

Connecting your home or small business generation

For connections
15kW or less



Orion

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Introduction to small distributed generation systems—15 kilowatts or less

Distributed generators, also known as ‘embedded generators’, are located at a home or business to produce electricity for that home or business’s own use. They may also be capable of putting surplus energy back into Orion’s distribution network. These generators can take several forms: solar panels, wind or micro-hydro turbines and diesel generators are the most common.

If you are interested in operating distributed generation and connecting it to our network, there are some things you need to know.

This guide contains information for people interested in connecting small distributed generation systems, 15 kilowatts or less, to our network.

Systems of this size are typically installed in homes and small businesses whereas systems greater than 10 kilowatts are typically used by larger businesses.

Who is this information for?

This information is for people who want to connect small distributed generation systems, 15kW or less, to Orion’s electricity network to generate electricity and possibly export energy into our network. These systems are usually single-phase, but may be three-phase.

This information does not apply to generation systems which are not connected to our network.

For information about connecting larger distributed generation, see our guides to Connecting your business solar generation or Connecting your business diesel generation. These guides are available on our website.

Your proposed distributed generation system

If you intend to install distributed generation that will be synchronised with our network, you will need to involve us in the process as early as possible.

The number of small distributed generation systems being connected to our network is increasing rapidly. At the moment the additional energy being injected into our network is not causing network congestion. However there is potential for multiple distributed generation systems in the same area to increase voltage levels and damage your electrical equipment, your neighbours’ or our network.

Our Congestion Management Policy on page 6 outlines how we will manage future congestion from small distributed generators.

Distributed generation must meet all relevant statutory and regulatory requirements and comply with all applicable safety standards. If you connect distributed generation to our network, safety equipment and procedures must be in place to ensure safe interaction between your distributed generator and our network.

More information about distributed generation is available on the Electricity Authority Te Mana Hiko website:

www.ea.govt.nz

Alternatively, you can contact:

Gavin Bonnett
Connections Futures Team Lead

DDI: 03 363 9731

Mobile: 027 474 7665

Email: generator.application@oriongroup.co.nz

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The process for connecting your system to our network

We outline below the steps that you will need to take to connect distributed generation of 15kW or less to our network. This information complies with the Electricity Authority, [Electricity Industry Participation Code 2010 Part 6, Connection of Distributed Generation](#) ("the Code").

Select your system

Usually distributed generation of 15kW or less will be solar powered—photovoltaic panels. Less frequently, it will be wind or micro-hydro generators.

These guidelines are for distributed generation systems that connect to our network via an inverter. If you want to connect a system to our network without an inverter, please talk to us.

If your distributed generator connects to our network via an inverter, the inverter must conform to the relevant standards, AS/NZS 4777, which you can purchase and download from standards.org.au or view for free at your public library. While these standards have been created with solar powered systems in mind, they can be applied to other systems.

You can speed up the processing of your application to connect to our network by using a distributed generation inverter that conforms to the AS/NZS4777 standard and is pre-approved by Orion. Our [website](#) shows currently compliant inverters (updated quarterly).

Contact your electricity retailer

You must discuss your intended distributed generation installation with your current or proposed electricity retailer, as any surplus energy that you generate may be sold to them.

Notify us

At the current levels of connection, small domestic generation systems, typically about 3kW output, are unlikely to have significant impacts on our network. However we need to know where they are connected for safety and administrative reasons. Ideally, you should contact us as soon as you have decided which system you intend to install. The impact of small generation systems increases when several systems are located in close proximity.

Your application

You will need to complete the [online application](#) form and submit it, with all the detailed information requested in the form.

It's important that the inverter you are intending to install complies with the AS/NZS 4777 standard. If your proposed inverter is not on our list of currently compliant inverters you will need to provide a copy of the Supplier's AS/NZS 4777 Declaration of Conformity. The Declaration of Conformity proves that the inverter has been type-tested as complying with all relevant parts of AS/NZS 4777 by a laboratory with accreditation issued or recognised by International Accreditation New Zealand.

Application acceptance

We will confirm the receipt of your application within two business days and once payment has been received we aim to approve applications involving compliant equipment in writing within five business days. You must not connect your distributed generation system to our network without our approval.

If, for any reason, you do not receive feedback on your application from Orion within two business days, please contact us. Under New Zealand's regulations, if your application includes an AS/NZS 4777 compliant inverter, and we do not approve your application within 10 working days, then it is deemed to be accepted. It's important that we have a record of all distributed generation installations, so please contact us to receive formal approval.

Application fee

An application fee of \$92 (incl. GST) applies. Payment is required with applications.

Payment can be made by direct credit, to our bank account 03-0855-0345995-03. When paying by direct credit please quote the ES reference from the online application together, with the house number and street name of the premise where the distributed generation is to be connected. Please do not pay by cash.

If we decline your application

If we decline your application we will detail our reasons and the steps you can take to ensure your application will be successful, if you choose to make a new application. If you disagree with our decision, a dispute resolution process is provided in [Schedule 6.3 of the Code](#).

