

Distributed Generation Policy



Information and Application Forms

Introduction to Distributed Generation

Distributed generation is generation located at consumers premises connected to the Buller Electricity distribution network. These systems are capable of generating electricity for the premises' own use, and may also export surplus electricity into the Buller Electricity Limited distribution network. These generators can take many forms; diesel generators, wind turbines and solar panels are the most common.

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

This guide contains information designed to help you understand distributed generation and how to apply to connect it to our network.

Different processes exist for the connection of distributed generation depending on the size of the system to be installed. Part 1 describes the connection process for small systems (10 kilowatts capacity or less), while Part 2 describes the connection process for larger systems (greater than 10 kilowatts capacity).

General information relating to the connection of distributed generation is provided in Part 3.

For more information about distributed generation, please contact Buller Electricity:

Email

info@bullernetwork.co.nz

Website

www.bullernetwork.co.nz

Phone

03 788 8171

Postal Address

Buller Electricity Limited
P.O. Box 243
Westport 7866

Physical Address

Buller Electricity Limited
Robertson St
Westport 7825

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Part 1: Distributed Generation with Capacity of 10kW or less

1. General Information

This information is for people who want to connect small-scale distributed generation systems (of capacity 10kW or less) to Buller Electricity's distribution network to generate electricity and possibly export energy into our network. These systems are usually single-phase, but may be two- or three-phase. They are typically installed at residential or small commercial premises.

This information does not apply to generation systems which are not connected to our network. For information about connecting larger distributed generation, see Part 2 of this information pack: 'Distributed Generation with Capacity above 10 kW'.

Talk to us about your proposed distributed generation

If you intend to install distributed generation which is to be connected to the Buller Electricity network you will need to involve us in the process as early as possible. Any distributed generation connected to our network must meet all relevant statutory, regulatory, technical, and safety requirements. If you connect distributed generation to our network, equipment and procedures must be in place to ensure safe interaction between your distributed generator and our network.

2. The Connection Process

The 5 steps that you will need to undertake to connect distributed generation of 10kW or less to our network are outlined below:

STEP 1 – Select your distributed generation system	Talk with distributed generation suppliers/installers and make an informed decision on which system will best meet your requirements.
STEP 2 – Contact your electricity retailer	You must have an agreement in place with your energy retailer for the purchase of surplus energy exported into our network.
STEP 3 – Apply to Buller Electricity for connection	You must submit an "Application for Connection – Distributed Generation ≤10kW" to Buller Electricity (see Part 1 Section 3 of this document – page 5).
STEP 4 – Arrange installation of your distributed generation	Arrange for a registered electrician to install your system and ensure that it meets all technical, safety, and compliance requirements.
STEP 5 – Notify Buller Electricity once the system is installed	You must submit a "Notification of Connection – Distributed Generation ≤10kW" to Buller Electricity once installation work has been completed (page 5).

The 5 steps for connection are described in more detail in the following sections. This information complies with the Electricity Industry Participation Code 2010, Part 6 Connection of Distributed Generation (which can be viewed at the following website <http://www.ea.govt.nz/code-and-compliance/the-code/part-6-connection-of-distributed-generation>).

2.1 Step 1 – Select your distributed generation system

Distributed generation of 10kW or less will usually make use of solar power (photovoltaic panels). Less frequently it will make use of wind or micro-hydro generators. In the vast majority of these distributed generation installations an inverter will be used to connect the generation to the distribution network.

Surplus electricity generated at your premises will be exported onto our network. To avoid safety risks and the potential for harm your system must comply with specific standards, be installed by a registered electrician, and Buller Electricity must be notified once the system has been connected.

Your distributed generator must automatically isolate itself if there is a power outage on the section of our network to which your premises is connected. It also must not reconnect to our network until supply has been restored for a specified length of time. As a minimum your distributed generation system must comply with:

- Buller Electricity's 'Network Connection Standard'
- Buller Electricity's 'Distributed Generation ≤10kW Connection Standard'
- AS4777.1 Grid Connection of Energy Systems via Inverters – Installation Requirements
- AS4777.2 Grid Connection of Energy Systems via Inverters – Inverter Requirements
- AS4777.3 Grid Connection of Energy Systems via Inverters – Grid Protection Requirements
- AS/NZS 3000 Electrical Installations (known as the Australian/New Zealand Wiring Rules)

Buller Electricity connection standards are available from <http://www.bullerelectricity.co.nz/our-network/distributed-generation/>.

AS4777 and AS/NZS 3000 are available from www.standards.com.au and shop.standards.co.nz, or they may be available at your public library. While these standards have been created with solar power systems in mind, they can be applied to other systems.

