

**Distributed Generation ($\leq 10\text{kW}$)
Connecting to Vector's electricity network**

**Important information
about installing distributed generation
with capacity of 10 kilowatts or less**

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What is distributed generation?

- You can generate electricity for your own use, while still being connected to Vector's electricity network and may be able to sell any surplus electricity you produce to an electricity retailer (Vector cannot purchase your electricity under government regulation). This is known as distributed generation.
- The electricity you may sell from your distributed generation system is distributed on the network of your lines company. Vector is the lines company for three regions:
 - **Auckland** (Auckland City, Manukau City and parts of Papakura District)
 - **Northern** (North Shore City, Waitakere City and Rodney District)
 - **Wellington** (Wellington City, Hutt City, Upper Hutt City and Porirua City)

NOTE: Vector operates its Northern and Wellington regions under the UnitedNetworks brand, but your query will be handled by a Vector representative.
- The following information applies to distributed generation. It does not apply to electricity generating systems that stand alone (known as islanded networks) and do not connect to Vector's networks.
- This information applies to distributed generation using a single-phase electricity generating system with maximum generation capacity of 10kW or less. It is likely to be installed in residential or small business premises. **For larger distributed generation systems, please refer to our documentation for distributed generation with a capacity of greater than 10kW or call (09) 303 0626.**

Generating and selling your own electricity - before you start

- Ensure that your distributed generation will not cause safety problems.
- You will need to arrange with your electricity retailer, who is authorised to trade on Vector's electricity networks, to purchase the surplus electricity you generate.
- You must use a registered electrician to install your distributed generation system and you will need to get an electrical Certificate of Compliance (COC).

The following information details the steps you must follow before installing or connecting your distributed generation system to Vector's network.

If you have any queries or need more information, please call (09) 303 0626.

Standards

There are various standards that you need to meet to be able to connect you to distributed generation. These standards are:

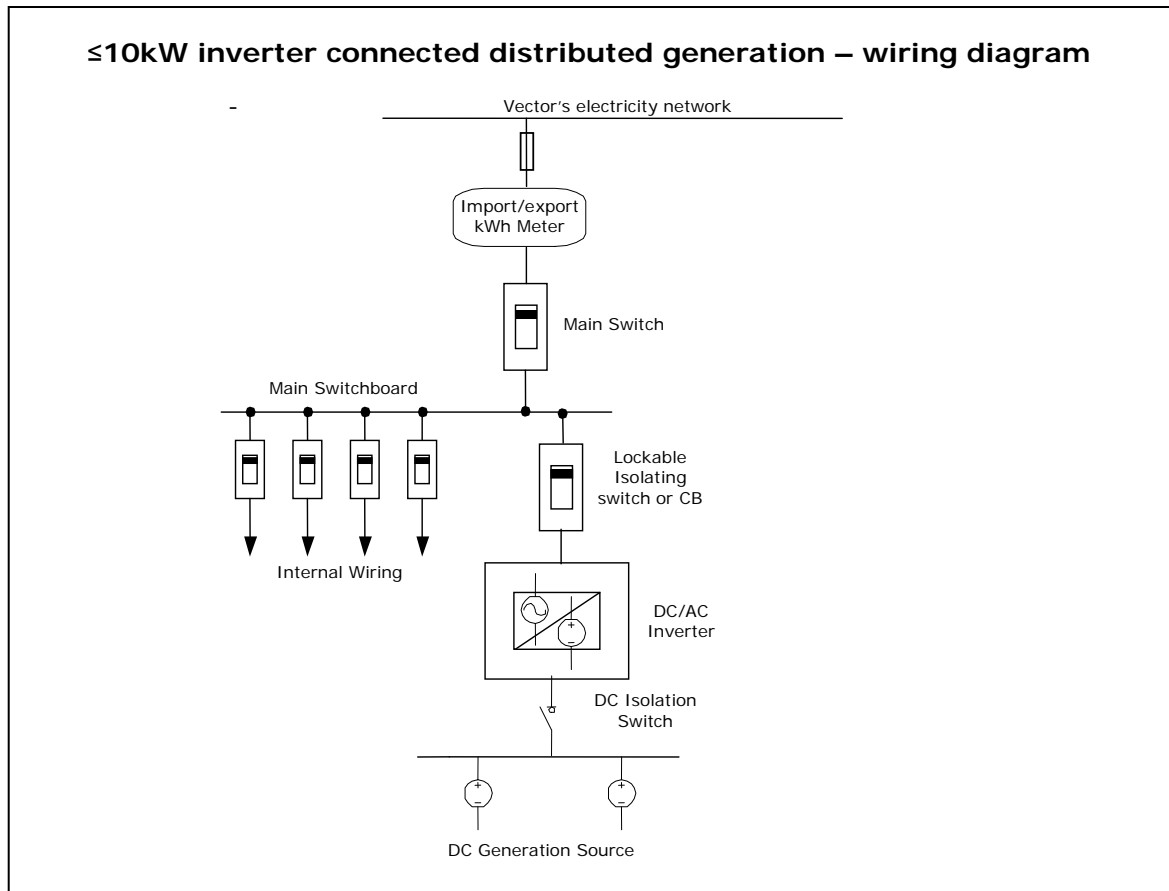
AS 4777.1	Grid connection of energy systems via inverters - Installation requirements
AS 4777.2	Grid connection of energy systems via inverters - Inverter requirements
AS 4777.3	Grid connection of energy systems via inverters - Grid protection requirements
AS/NZS 3000	Electrical installations (known as the Australian/New Zealand Wiring Rules)

