where to Find More Information

If you want to find out more, these documents are particularly relevant:

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Dealing with disputes

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If you are still unable to resolve the matter, as a last resort it can be referred to Ofgem.

D. The Connection Application: Connection Application Process

In this section:

- How to apply to your DNO for connecting generating units in multiple premises
- Details of the information that you will need to provide to the DNO and the design work they may need to do to assess your connection
- How to notify the DNO that your generation unit(s) has been installed and commissioned in accordance with EREC **G83/G98**

Introduction

This section of the Guide describes how to inform your DNO that you are planning to install a number of generating units that fall under EREC **G83/G98** in to different customer sites within a close geographic region.

This section also explains the notifications which the installer of your equipment will need to give to your DNO once the units are commissioned.

The Application for Connection Pro-forma

The Application for Connection Pro-forma included in EREC **G83/G98** should be completed by your installer if you are planning to install generating units covered by EREC **G83/G98** in different customer sites within a close geographic region. This should be submitted **before any generation is installed**, as the DNO needs to assess the possible impact of your generating equipment on the distribution network. The format for the application is shown in [Appendix 2 of EREC G83](#), or in [Form B in Appendix 3 of EREC G98](#). [These are available on the Energy Networks Association website](#).

The form requires a number of pieces of information:

- 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.

When the application has been submitted to the DNO by your installer, the DNO will assess the impact of the generation on their network. Where necessary, they will carry out design work, eg. for network reinforcement.

As mentioned, if your generation project is part of a larger project, eg. developing new housing, then your application needs to be co-ordinated with the connection application for import supplies.

Connection of the generation equipment will only be allowed to proceed after the DNO has approved the application, and any facilitating works for the connection have been completed.

Installation and Commissioning

If the DNO gives permission for the installation of your generation equipment to proceed, your installer will install and commission the generating units. They must then notify the DNO that this has been done, in accordance

with the Electricity Safety, Quality and Continuity Regulations (ESQCR). The process and timescales for doing this are described below.

The Commissioning Pro-forma

The installer of your generating units has to tell the DNO about each generation installation **within 28 days of the date of commissioning** (including the commissioning day itself).

The Commissioning Pro-forma included in EREC G83, **known as the Installation Document in EREC G98**, is a convenient way of capturing all of the information that the DNO needs to know once your installer has commissioned each of your generating units.

This can be found in [Appendix 3 of EREC G83](#), or **Form B in Appendix 3 of EREC G98**. These are available on the [Energy Networks Association website](#).

The information required includes:

- details about the **site** where you are connecting your generating unit, including metering information;

- **contact details** for the owner of the generating unit;
- **technical information** about the generating unit itself, including the generating capacity, type test reference and primary energy source;
- details of the **installer** of the generating unit, including the party's accreditation and qualifications;
- **supporting information**, eg. circuit diagrams; and
- a **signed declaration** as to the compliance of the generating unit with the requirements of **G83/G98**.

One commissioning pro-forma is required for each generating unit.

Other Requirements

The declaration that your installer signs on the Commissioning Pro-forma / **Installation Document** requires them to confirm that they've installed your generating unit in accordance with EREC **G83/G98**. It's important that you use an installer who is

familiar with the requirements of these standards. If you appoint a competent installer (see Section C. An Overview of Getting Connected), they should know about these standards and make sure that your installation meets with all the relevant standards.

E. Cost and Charges: Overview of Charges

In this section:

- An introduction to connection costs
- The basis of DNO connection charges for infrastructure
- Other elements of connection charges and where to find indicative costs and examples
- Generation Distribution Use of System charges

Read the boxes for definitions or explanations of terms that may be new or unfamiliar.

Introduction

There are two categories of charges made by the DNO:

- **Connection charge:** this is a one-off charge made by the DNO, which primarily covers the cost of work and equipment associated with connecting your generating project to the distribution network.
- **Use of System charges:** these are ongoing charges, which primarily cover operation and maintenance costs and include the costs of ongoing network development including general reinforcement.

DNOs are obliged to publish documents describing the basis of their connection charges and their charging methodology. They also present the different elements of connection charges, and indicative costs for works and equipment of significant cost. This will help you to understand the charges they quote you.

This information is contained in the DNOs Statement of Methodology and Charges for Connection to the electricity distribution

system. All DNOs' statements follow the same format, and are available on their websites.

This document contains:

- The DNO's connection charging methodology (iehow they calculate their charges);
- The DNO's connection charging statement (iewhat the charges are);
- An indication of the costs of providing a connection quotation / budget estimate; and
- Other relevant information for connecting customers.

The basis and elements of connection charges, as well as indicative costs and examples are discussed in this section.

Use of System charges are levied by the DNO on the supplier, so as a generator you will not be charged these directly. However, this section is included for your information, as Use of System charges may appear as an item on your bill.

Connection Charges

Depending on the location and size of your generating units, new equipment and reinforcement to the existing network may be necessary to accommodate your generation. In the connection charge, you will be charged for any extension to the network.

