

wellington
electricity™



Distributed Generation (>10kW) Connecting to Wellington Electricity's Network

**Important information about installing
distributed generation with
capacity of greater than 10 kilowatts**

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1. Purpose of this document:

This document provides a brief outline of the process for installing distributed generation with capacity of greater than 10 kilowatts on Wellington Electricity's electricity network. Its purpose is to provide the prospective generator with the key aspects involved when connecting distributed generation to Wellington Electricity's electricity networks, and is not intended to be a comprehensive handbook.

This document is to be read in conjunction with the following Wellington Electricity documents:

- Technical Requirements for Connection of Distributed Generation
- Distribution Code
- Initial Application Form for Connection of Distributed Generation (>10kW)
- Distributed Generation Connection Agreement Template

These documents are available at Wellington Electricity's website www.welectricity.co.nz

Each distributed generation situation is different and needs to be discussed with a Wellington Electricity representative. For further information about distributed generation, please call (04) 915 6100 or email WE_Enquiries@welectricity.co.nz

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3. Distributed generation setting the scene

- Installation of distributed generation can be a complex matter and for connections greater than 10kW you need to involve Wellington Electricity from the early stages in your investigation process. The sooner you involve Wellington Electricity, the more informed you can be and the smoother the process can run.
- Connection of distributed generation to an electricity network has a wide range of implications. This includes personnel and public safety, network performance, service quality, investment in the network, and commercial agreements.
- If your generation is to be connected to Wellington Electricity's network for excess energy export (injection) purposes, then it must comply with Wellington Electricity's requirements for connection of distributed generation to our network.
- The electricity you may sell from your distributed generation system is distributed on the network of your lines company. Wellington Electricity is the lines company for the Wellington region including the main centres of:
 - Wellington City
 - Lower Hutt City
 - Upper Hutt City
 - Porirua City
- If your generation will be for isolated localised operation only ("islanded" within your own private network) and you have no requirements to export any excess energy, this document is not applicable to you. **This requires your generation system to be physically isolated from Wellington Electricity's electricity network.**

4. For further information

When you decide to install distributed generation, you want to do it right. We want you to do it right too. If you have any queries or need more information after reading this document, please contact us:

Phone Number: **+64 4 915 6100**
 Address: **CAPEX and Connections Manager
 Wellington Electricity Lines Limited
 PO Box 31049
 Lower Hutt 5040
 Wellington**
 Email: **WE_Enquiries@welectricity.co.nz**
 Website: **www.welectricity.co.nz**

5. Implications of connecting distributed generation

Historically, distribution networks have been designed for the distribution of electricity from the national grid to consumers, and have not been designed to allow injection of electricity mid-network. As a result the health and safety, technical, and commercial implications outlined below can occur.

7.1 Health and safety implications

The connection of distributed generation requires safety equipment and procedures to be put in place to ensure safe interaction between your private network and Wellington Electricity's electricity network. If not managed correctly, it is possible for your generation system to backfeed electricity onto our network which could endanger the lives of Wellington Electricity personnel and the public.

For everyone's safety your generating system must also meet statutory requirements, comply with international manufacturing standards and safety standards specified by Wellington Electricity. **Wellington Electricity maintains the right to disconnect any site found to be unsafe, and shall not reconnect the site until it is approved safe.**

Please respect these standards and remember this first rule for safety:

Check with Wellington Electricity first!

For everyone's safety, you must check with Wellington Electricity before installing or connecting your distributed generation system.

7.2 Technical implications

The effect of connecting a distributed generator to our network requires detailed investigation and discussion with Wellington Electricity. Depending on the particular situation, the connection of your generation may require the reinforcement of the existing network.

Technical aspects to be discussed include:

- Safety requirements
- Connection capacity requirements
- Protection and control requirements
- Synchronisation between networks
- Fault current
- Islanding
- Black start capability (mainly for larger generation stations)
- Power quality
- Reactive power compensation
- Other aspects relevant to individual situations

7.3 Commercial implications

Connection costs

Connecting your distributed generation system to Wellington Electricity's network will require us to install additional connection assets. Dependent on your specific connection, there may also be other network reinforcement and/or investment costs. Wellington Electricity will pass these associated costs on to you.