These standards apply to small distributed generation where the system is connected to the electricity network via an inverter. Other standards will apply where the generator is connected directly to the network.

Copies of the relevant standards are available from www.standards.com.au

Specific Technical Requirements:

- The distributed generation system must have a lockable isolating switch or circuit breaker accessible by Vector's field service crews.
- The inverter unit must be sealed in such a way that the protection settings cannot be adjusted without the unit being removed.
- For further details, please consult Vector's 'Technical Requirements for Connection of Distributed Generation', which is available on www.vectorelectricity.co.nz



Safety

Your distributed generation system will feed electricity into Vector's network. For everyone's safety, Vector must be notified of your connection to our network. This ensures our linesmen know about the possibility of live electricity coming from your generator when they are working on the network lines in your area.

Without that knowledge, live electricity from your distributed generation system could be feeding into a section of our network where all other sources of electricity are inactive. This live electricity could electrocute a linesman.

For everyone's safety your generating system must, as a minimum, meet statutory requirements, comply with international manufacturing standards and meet safety standards specified by Vector. Not all distributed generation systems have the necessary safety mechanisms for use on a distribution network in New Zealand, so more details about Vector's minimum required standards are on page 7.

Four steps to generating and selling your own electricity

A guide to installing distributed generation with a capacity of 10kW or less

<p>STEP 1 – Select your system</p>	<p>Solar panels (photovoltaic), small wind and micro-hydro generators are the most commonly used systems for distributed generation.</p> <p>More information on page 7.</p>
<p>STEP 2 – Talk to your electricity retailer</p>	<p>You will need to discuss:</p> <ul style="list-style-type: none"> • Supply of import/export meters • Sale of surplus energy • The tariff they will apply <p>More information on page 8.</p>
<p>STEP 3 – Arrange installation</p>	<p>You must:</p> <ul style="list-style-type: none"> • Use a registered electrician • Comply with all relevant regulations and standards • Get an electrical Certificate of Compliance (COC) <p>More information on page 8.</p>
<p>STEP 4 – Notify Vector once connected</p>	<p>You must send Vector:</p> <ul style="list-style-type: none"> • A completed copy of the 'Notification of Connection – Distributed Generation ($\leq 10\text{kW}$)' • A copy of the electrical Certificate of Compliance (COC) <p>Your registered electrician can complete this information for you.</p> <p>Vector will process this information for you free of charge.</p> <p>More information on page 9.</p>

Step 1 – Select your system

Solar panels, also known as photovoltaics, are the most commonly used systems for distributed generation of 10kW or less. Small wind systems and micro-hydro generators can also be used.