DNOs are obliged to publish a document describing the basis of their connection charges and their charging methodology. You can refer to this document to see what costs you will be charged for. These are available on DNO websites.

Connection Charges—Other Elements

Elements of charges

As well as charges for any network extension (if required), there are other elements that are covered in the connection charge. These can include the following:

- System / feasibility / fault level studies
- Provision of Wayleaves
- Additional meetings with the DNO or site visits
- Administration

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.

Indicative costs and examples

Equipment costs and charges for services vary across DNOs; it could therefore be misleading to list indicative costs in this Guide. If you want to get an idea for indicative costs, the best place to look is the **DNO's Statement of methodology and charges for connection**. You can find this on the DNO's website.

Aside from giving indicative costs for connection charges, these documents typically contain other useful information, including guidance on the connection process and examples of various connections and their associated cost breakdown. It is updated annually.

The connection charging methodology is governed by the Distribution Connection and Use of System Agreement (DCUSA) and is

subject to open governance so any party materially affected by it can propose a change to it. The process for doing this is laid out within the DCUSA itself. See the DCUSA website for more information:

www.dcusa.co.uk

[The Distribution Charging Methodologies Forum](#) exists to enable parties to discuss ideas for improving the methodology possibly prior to submitting a formal change proposal.

Estimating costs and getting a quotation

As mentioned, you can obtain indicative costs for works and equipment from DNO documents. To obtain a more accurate picture of the connection costs for your project, you can:

- Ask the DNO for a budget estimate
- Obtain an estimate of connection costs from a specialist engineering consultant

You should exercise care in interpreting budget estimates.

Payment of connection charges

Connection charges are paid either:

- in full at the time that the connection offer is accepted; or
- in staged or phased payments, as per a payment schedule.

Staged payments are typically used for generation projects which are greater than a certain size, eg. in project value or duration. The staged payments cover committed

Connection Charges—Other Elements

expenditure by the DNO.

If your connection does not proceed, it is possible that some of the connection charge will be refundable depending on if the DNO has performed the work. You should inform

your DNO as soon as possible if you decide not to go ahead with your project.

What is a budget estimate?

You may read about **budget** or **indicative estimates** and **formal quotations**. The differences between these two terms are summarised in the following table.

Budget or Indicative estimate	Formal quotation
Requested in the early stage of a project, and generally only for larger capital schemes	Requested when electrical requirements have been finalised
The DNO doesn't require much information from you	The DNO requires a lot of information from you
Based on a desktop study—the DNO is unlikely to carry out detailed designs or studies	Based on detailed design work, and may require other input such as site surveys
To give an indication of costs, and is therefore subject to change	Provides formal contract offer
Not open for acceptance	Open to acceptance, subject to conditions
DNO may charge	DNO will not charge

Assuming that you ask the DNO to undertake all of the work involved in your connection, the timescale for the DNO to provide a budget estimate is 10 working days.

Connection Offer expenses (Assessment and Design fees)

Following a recent government consultation, BEIS is now allowing DNOs to charge Connection Offer expenses (also known as Assessment and Design fees), regardless of whether or not the subsequent Connection Offer is accepted. Connection Offer expenses are a charge by the DNO for the cost of producing Connection Offers, and cover activities such as network modelling, connection design and site surveys. DNOs may apply these charges from April 2018. For further information on the recent consultation, refer to the [BEIS website](#).

Note that DNOs are applying these charges differently. For example, some are only applying them to projects with certain connection voltages. Refer to your DNO website for details on how they are applying the charges.

Use of System Charges

Use of System charges are levied by the DNO to the supplier, so as a generator you will not be charged these directly. However, this section is included for your information, as Use of System charges may appear as an item on your bill.

What are Use of System charges?

Use of System charges cover the development, operation, maintenance and repair of the distribution network. DNOs make Use of System charges to suppliers. Suppliers may reflect these charges to their customers as either:

- a 'pass-through' item so that the customer can clearly see the Use of System element; or
- 'wrapped-up' in a total electricity supply tariff where the customer may not be able to clearly see the Use of System element.

DNOs are obliged to publish documents about their Use of System charges. These cover their Use of System charging methodology and a statement of what the charges are for both generation and demand customers. You can find these on DNOs' websites. All

generators connected at Low Voltage are subject to Generation Distribution Use of System charges under the Common Distribution Charging Methodology (CDCM). These charges are currently negative (iecredits). You can find out more about the Common Distribution Charging Methodology (CDCM) by looking at [Distribution Charging](#) on the Ofgem website, [Distribution Charges Overview](#) on the Energy Networks Association website and some DNOs' websites.

Categories of Use of System charges

UoS charges are categorised by:

- the voltage level your equipment is connected to and;
- the type of meter you have.

The boxes below define the voltage level that will apply to EREC **G83/G98** compliant equipment (Low Voltage) and the metering arrangements that are likely to apply to this equipment (Non-Half Hourly meters). 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).