A list of AS4777 compliant inverters which are pre-approved for connection on our network is given in Part 1 Section 4.

2.2 Step 2 – Contact your electricity retailer

You must discuss your proposed distributed generation installation with your electricity retailer, as any surplus energy which you generate must be purchased by them. Unless you have contractual arrangements for the purchase of any surplus electricity generated, and an electricity retailer is responsible for your connection, you will not be able to connect to our network.

Your electricity retailer will arrange for the appropriate metering to be installed at your premises. As a generator of electricity you are required to have import/export metering so that the amount of electricity which is exported into the distribution network can be measured (even if this seems

unlikely). Your retailer will advise of any rental charge for the metering equipment. You may also be charged a meter change fee, depending on your location and your existing metering setup.

2.3 Step 3 – Apply to Buller Electricity for connection

Buller Electricity needs to know where distributed generation is connected on our network for safety, administration, future network design and planning, congestion management, and to ensure your system will not adversely affect other consumers connected to the network. While at current levels of distributed generation, small domestic systems (typically less than 5kW) are unlikely to have significant impacts on our network, this may change as the number of distributed generation systems connected increases in the future.

You must complete a connection application form (see Part 1 Section 3 of this information pack – page 5) and return it to us, along with the detailed information requested in the form. For example, we need to know the location, type, size and specification of your proposed distributed generation system, plus the electrical contractor who will install your system. We also need to know which electricity retailer is responsible for your connection. We will acknowledge the receipt of your application.

It is important that the inverter that you intend to install complies with the AS4777 standard. If your proposed inverter is not on our list of pre-approved inverters (see Part 1 Section 4 of this information pack – page 12) you will need to provide a copy of the supplier's AS4777 Declaration of Conformity (proving that the inverter has been type-tested as complying with all relevant parts of AS4777 by a laboratory with accreditation issued or recognised by International Accreditation New Zealand).

We may require an application fee to be paid before your application is processed (see Part 3 Section 1 of this information pack – page 32).

2.4 Step 4 – Arrange installation of your distributed generation

Any distributed generation equipment which 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, and comply with safety regulations 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 outage it would pose a serious safety threat on our network. It could have serious consequences for anyone working on the network and/or could damage your equipment. A system manufactured to Australian Standard AS4777.2 and with protection systems installed in accordance with the Australian Standard AS4777.3 will automatically isolate your distributed generation and prevent this happening.

Your registered electrician should closely follow AS4777.1 when installing your equipment. While AS4777.1 deals primarily with connection of inverter based systems, its principles should also be followed for distributed generation systems that do not employ inverters.

Buller Electricity has the right to inspect distributed generation that is connected to our network to ensure the system installed meets our requirements and all information provided is correct. If an inspection is deemed necessary we will arrange a suitable date and time on which the inspection will

take place. An associated inspection fee as may be charged (see Part 3 Section 1 of this information pack – page 32).

2.5 Step 5 – Notify Buller Electricity once the system is installed

Once a registered electrician has installed and connected your distributed generation we require the following documents to be submitted to us:

- A completed 'Notification of Connection – Distributed Generation $\leq 10\text{kW}$ ' form (see Part 1 Section 3 – page 5)
- Final copy of the distributed generation circuit diagram
- Distributed generation test report
- Schedule of protection settings
- A copy of the Certificate of Compliance (COC)
- Details of the metering which has been installed

Buller Electricity will provide a final approval notice within 10 business days of receiving these documents, at which point in time the distributed generation may be connected to the network.

Unless otherwise agreed by the distributed generator and Buller Electricity the contractual terms for the connection of distributed generation to our network will be as per the regulated terms (see Electricity Industry Participation Code 2010, Schedule 6.2 Regulated terms for distributed generation).

If the distributed generation is considered to be non-compliant or incomplete information has been provided, we will advise you of this deficiency. If you do not remedy the deficiency we may require you to disconnect your distributed generation and an associated deficiency fee may be charged (see Part 3 Section 1 of this information pack – page 32).

2.6 Change of ownership or occupancy

You are responsible for the maintenance of your system to the appropriate standards. Should you sell your property or someone else moves in, it is important that the new owners/operators understand the requirements for operating the equipment and its connection to our network.

A new owner/operator must complete a new 'Notification of Installation – Distributed Generation $\leq 10\text{kW}$ ' form with updated details.

3. Application and Notification Forms

The forms provided in this section must be submitted to Buller Electricity during the connection process.