These systems are available from various suppliers. Please note that Vector can take no responsibility for any claims or information provided by your supplier. We advise that you talk to your registered electrician and compare the specifications of various products before deciding on a system.

Minimum standards

Your surplus electricity will flow onto Vector's distribution network. Therefore, your system must, as a minimum, comply with Vector's 'Technical Requirements for Connection of Distributed Generation', Vector's 'Distribution Code' and AS 4777.2 and AS 4777.3 standards.

Vector recommends that you familiarise yourself with these documents so that you can make an informed decision when choosing your distributed generation system.

Safety standards

Your system needs to comply with the standards of AS 4777.2 and 4777.3 to ensure safety for use on Vector's network.

Systems that comply with these standards are classified as 'non-islanding' systems. This means your distributed generator will automatically isolate itself if there is a power outage on the section of Vector's network you are connected to. It also means your system will not reconnect to Vector's network until we have restored the supply.

This allows our linesmen to isolate a section of line so they can safely work on it without the potential for your distributed generator to backfeed live electricity into that section of line and electrocute the linesman.

To avoid such safety risks and potential harm, your system will need to comply with the specified standards, be installed by a registered electrician and Vector must be notified when your system has been connected.

Step 2 - Talk to your electricity retailer

Any surplus electricity you generate may be sold back to your electricity retailer. You will need to arrange with your electricity retailer to take receipt of or purchase your surplus electricity. Vector is able to inform you of which electricity retailers operate in your area. You will need to complete those arrangements before your system can be connected to Vector's network.

A new meter

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.

Distribution lines charges

Your lines charges from Vector will be based on the energy that is supplied to you from the distribution network. This is the amount of energy recorded in the import register of your import/export meter.

Step 3 - Arrange installation

The system you choose should include manufacturer's installation instructions. To comply with all the necessary building and electrical codes and standards, you must use a suitably qualified installer. You must also check with your local Council to find out if any building or other consents may be required.

A registered electrician must do all wiring associated with the system. The wiring must comply with AS/NZS 3000 or any successive standard or legislation.

Meeting the standard

Your registered electrician needs to comply with AS 4777.1 when installing your system. While AS 4777.1 deals primarily with the connection of inverter-based systems, it is equally applicable to distributed generation systems that do not use inverters. The purpose of complying with this standard is to ensure safety when your system is connected to the network, and to prevent accidents on the network or damage to your equipment in the future.

If your distributed generator continued to operate after a network fault, your system could live up Vector's electricity network at a time it was assumed to be de-energised. This could lead to a serious accident for anyone working on the network, and/or damage to your equipment. A system manufactured to AS 4777.2, including protection systems installed in accordance with the AS 4777.3, will provide isolation and prevent this happening.

Step 4 - Notify Vector once connected

As your distributed generation system will be connected to Vector's network, we need to know the details of your system to ensure the safety of our linesmen. We also need to log your connection into our network register.

Once your registered electrician has connected your system, Vector will require the following documents:

- A copy of the Certificate of Compliance (COC), and
- A completed 'Notification of Connection – Distributed Generation ($\leq 10\text{kW}$)' form

We recommend you keep a copy of these documents for your own records.

Our 'Notification of Connection – Distributed Generation ($\leq 10\text{kW}$)' form is available;

- on Vector's website: www.vectorelectricity.co.nz
- by phone on (09) 303 0626
- by mail from: Customer Connection Coordinator
Vector Limited
PO Box 99882
Newmarket
Auckland
- by email from: dginfo@vector.co.nz

Change of occupancy

You are responsible for the maintenance of your distributed generation system to the appropriate standards. You are also responsible for notifying any future owners/tenants of the property about the responsibility and obligations of having a distributed generator connected to Vector's network.

Should you sell your property, or someone else moves in, it is important that the new operator of the distributed generator understands the requirements for ensuring a safe and well-maintained electricity connection. The new owner/operator must complete the 'Notification of Connection – Distributed Generation ($\leq 10\text{kW}$)' form with their amended details.

For further information

When you decide to install distributed generation, you want to do it right. We want you to do it right too. So if you have any queries or you require further information, please call us on (09) 303 0626.

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