LV (Low Voltage)	400/230 V in practice, less than 1 kV in general.
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Non-Half Hourly Meters (NHH)

NHH meters record total energy passing through the meter, but do not record the times the energy is transferred. Typically the recorded data would be collected a few times a year, eg. every quarter. Most domestic and small commercial properties have NHH meters. You can contact your current electricity supplier to discuss the provision of NHH meters, or other meter suppliers.

G59 50kW
Chapters C to E

C. An Overview of Getting Connected

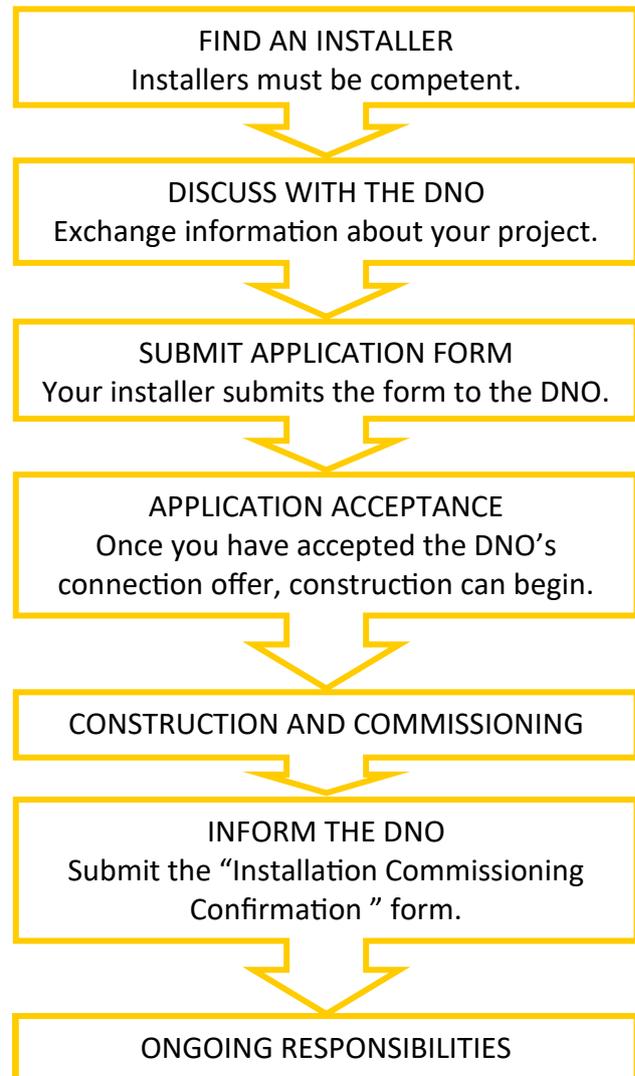
In this section:

- An introduction to getting connected
- The main tasks in the process of connecting generating units that are covered by EREC G59 but are 50 kW or less (three phase)
- The provision of information and customer service standards
- A discussion on connecting to an IDNO network
- Guidance on where to find more information

Introduction

This Guide describes the process for connecting smaller projects under EREC G59. Separate Distributed Generation Connection Guides are available for connecting under EREC G99.

Under EREC G59, smaller generation projects which are type tested have a slightly different connection process. This applies to generation which has a capacity of 50 kW or less three phase, or 17 kW or less single phase. The diagram opposite shows the key steps in this process. These tasks are based on the requirements set out in EREC G59. This Guide is written for EREC G59 compliant installations where the equipment to be installed is type tested according to EREC G59 or G83, and the generating capacity of the generating units is 50 kW or less three phase, or 17 kW or less single phase. In addition, this Guide is aimed at generation projects where the connection requires only a minimum amount of network extension and makes use of the Feed-in Tariff (FITs) scheme (rather than Contracts for Difference or CFD). If your installation is covered by EREC G59, but does not align with the above, please refer to the full EREC G59 Guide. You can find out which guide is best for your project in 'Distributed Generation Connection Guide: Is this the right Guide for my project?' at the beginning of this Guide.



Getting Connected—Main Tasks

Finding an Installer

The first task is to find a competent installer, who is using type tested equipment (see note in “Is this the right Guide for my project?”). There are companies who design, install and commission domestic generation. They can fully certify and sign off installations.

Certified generation products and installers can be found on the following website:

www.microgenerationcertification.org

The Microgeneration Certification Scheme is operated by the Department for Business, Energy and Industrial Strategy (BEIS).

Discussions with the DNO

You must discuss your plans with the DNO before starting work. You should do this as soon as possible in your planning, as the DNO’s response may have a big impact on how you plan your project. You may discuss the feasibility of your connection, and if there will be any charges for connection (charges are discussed further in Section E: Costs and Charges).

All DNOs provide information to support generation developers, such as capacity heat maps, on their websites. These can be an important source of information. In addition, there may be dedicated generation ‘surgeries’ or ‘drop in’ sessions to discuss your project with the DNO.

Submitting an 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. The format of the application form is given in Appendix 13.5 of EREC G59, which is available from the [Energy Network](http://www.energy-network.co.uk)

[Association’s website](#). Your installer should submit the application form on your behalf.