Connection of generation

Once your system has been installed, you are required to provide a copy of your Code of Compliance (COC) and a copy of the Record of Inspection (ROI) within ten working days.

Metering

You are required to have import/export metering, capable of measuring exported energy from the generator into our network, even if this seems unlikely. Your electricity retailer can arrange this for you.

Your retailer will advise of any rental charge for the meter, which may only be a few cents per day. You may also be charged a tariff/meter change fee, depending on your location and your existing metering.

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Installation

Any distributed generation equipment that you purchase should come with manufacturer's installation instructions. Installation must be undertaken by qualified tradespersons to ensure compliance with all relevant building and electrical codes and standards. All wiring associated with the system must be undertaken by a registered electrician, which complies with electricity safety regulations 2018 and AS/NZS 3000 or any successive standard or legislation. You must also check with your local Council whether any building or other consents are required.

If your generator continued to operate during a power cut, putting electricity back into our network, this would cause a serious safety risk to anybody working on our network at the time. Our crew could be electrocuted and your equipment could be damaged. To prevent this happening you are required to install a system manufactured to AS/NZS 4777 and with protection systems installed in accordance with the AS/NZS 4777.

Your registered electrician should closely follow AS/NZS 4777 when installing your equipment. This standard can be purchased and downloaded at standards.org.au.

While AS/NZS 4777 deals primarily with connection of inverter based systems, its principles should also be followed for distributed generation systems that do not employ inverters.

Export Limit

The maximum export phase imbalance shall not exceed 5kW. That is, for a single phase installation the export to the network shall not exceed 5kW. For two phase installations, the export to the network will be limited to 10kW evenly spread across the two phases. For a three phase system, the maximum export difference between any phase shall not exceed 5kW.

Export limit must be recorded on the COC for inspection.

Generation payments

Your retailer may credit you for the amount of electricity that you export into our network. We operate an export credit arrangement that retailers can optionally apply for which reflects the benefit of generation to our network and supports the payment of retail credits.

For the avoidance of doubt, any charges for power used (i.e. real load or reactive load) at the site is not covered under these distributed generation terms, and is instead subject to Orion's standard delivery charge basis set out in [Orion's Pricing Policy](#) and subject to change over time.

Additional information

For more information about your rights and responsibilities as the owner of a small distributed generation system see the [Regulated Terms for the Connection of Distributed Generation \(Schedule 6.2\) of the Electricity Industry Participation Code](#).

Congestion management policy

Distributed generation on our network has traditionally been installed by individual customers who wish to enhance the security of their electricity supply and reduce their costs associated with peak demand on our network.

The electricity generated has generally been used at the premises where it was generated and at a time coinciding with high network demand.

New forms of distributed generation, such as solar power, photovoltaic panels, are predominantly being installed to reduce the quantity of electrical energy required from the network on a continuous basis. This change in approach can lead to significant amounts of electricity being exported on to our local area network. This is particularly true in the height of summer when photovoltaic output is at a maximum and homeowners may be at work or away on vacation with very little electricity being used in the home.

Our network is mainly engineered so that electricity flows in one direction. Continued growth of distributed generation is likely to create reverse energy flows and congestion on some parts of our network. Typically this will create excessively high voltage, which can damage customers' electrical appliances as well as our network equipment.

At the moment small distributed generators are not causing any congestion on our network but we will continue to monitor this. We will undertake regular assessments, using our database of distributed generation installations and network capacity models, to determine what areas on our network will be congested with the addition of future distributed generation. We will report areas of distributed generation congestion on our network.

Distributed generation can be provided in many different forms, with wide variations in the business model and operational requirements. Congestion management is best determined on a case-by-case basis during the network application process. There are two main ways to manage network congestion:

- by ensuring that distributed generation connection only occurs in uncongested areas or is always accompanied by an appropriate network upgrade
- by agreeing on a case-by-case basis the real-time operational rules that will apply

The outcome will depend on the nature of the network congestion, the distributed generation operational characteristics and the business model of the proposal.

In line with the pricing principles in the [Electricity Industry Participation Code 2010 Part 6 Connection of Distributed Generation](#), in situations where a proposed generator will add to, rather than relieve, network congestion, and where this congestion requires reinforcement of the network, we will charge this to the connecting distributed generator.

Future updates to this congestion management policy will detail our approach to managing distributed generation congestion, including operational rules.

In some instances, events on Transpower's national transmission grid may restrict distributed generation.

Emergency response policies

Our emergency response policies are detailed in our Asset Management Plan, Section 6.9.1: List of Contingency Plans. Printed copies are available from our offices at 565 Wairakei Road, Christchurch 8053.

Safety standards

Our safety standards are detailed in our Asset Management Plan, Section 6.3: Safety, and Section 3.3.5: Service Level Measures - Safety. Printed copies are available from our offices at 565 Wairakei Road, Christchurch 8053.

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