Form Title	Number of Pages	To be submitted to Buller Electricity
'Application for Connection – Distributed Generation $\leq 10\text{kW}$'	2	Before Installation
'Notification of Connection – Distributed Generation $\leq 10\text{kW}$'	3	After Installation

Notification of Connection – Distributed Generation ≤10kW



Distributed Generation Details	
Manufacturer(s) and Model(s)	
Fuel Source(s)	
Location of Distributed Generation	
Inverter Manufacturer(s) and Model(s)	
Inverter is on Pre-Approved List	YES <input type="checkbox"/> NO <input type="checkbox"/>
Number of Inverters and Configuration	
Inverter Serial Numbers	
Location of Inverter	
Connection Voltage & Total kVA Rating	Volts kVA
Power Factor & Number of Phases	PF Phases
Maximum Peak Short Circuit Current (A)	
Location of Isolating Switch	
Battery Storage Details	

Required Information – to be included with this form	
Final copy of circuit diagram	Attached <input type="checkbox"/>
Distributed generator test report	Attached <input type="checkbox"/>
Schedule of protection settings	Attached <input type="checkbox"/>
Certificate of Compliance	Attached <input type="checkbox"/>
Electricity meter(s) make and model	Attached <input type="checkbox"/>

Notification of Connection – Distributed Generation ≤10kW



Declaration – to be completed by the electrical contractor or installer	
The distributed generation installation complies with the relevant sections of AS/NZS 3000 and AS/NZS 3010	YES <input type="checkbox"/>
Protection settings have been set to comply with AS4777	YES <input type="checkbox"/>
The installation complies with Buller Electricity’s ‘Distributed Generation ≤10kW Connection Standard’	YES <input type="checkbox"/>
Protection settings are protected from alteration except by prior written agreement between Buller Electricity and distributed generation owner	YES <input type="checkbox"/>
Installers Comments:	
<p><i>I confirm that the information provided in this form is true and accurate.</i></p> <p>Name: _____ Registration Number: _____</p> <p>Signature: _____ Date: _____</p>	

Distributed Generation Owner/Operator Signature
<p><i>I confirm that I have received instructions in the correct operation of the distributed generation, and I acknowledge the contractual terms for connection to the Buller Electricity network are as per the regulated terms set out in Schedule 6.2 of the Code.</i></p> <p>Name: _____</p> <p>Signature: _____ Date: _____</p>

4. Pre-Approved Inverters

This is a list of AS4777 compliant inverters that are pre-approved for connection to Buller Electricity's network.

Make	Model	Expiry Date
EnaSolar	1.5KWGT-AUNZ	
EnaSolar	2KWGT-AUNZ	
EnaSolar	3KWGT-AUNZ	
EnaSolar	3.8KWGT-AUNZ	
EnaSolar	4KWGT-AUNZ	
EnaSolar	5KWGT-AUNZ	
ENPHASE	M215	
FRONIUS	IG-15	
FRONIUS	IG-20	
FRONIUS	IG-30	
FRONIUS	IG-40	
FRONIUS	IG-60	
INVOLAR	MAC250A-230-AU	15 August 2016
Power-One Aurora	UNO-2.0-I-OUTD_S	30 October 2017
Power-One Aurora	UNO-2.0-I-OUTD	30 October 2017
Power-One Aurora	UNO-2.0-I-OUTD_W	30 October 2017
Power-One Aurora	UNO-2.5-I-OUTD_S	30 October 2017
Power-One Aurora	UNO-2.5-I-OUTD	30 October 2017
Power-One Aurora	UNO-2.5-I-OUTD_W	30 October 2017
Power-One Aurora	PVI-1700OUTD-AU	19 July 2018
Power-One Aurora	PVI-2000OUTD-AU	19 July 2018
Power-One Aurora	PVI-3.0-OUTD-S	18 November 2019
Power-One Aurora	PVI-3.0-OUTD	18 November 2019
Power-One Aurora	PVI-3.0-OUTD-W	18 November 2019

Make	Model	Expiry Date
Power-One Aurora	PVI-3.6-OUTD-S	18 November 2019
Power-One Aurora	PVI-3.6-OUTD	18 November 2019
Power-One Aurora	PVI-3.6-OUTD-W	18 November 2019
Power-One Aurora	PVI-4.2-OUTD-S	18 November 2019
Power-One Aurora	PVI-4.2-OUTD	18 November 2019
Power-One Aurora	PVI-4.2-OUTD-W	18 November 2019
SMA (SUNNY BOY)	SB1700	
SMA (SUNNY BOY)	SB2500	
SMA	STP 5000TL-20	29 October 2017
SMA	STP 6000TL-20	29 October 2017
SMA	STP 7000TL-20	29 October 2017
SMA	STP 8000TL-20	29 October 2017
SMA	STP 9000TL-20	29 October 2017
SMA	WTP 5000TL-20	29 October 2017
SMA	WTP 6000TL-20	29 October 2017
SMA	WTP 7000TL-20	29 October 2017
SMA	WTP 8000TL-20	29 October 2017
SMA	WTP 9000TL-20	29 October 2017
Schneider Electric	Conext RL 3000E	7 August 2018
Schneider Electric	Conext RL 4000E	7 August 2018
Schneider Electric	Conext RL 5000E	7 August 2018
Sungrow	SG2K5TL-S	4 September 2019
Sungrow	SG2KTL-S	16 February 2020
Sungrow	SG3K5TL-S	4 September 2019
Sungrow	SG3K6TL-S	13 February 2020
Sungrow	SG3K6LT-S	16 February 2020
Sungrow	SG3KLT-M	23 August 2017
Sungrow	SG3KLT-D	13 February 2020