Application Acceptance

When you submit your application form you need to include technical details of the equipment. The DNO needs this information to assess the impact that your generating equipment 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 (charges are discussed further in Section E: Costs and Charges). You should ensure that you fully understand this offer before accepting it. You should discuss questions with your DNO if you are unsure.

Construction and Commissioning

You should maintain close contact with the DNO throughout construction. This is so that you are aware of the timeline of any reinforcement works that they need to do, and you can plan your project with this in mind.

EREC G59 details the commissioning tests that you or your installer need to perform. Because your equipment is type tested, you only need to complete tests in Section 12.3 of EREC G59. Commissioning can only take place once the construction is complete.

For an installation of this type, your DNO will not normally need to witness the commissioning testing. However, your DNO may choose to do so. If this is the case, they will state this in their connection offer.

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. See www.nie.co.uk

Getting Connected—Main Tasks

If your commissioning tests are being witnessed by the DNO, you or your installer should discuss the scope of the testing with the DNO from an early stage, and must submit the scope, time and date of the testing at least 15 days before commissioning takes place.

Informing the DNO

Your installer should notify the DNO **within 28 days** of commissioning the generating unit, and provide them with information on the installation and the full results of the commissioning tests. This information is called “**installation commissioning confirmation**”.

The content and format of the installation commissioning confirmation is set out in Appendix 13.2 of EREC G59. If your commissioning is being witnessed by the DNO, then this form can be filled out and handed to the DNO representative witnessing.

The form includes a declaration that the installer must sign. This states that the installation complies with EREC G59.

Note: DNOs may have their own installation commissioning confirmation forms on their websites—a web search should help you locate the forms you need, or try telephoning your DNO.

Ongoing responsibilities

Although the focus of this Guide is to inform you about the process of connecting your generation to the distribution network, you should be aware that once it is connected you have some responsibilities. This includes:

- Keeping your generation equipment maintained by someone who is competent to do so;
- Performing periodic tests that are required by the DNO. They will discuss these with you;
- Informing the DNO if there are changes to the installation that affect the generating characteristics;
- Complying with Health and Safety requirements; and
- When you are decommissioning your generating unit(s), you need to send the DNO certain information. This is detailed in EREC G59 Appendix 13.4

Appendix 13.9 in EREC G59 is called “Main Statutory and other Obligations” and summarises the main obligations on generators.

Dealing with disputes

If you are not satisfied with a particular aspect of service during the process of connecting your generation, your first port of call should be the party with whom the issue lies, eg. the DNO, supplier, etc. DNOs have their complaints process set out on their website. If you still cannot resolve the issue you can contact the Energy Ombudsman:

www.ombudsman-services.org/energy.html

If you are still unable to resolve the matter, as a last resort it can be referred to Ofgem.

Supply Issues

Your DNO is obligated to maintain the power quality on their network within a set of defined limits. These include maintaining voltage at the required levels. This is so that customer equipment is not damaged. If you have a voltage complaint you should contact your DNO. Your DNO should respond to your complaint within 5 working days, or visit within 7 working days. If work is required to correct the issue, the DNO should complete this within 6 months.

Customer Service and Provision of Information

There are a number of drivers for DNOs to provide a good level of service to customers.

Price Control Proposals (RIIO-ED1)

Ofgem administers a price control regime which allows DNOs to earn a fair rate of return while limiting costs passed on to customers. The current price control period is called RIIO-ED1, which runs until 2023. The RIIO-ED1 proposals include a number of mechanisms to incentivise DNOs to provide a good service to Distributed Generation customers, including:

- A new Time to Connect Incentive for minor connections customers (less than 70kW and connected at LV);
- An Incentive on Connections Engagement (ICE) - 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:
 - Part 1: Plans for improvements for the forthcoming year; and
 - Part 2: Reviews the progress in the previous year.

ICE workplans can be found on individual DNO websites

- The Broad Measure of Customer Satisfaction (BMCS) surveys.

As part of the Incentive on Connections Engagement (ICE), DNOs publish annual [ICE plans for stakeholder engagement](#).

Guaranteed Standards of Performance

The guaranteed standards of Performance are set out in Standard Licence Condition 15A. They include, for example, maximum timescales in which DNOs must provide you with a quotation (Connection Offer). Ofgem has guidance documents about these Standards on their [website](#).

Distributed Energy Resources (DER) Forum

The DER Forums, hosted by the ENA on behalf of DNOs, are events that are used to explore issues and concerns around Distributed Generation connections, including barriers to Distributed Generation and process issues. They are open to anyone, and are attended by DNOs and developers. Details can be found on the [ENA Events website](#).

Improvements made to DNO Services

In recent years, there have been a number of improvements to DNO services as a response to these drivers and feedback, including:

- Increased internal resources;
- Improved provision of information, including more detailed breakdown of costs, web portals, decision support tools/application hotline, and capacity “heat maps”, indicating areas that can more readily facilitate connections;
- Holding stakeholder and customer events; and
- Exploring the possibility for discussions prior to formal application (“connection optioneering”). This process is being carried out in different ways by different DNOs. Refer to your DNO for more information.