Ongoing costs

Wellington Electricity may charge for ongoing expenses incurred because of your distributed generation connection to our network. Where we incur ongoing or periodic expenses, such as expenses for routine maintenance, we may apply a connection charge to help cover these costs.

The charges and associated commercial terms need to be individualised for each generator and will be formalised in a 'Distributed Generation Connection Agreement'. A template version of this agreement is available to download from Wellington Electricity's website.

7.4 Other implications and considerations

Timing of installation

The connection of distributed generation to our network can be complex and may require detailed design and planning. Approval for this must be obtained from Wellington Electricity prior to connection so you will need to factor this into your timeframe.

Metering

Your electricity retailer may need to install a new meter. This new meter will be able to measure the amount of surplus electricity that you generate and sell back.

An import/export meter is the minimum requirement for use with distributed generation systems. An import/export meter has the capability to measure both imported and exported volumes of energy. This ensures you receive the correct payment for the electricity you contribute to the electricity retailer and that you are charged correctly when you use electricity supplied by the retailer.

There may be extra rental costs for this type of meter and your electricity retailer will advise you about these. You may also have to pay your electricity retailer a tariff or meter change fee, depending on your location and your current metering configuration.

Wellington Electricity's network information systems

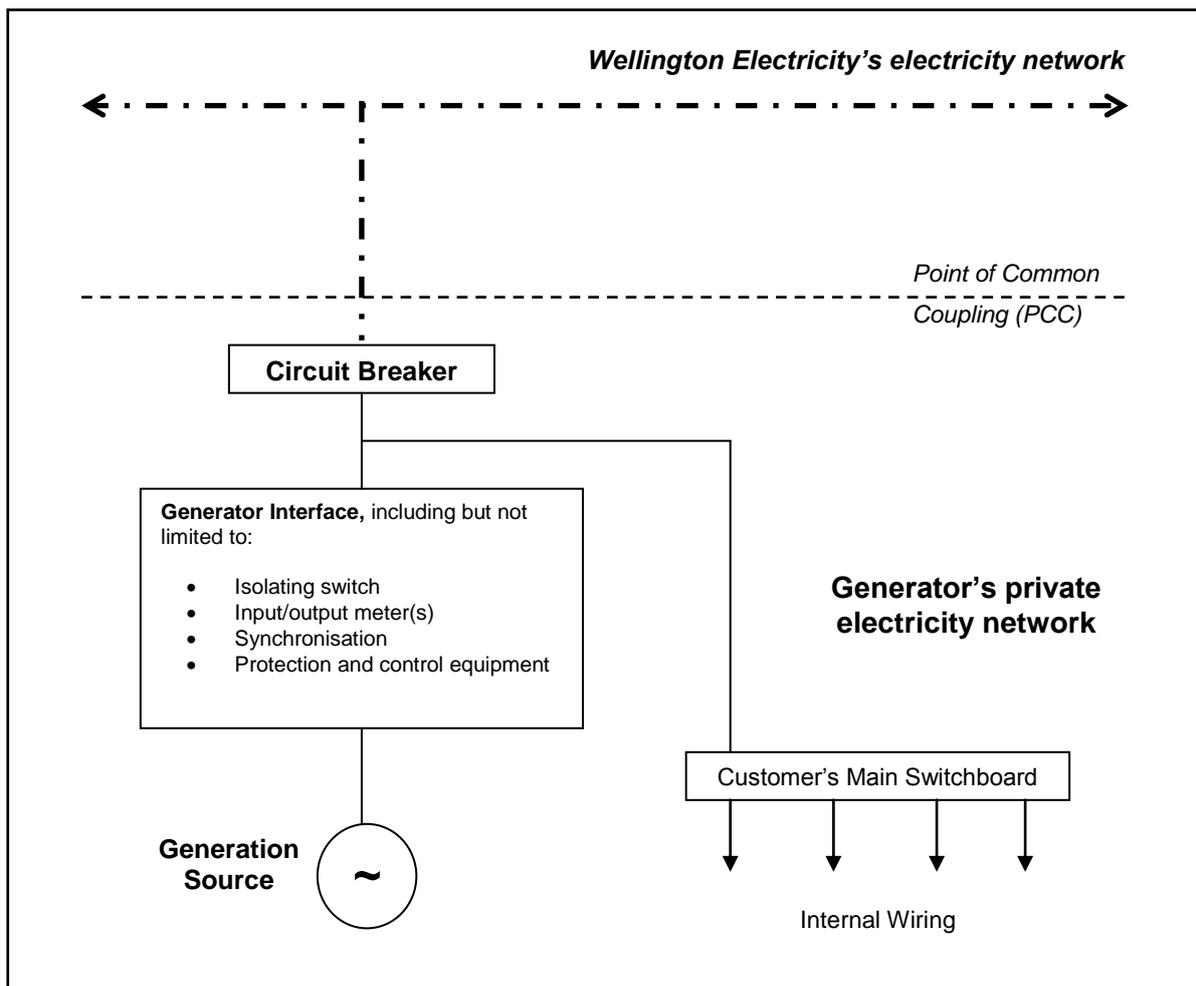
Wellington Electricity keeps comprehensive information systems for its networks. These will need to be updated to include your generator system details.