DNOs have promised to bring about continued improvements, including:

- Shortening connection timescales;
- Enhancing the publicly available network capacity information, eg. contracted capacity reports;
- Publishing case studies; and
- Enhancing the connection application and the wayleaves/consents processes.

DNOs publish Distributed Generation 'Work Plans' that outline progress against improvement initiatives. Check your DNO's Distributed Generation web pages.

Getting Connected — Energy Storage

Storage devices for electrical energy are becoming more prevalent, and can be used as part of Distributed Generation schemes to allow generated electricity to be stored within the premises rather than exported to the distribution network. **DNOs treat storage as demand when its importing from the distribution network and generation when its exporting to the distribution network**, and need to be aware of storage because of the potential impact on their networks. Therefore storage needs to meet the relevant connection requirements (EREC **G83/G98** or **G59/G99**).

If you are planning to use storage in conjunction with PV (**or other technologies**) to offset consumption, the total connected generation is likely to be above 16A / phase and **G59/G99** applies. However, **DNOs** have implemented a fast track application process, for domestic scale storage. This typically takes the form of an online **application** and reduces the **time for the DNO to provide confirmation that the connection is acceptable** from 45 days to 10 days or less. If the storage is intended to be operated in island mode (during a power outage) the fast track process is not applicable and the standard **G59/G99** process applies.

Getting Connected — IDNO's Networks

The process for connecting your Distributed Generation to an IDNO's network follows EREC **G83/G98** or **G59/G99**, and is therefore similar to connecting to a DNO's network. IDNOs are licensed entities and are bound by some of the same licence conditions as DNOs, including certain performance standards such as timescales for responding to requests for quotes. The majority of what is included in this guide applies to both DNO and IDNO connections.

However, there are a few key differences for a Distributed Generation connection to an IDNO network:

- **Provision of Information:** IDNOs have a reduced set of licence conditions compared with DNOs, and they are not obliged to provide the same documents for customers. IDNOs are not required to produce Long Term Development Statements nor Connection Charging methodologies and statements.
- **Interaction between the IDNO and the DNO:** When an IDNO receives an application for connection for Distributed Generation, they need to get approval from the DNO before they can offer to

connect you. If your generation project would cause certain network parameters to exceed defined limits, such as voltage or export to the DNO network, the IDNO and DNO will explore options for accommodating your project. This discussion will take place between the IDNO and the DNO, and will not involve you directly. However, the IDNO may then discuss different options with you for the most appropriate generation project to be connected.

- **Formal Agreements:** IDNOs will not necessarily insist on the same set of formal agreements that the DNOs will. Agreements such as the connection and adoption agreements may not be required.

To determine whether you are connected to a DNO or IDNO network, refer to the guidance on page 15 in the G59 full guide.

Where to Find More Information

If you want to find out more, these documents are particularly relevant:

- [Engineering Recommendation G99](#), Requirements for the connection of generation equipment in parallel with public distribution networks on or after 17 May 2019. **This can be downloaded via the [DCode](#) as well as ENA website.**
- [Engineering Recommendation G59](#), relating to the connection of generating units to the distribution systems of licensed Distribution Network Operators— **available to download via the [DCode](#) as well as ENA website.**
- [Electricity Safety, Quality and Continuity Regulations \(ESQCR\) 2002](#), Section 22: Statutory Instrument Number 2665, available free of charge.
- Ofgem’s information about [how to get an electricity connection](#) for a new building or site.

Some DNOs have produced their own guidance notes for small scale generation connections - check your DNO’s website.

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 27th 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 27th April 2019 must connect under EREC G99.

Fair and Effective Management of DNO Connection Queues: Treatment of Changes to Connection Requests

The ENA Distributed Energy Resources (DER) Connections Steering Group published a consultation in response to Ofgem’s strategy to create more efficient ways to connect to the distribution network. It specifically addresses concerns that when small changes are made to connection requests, they are treated as new requests and moved to the back of the queue. This can impact project timescales, costs and the network capacity available. The purpose of this consultation document is to bring further clarity about the concept of ‘allowable change’. The proposals aim to provide DNOs with a clear and consistent approach when considering change requests to a current project. DNOs are aiming to publish their position during 2018. More information is available [here](#).

Health and Safety considerations

Safety is very important in the design of generation connections. Some of the safety requirements for Distributed Generation connections are set out in EREC G59. This document references the Regulation that informs these requirements, the Electricity Safety, Quality and Continuity Regulations (ESQCR) 2002, and also lists the relevant British Standards.

You can find out more about Health and Safety aspects of Distributed Generation connections on the following websites:

- The Electrical Safety Council (ESC): www.esc.org.uk
- The Energy Networks Association—Safety, health and environment: www.energynetworks.org/electricity/she/overview.html

D. The Connection Application: Connection Application Process

In this section:

- How to apply to your DNO for connecting generating units
- Details of the connection offer that the DNO will produce for your connection
- How to notify the DNO that your generating unit(s) has been installed and commissioned in accordance with EREC G59

Introduction

This section of the Guide describes the application process for the connection of your generating units to the distribution network. This includes the application for connection form, and the connection offer from the DNO.

This section also explains the notifications which the installer of your equipment will need to give to your DNO once the units are commissioned.

This section is written for installations where:

- the equipment to be installed is type tested according to EREC G59 or G83; and
- the generating capacity of the generating units is at 50 kW or less three phase, 17 kW or less single phase.

If this does not apply to your installation, please refer to the section at the beginning of this guide entitled “Distributed Generation Connection Guide: Is this the right Guide for my project?”.

The Application for Connection Pro-forma

There is an ‘Application for Connection’ form included in Appendix 13.5 of EREC G59, available from the [ENA website](#). This form is intended specifically for generating units which are type tested and with an installed capacity of 50 kW or less.

This form is significantly simpler than the form required for larger generating units. It requires information about the site, any existing generation on the site, and some simple details of the equipment you are intending to install.

You or your installer should submit this form to the DNO **before any generation equipment is installed**, as the DNO needs to assess the possible impact of your generating equipment on the distribution network.

When the application has been submitted to the DNO, they will assess the impact of the generation on their network. Where necessary, they will carry out design work, eg. for network reinforcement. This will be detailed in your Connection Offer.

The Connection Offer

The Connection Offer that you will receive from your DNO should contain a number of key pieces of information. These include:

- details of the equipment and works needed to connect your generating units to the distribution network;
- information about any works needed to extend or reinforce the DNO's network as a result of connecting your generating unit to the system;
- any technical and commercial terms which will apply for the DNO to construct the connection and provide Use of System services to the developer;
- Any other useful information such as whether the DNO will need to witness commissioning of your units.

The offer will also contain details of the costs for the DNO to undertake any work. Further information about these costs is given in Section E: Costs and Charges.

You will have a defined period specified in your Connection Offer within which to accept the offer. This will typically be in the range 30-90 days. Make sure you are aware how long your acceptance period is, as this can vary across DNOs. There is no guarantee that once a connection offer is lapsed that a similar offer can be made again.

Connection Offers may also be withdrawn if the DNO feels that your plant is not progressing at a reasonable rate. This may be measured by progress against milestones set out in your Connection Offer. This is to prevent spare capacity being 'reserved' for projects that in practice are not actually being built. Your DNO may specify reasonable milestones to be met to prove the progress of your project.

It is possible that there will be other Distributed Generation in development in the same area of the network. If this is the case, your application may affect, or be affected by, another connection application. In this case all the relevant applications are referred to as "interactive". The DNO will tell you in writing if your connection application is interactive with one or more others. The Connection Offer will also specify that it is interactive with other applications.

Interactive connection applications are considered on the basis of 'first come first served'. The DNO uses the date and time that your Connection Application was made to put your Connection Offer in priority order compared to other applicants. For more information on interactive applications, see the full EREC G59 Guide.

The Commissioning Pro-forma

Commissioning should take place once the installation and connection is complete (or in the case of a phased installation, when the phase is complete). The tests and checks required for commissioning in the case of type tested equipment are described in section 12.3 of EREC G59.

The results of the commissioning should be recorded on the '**Generating Plant Installation and Commissioning Confirmation**' form, which is included in appendix 13.2 in EREC G59, available on the [ENA website](#).

The Commissioning Pro-forma

You or your installer should fill out this form, and sign the declaration at the bottom. The information required includes:

- details about the **site** where you are connecting your generating unit, including metering information;
- **contact details** for the installer/owner of the generating unit;
- **technical information** about the generating unit itself, including the generating capacity, type test reference and primary energy source;
- details of the **installer** of the generating unit, including the party's accreditation and qualifications;
- **supporting information**, eg. circuit diagrams; and

- a **signed declaration** as to the compliance of the generating unit with the requirements of EREC G59.

A commissioning pro-forma is required for each generating unit.

The 'Generating Plant Installation and Commissioning Confirmation' form must be submitted **within 28 days of the date of commissioning** (including the commissioning day itself). If the DNO witnesses the installation, then the form can be filled in on the day and handed to the DNO representative.

Other Requirements

The declaration that your installer signs on the Commissioning Pro-forma requires them to confirm that they've installed your generating unit in accordance with EREC G59. It's important that you use an installer who is familiar with the requirements of these

standards. If you appoint a competent installer (see Section C: An Overview of Getting Connected), they should know about these standards and make sure that your installation meets with all the relevant standards.

E. Cost and Charges: Overview of Charges

In this section:

- An introduction to connection costs
- The basis of DNO connection charges for infrastructure
- Other elements of connection charges and where to find indicative costs and examples
- Generation Distribution Use of System charges and metering arrangements

Tip: Read the boxes for definitions or explanations of terms that may be new or unfamiliar.