Energy retailing/trading

As a generator you are required to have a sale/purchase agreement with an electricity retailer. Further information can be found by contacting your specific electricity retailer. The requirements for generators to trade electricity on the electricity market are covered in the Electricity Industry Participation Code, Part G.

7.5 'Typical' generator connection diagram

The following is a generic representation of a typical distributed generation connection. Each installation is different and needs to be discussed with Wellington Electricity.



6. Technical Standards to be met

The following is a summary of Wellington Electricity's standards that must be met, and are available to download as documents from Wellington Electricity's website:

- Distribution Code
- Technical Requirements for the Connection of Distributed Generation (DG)

The following is a summary of the key industry standards that must be met:

- IEC Standards
 - IEC 60255 Electrical Relays
 - IEC 60068-2 Environmental Testing
 - IEC 61000-4 Electromagnetic Compatibility
- IEEE Standards
 - IEE 519-1992 Recommended practices and requirements for harmonic control in electrical power systems
 - IEEE 929-2000 Recommended practices for utility interface of Photovoltaic (PV) systems
- Electrical Codes of Practice
 - Available at the Energy Safety Service (ESS) website www.ess.govt.nz/rules/rules_codes.asp
- AS/NZS Standards, in particular:
 - AS/NZS 3000 – Electrical Installations (known as the Australian/New Zealand Wiring Rules)
 - AS/NZS 3010 - Electrical Installations - Generating Sets
 - AS 4777 provides standards for connecting inverter-based systems, but is also a useful guideline to installing other forms of generation.
 - These standards are available at www.standards.com.au

Other standards may be applicable depending on your generation system, and these need to be discussed with Wellington Electricity.

7. Important steps to connecting Distributed Generation

9.1 Read Wellington Electricity's distributed generation documents

Please familiarise yourself with the documents available on Wellington Electricity's website. If you do not have access to the website, contact Wellington Electricity to request a copy of these documents:

- Technical Requirements for Connection of Distributed Generation
- Distribution Code
- Initial Application Form for Connection of Distributed Generation (>10kW)
- Distributed Generation Connection Agreement Template

9.2 Initial Application to Wellington Electricity

Our process for connecting distributed generation is governed by regulation. As part of this process, we will need you to complete our application form. This is available on our website. Please ensure you complete this application form correctly, and include your application fee, otherwise we will return your application form to you.

If you have any other information that may help us with your application, please also include this with your application form. Further details about our contact details and application fees are available in Section 10 of this document.

9.3 Wellington Electricity to discuss with you

A Wellington Electricity representative will contact you to discuss your initial application. We will then highlight any potential issues and provide information about our particular connection requirements.