Introduction

There are two categories of charges made by the DNO:

- **Connection charge:** this is a one-off charge made by the DNO, which primarily covers the cost of work and equipment associated with connecting your generating project to the distribution network. This includes a portion of reinforcement costs.
- **Use of System charges:** these are ongoing charges, which primarily cover operation and maintenance costs and include an element to cover the costs of ongoing network development including general reinforcement.

DNOs are obliged to publish documents describing the basis of their connection charges and their charging methodology. They also present the different elements of connection charges, and indicative costs for works and equipment of significant cost. This will help you to understand the charges they quote you. This information is contained in the DNOs Statement of Methodology and

Charges for Connection to the electricity distribution system. All DNOs' statements follow the same format, and are available on their websites. This document contains:

- The DNO's connection charging methodology (ie how they calculate their charges);
- The DNO's connection charging statement (ie what the charges are);
- An indication of the costs of providing a connection quotation / budget estimate; and
- Other relevant information for connecting customers.

The basis and elements of connection charges, as well as indicative costs and examples are discussed in this section.

Use of System charges are levied by the DNO on the supplier, so as a generator you will not be charged these directly. However, this section is included for your information, as Use of System charges may appear as an item on your bill.

Connection Charges—Infrastructure

Depending on the location and size of your generating units the DNO may have to modify an existing part of the network to accommodate your project. Reinforcement work may be required to increase the electrical capacity of those parts of the network which form part of the electrical path from the generating units to the network. The connection charge includes a **portion** of reinforcement costs.

DNOs are obliged to publish a document describing the basis of their connection charges and their charging methodology. You can refer to this document to see what portion of reinforcement costs you will be charged for. These are available on DNO websites.

Connection Charges—Other Elements

Elements of charges

As well as charges for the reinforcement, there are other elements that are covered in the connection charge. These can include the following:

- System / feasibility / fault level studies
- Provision of Wayleaves
- Additional meetings with the DNO or site visits
- Administration

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.

Indicative costs and examples

Equipment costs and charges for services vary across DNOs; it could therefore be misleading to list indicative costs in this Guide. If you want to get an idea for indicative costs, the best place to look is the **DNO's Statement of methodology and charges for connection**. You can find this on the DNO's website.

Aside from giving indicative costs for connection charges, these documents typically contain other useful information, including guidance on the connection process and examples of various connections and their associated cost breakdown. It is updated annually.

The connection charging methodology is governed by the Distribution Connection and Use of System Agreement (DCUSA) and is subject to open governance so any party materially affected by it can propose a change to it. The process for doing this is laid out within the DCUSA itself. See the DCUSA website for more information:

www.dcusa.co.uk

[The Distribution Charging Methodologies Forum](#) exists to enable parties to discuss ideas for improving the methodology possibly prior to submitting a formal change proposal.

Estimating costs and getting a quotation

As mentioned, you can obtain indicative costs for works and equipment from DNO documents. To obtain a more accurate picture of the connection costs for your project, you can:

- Ask the DNO for a budget estimate
- Obtain an estimate of connection costs from a specialist engineering consultant

You should exercise care in interpreting budget estimates. DNOs use reasonable endeavours to identify remote reinforcement costs associated with the proposed connection at this stage. However, it is possible that not all of the reinforcement costs will be included at this time.

Connection Charges—Other Elements

Payment of connection charges

Connection charges are paid either:

- in full at the time that the connection offer is accepted; or
- in staged or phased payments, as per a payment schedule.

Staged payments are typically used for generation projects which are greater than a certain size, eg. in project value or duration. The staged payments cover committed expenditure by the DNO.

If your connection does not proceed, it is possible that some of the connection charge will be refundable depending on if the DNO has performed the work. You should inform your DNO as soon as possible if you decide not to go ahead with your project.

What is a budget estimate?

You may read about **budget** or **indicative estimates** and **formal quotations**. The differences between these two terms are summarised in the following table.

Budget or Indicative estimate	Formal quotation
Requested in the early stage of a project, and generally only for larger capital projects	Requested when electrical requirements have been finalised
The DNO doesn't require much information from you	The DNO requires a lot of information from you
Based on a desktop study—the DNO is unlikely to carry out detailed designs or studies	Based on detailed design work, and may require other input such as site surveys
To give an indication of costs, and is therefore subject to change	Provides formal contract offer
Not open for acceptance	Open to acceptance, subject to conditions
DNO may charge	DNO may now charge (see Assessment & Design fees)

Assuming that you ask the DNO to undertake all of the work involved in your connection, the timescale for the DNO to provide a budget estimate is 10 working days.

Use of System Charges

Use of System (UoS) charges cover operation, repair and maintenance of network assets, and also any reinforcement to the network that might be necessary that is not covered by the connection charge.

All generators with equipment connected at LV and HV are subject to UoS charges under the Common Distribution Charging Methodology (CDCM). Generators with equipment connected at EHV are subject to UoS charges under the EHV Distribution Charging Methodology (EDCM).