Key aspects Wellington Electricity will want to discuss:

- Proposed location of your generator
- Specifications of your generator
- Proposed schedule for connection to the network
- Proposed design and installation contractors for your generator
- Technical implications of connecting your generator
- Commercial implications of connecting your generator
- Planning and scheduling
- Companies that will be involved in the design and installation process

9.4 Design in conjunction

Once we have discussed the effects of your proposed generation installation, further investigation and design work needs to be undertaken by both Wellington Electricity and your

representatives. Ongoing discussion needs to occur to ensure the design process goes smoothly and an acceptable outcome is reached.

9.5 Installation of generation

Once you have finalised your installation design, Wellington Electricity will require a design review before approving connection of your system to our network. You must use a suitably qualified installer (a Registered Electrician or Certified Contractor) to install your generator and electrical wiring. You must send Wellington Electricity a copy of the Certification of Compliance (CoC) that your installer must provide to you on completion.

9.6 Final application and approval to proceed

When you are ready to connect to Wellington Electricity's network you need to notify Wellington Electricity that you wish to proceed. We can then organise your final connection to our network.

You must have obtained and provided to Wellington Electricity:

- Certificate of Compliance (CoC)
- Sale/Purchase Agreement with an Electricity Retailer
- Distributed Generation Connection Agreement
- Payment for connection related costs
- Operating procedures
- Contact details and procedures
- All other information requirements
- All relevant information to allow us to update our network records
- Proposed connection schedule

Prior to connection any network reinforcement projects must be completed (if required to allow connection to the network).

A connection agreement will be negotiated between Wellington Electricity and yourself within 30 business days of receipt of your notice to proceed. This period can be extended by mutual agreement. If we cannot conclude a connection agreement within the agreed time, you will be connected as soon as is practical on the terms prescribed in Part 6 of the Electricity Industry Participation Code 2010.

9.7 Connection to Wellington Electricity's electricity network

Once Wellington Electricity is satisfied that your generation system is compliant with all Wellington Electricity and industry standards and requirements, connection to Wellington Electricity's network can be organised.

Final connection to Wellington Electricity's network will require:

- Final system/site inspection and approval by a Wellington Electricity representative. Applicable fees for this are outlined below.
- Connection to the network by a Wellington Electricity approved contractor.
- Update of Wellington Electricity's Information Systems.

8. Fees

Upfront application fee

It takes time for Wellington Electricity to analyse and review the information that you provide. Wellington Electricity will charge an initial application fee to help cover our costs. The application fee varies depending on the size of your connection and will be charged as follows:

Connection size	Application Fee
>10kW and <100kW	\$500*
≥100kW and <1MW	\$1,000*
≥1MW	\$5,000*

* In accordance with Part 6 of the Electricity Industry Participation Code 2010

Please ensure that you send your application fee payment in with your initial application. If you do not send this in, your application may not be accepted.

On-site observation and testing fee

Depending on the installation, Wellington Electricity may require a site visit and inspection to ensure that we are satisfied with the installation. If Wellington Electricity requires a site visit, we will charge a nominal fee to help cover the expenses we incur. These charges are as follows:

Connection size	Inspection Fee
>10kW and <100kW	\$120*
≥100kW	\$1,200*

* In accordance with Part 6 of the Electricity Industry Participation Code 2010

All cheques should be made payable to "Wellington Electricity Lines Limited".

9. Useful Links

Wellington Electricity

www.welectricity.co.nz

Distributed Generation Information

http://www.welectricity.co.nz/network/Pages/distributed_generation.aspx

Electricity industry:

The Electricity Commission

www.electricitycommission.govt.nz

The Ministry of Economic Development (MED)

www.med.govt.nz

Electricity Networks Association (ENA)

www.electricity.org.nz

Further links:

Please refer to the Wellington Electricity website for further industry related links

<http://www.welectricity.co.nz/links/Pages/default.aspx>

Government Regulations:

Part 6 of the Electricity Industry Participation Code 2010

<http://www.legislation.govt.nz>