These charges can be negative for generation (ie credits). Please see the table **below** for definitions of the terms LV, HV and EHV.

DNOs are obliged to publish documents about their UoS charges. These cover their UoS charging methodology and a statement of what the charges are for both generation and demand customers. You can find these on DNOs' websites.

You can find out more about the Common Distribution Charging Methodology (CDCM) and EHV Distribution Charging Methodology (EDCM) from DNOs' websites, [Charging Arrangements](#) section on Ofgem website, and [Charging Methodology](#) section on the Energy Networks Association website.

Connection Offer expenses (Assessment and Design fees)

Following a recent government consultation, BEIS is now allowing DNOs to charge Connection Offer expenses (also known as Assessment and Design fees), regardless of whether or not the subsequent Connection Offer is accepted. Connection Offer expenses are a charge by the DNO for the cost of producing Connection Offers, and cover activities such as network modelling, connection design and site surveys. DNOs may apply these charges from April 2018. For further information on the recent consultation, refer to the [BEIS website](#).

Note that DNOs are applying these charges differently. For example, some are only applying them to projects with certain connection voltages. Refer to your DNO website for details on how they are applying the charges.

Definitions of LV, HV and EHV

Term	Voltage level
LV (Low Voltage)	In general: less than 1 kV. In practice, this means 400/230 V
HV (High Voltage)	In general: 1 kV—22 kV. In practice, this means 6.6, 11 or 20 kV.
EHV (Extra High Voltage)	In general this covers connection to the distribution network at or above 22 kV. In practice this means 33 or 66 kV, (or 132 kV in England and Wales only). Some DNOs may define this slightly differently. See the definition of EHV for your local DNO.

Metering Requirements, Parties and Charges

Metering requirements

You may require separate meters for measuring your import and export. There are two categories of meter:

- Half Hourly (HH)
- Non-Half Hourly (NHH)

They are described in the box on the next page.

The type of meter will affect:

- the meter charges you pay; and
- what category of UoS charges apply.

Section L of the Balancing and Settlement Code (BSC) dictates the type of meter you will require. If you are classed as a 'Small Scale Third Party Generating Plant' (currently defined as less than 30kW capacity), you can choose to have a NHH meter. Otherwise, you have to have a HH meter, if metering export.

HH meters can provide metering data for each half hour period, and so can be useful for understanding your electricity import or export at different times of the day. However, they have significant costs associated with them.

Parties involved

NHH meters are the responsibility of the supplier. They will appoint the following Supplier Agents:

- Meter Operator: installs and maintains the meter
- Data Collector: retrieves the data recorded by the meter and calculates your actual or estimated volume of energy consumption
- Data Aggregator: sums up volumes of energy consumed for each supplier and sends the information to a central system for balancing and settlement

You can choose to contact your supplier about the provision of meters, or contract directly with a Meter Operator. If you use HH metering, it is your responsibility to appoint a Meter Operator. You will have to enter into a Meter Operator contract with a meter supplier. The contracts normally last for five years, and the Meter Operator will:

- Provide, install and maintain your meter; and
 - Collect data from your meter via a communications link such as a telephone line
- the provision of meters is open to competition. Details of Meter Operators and their contact details can be found on the Association of Meter Operators website:

www.meteroperators.org.uk

There are Codes of Practice which detail technical requirements for Metering Systems. These can be found on [Flexon's website](#).

Charges

The cost of Meter Operator agreements and the costs associated with the communication to collect data from your meter can be in the order of several hundred pounds a year. You should consider obtaining quotations from a number of Meter Operators.

Note: in practice suppliers may pay the owner of some smaller Distributed Generation a fixed amount (eg. £/year) instead of installing meters and making payments based on units exported. This is something you can discuss with your supplier.

Metering Requirements, Parties and Charges

Half Hourly (HH) meters and Non-Half Hourly (NHH) meters

Meters record the flow of electricity. There are two main categories of meters; Half Hourly (HH) and Non-Half Hourly (NHH). HH meters are for larger customers; if your generation peak power is greater than 30 kW you have to use a HH meter, if metering export.

NHH meters record total energy passing through the meter, but do not record the times the energy is transferred. Typically the recorded data would be collected a few times a year, eg. every quarter. In contrast, HH meters measure and record energy passing through the meter for each half hour period. The data they record is typically collected remotely every day, for example by a telephone line.

Data from meters is used to determine charges and rewards. For example, to calculate:

- Imbalance charges for balancing and settlement
- Distribution or Transmission UoS charges
- Renewables Obligations Certificate rewards

Ofgem Targeted Charging Review

Ofgem is reviewing certain elements of Transmission and Distribution Use of System charges, in a Targeted Charging Review (TCR) Significant Code Review (SCR). This is because they have concerns that the current framework for charging may result in inefficient use of the networks and unfair outcomes for consumers. The review was launched in August 2017. Ofgem is planning to consult on possible options in summer 2018. See [Ofgem's website](#) for the latest information.