Make	Model	Expiry Date
Sungrow	SG3KTL-S	4 September 2019
Sungrow	SG4K6TL-D	13 February 2020
Sungrow	SG4KLT-M	23 August 2017
Sungrow	SG4KLT-S	4 September 2019
Sungrow	SG5KTL-D	13 February 2020
Sungrow	SG5KTL-M	23 August 2017
Sungrow	SG10KTL	22 December 2016
Sungrow	SG12KTL	22 December 2016
Sungrow	SG15KTL	22 December 2016
Sungrow	SG20KTL	22 December 2016
Sungrow	SG30KTL	22 December 2016

Part 2: Distributed Generation with Capacity above 10kW

1. General Information

This information is for people who want to connect medium to large-scale distributed generation systems (above 10kW capacity) to Buller Electricity's distribution network to generate electricity and possibly export energy into our network. These systems can take a number of different forms including solar panels, wind turbines, hydro, fuel cells or diesel and gas generation. They would typically be three-phase and installed at industrial, commercial or rural sites.

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

For information about connecting smaller distributed generation, see Part 1 of this information pack: 'Distributed Generation with Capacity of 10 kW or less'.

Talk to us about your proposed distributed generation

Installing distributed generation is complex. If you intend to install distributed generation then you will need to involve us in the process as early as possible. Each distributed generation situation is different and needs to be discussed with us.

In order to provide information for the connection of larger distributed generation, Buller Electricity has prepared a technical standard for the connection of generation greater than 500kW. This standard will be made available on request.

Any agreement to connect distributed generation to our network may include costs associated with design and reinforcement of the existing network. If network reinforcement is required, the design and schedule for this project work will need to be factored into your installation planning. Projects may be constrained by network resources and restrictions.

Once you have finalised your distributed generation design, we will need to review it before we will allow it to connect to our network. As with any new or altered electricity connections, we will need to see a Certificate of Compliance for the installation before it can be connected.

Larger generation (above 1000kW) may be subject to Transpower's terms and conditions. If this is the case we will assist with responses to Transpower's requests, however the generation owner will be responsible for providing any requested information.

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 generation and our network.

2. The Connection Process

Outlined below are the steps that you will need to take to connect distributed generation of capacity 10kW or more to our network. This information complies with the Electricity Industry Participation Code 2010, Part 6 Connection of Distributed Generation (which can be viewed at the following website <http://www.ea.govt.nz/code-and-compliance/the-code/part-6-connection-of-distributed-generation/>).

a) Select your system

Before purchasing and installing a distributed generation system it is recommended that you make an application for connection and get Buller Electricity's approval for the system you intend to connect. This will ensure that all design and technical aspects of your connection will meet the standards required by Buller Electricity.

The generation system you select must conform to AS/NZS 3000 – Electrical Installations (known as the Australian/New Zealand Wiring Rules) and associated standards, which you can purchase and download from shop.standards.co.nz or they may be available at your public library.

If your distributed generation system uses an inverter to connect to the distribution network then it must conform to the relevant technical standards including:

- 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

You can purchase and download these standards from www.standards.com.au or they may be available at your public library. While these standards have been created with solar powered systems in mind, they can also be applied to other systems.

We also recommend that you consider and follow the NZ Electricity Engineers Association "Guide for Connection of Generating Plant" which can be obtained from www.eea.co.nz.

b) Contact your electricity retailer

You must discuss your proposed distributed generation installation with your electricity retailer, as any surplus energy you generate will be purchased by them. Unless you have contractual arrangements for the purchase of any surplus electricity generated, and an electricity retailer is responsible for the connection, you will not be able to connect to our network.

c) Notify Buller Electricity by completing an initial application form

Generation systems above 10kW in capacity can have significant impacts on our network. We need to know where the distributed generation system will be connected and ensure the generation operates safely. Ideally, you should contact us as soon as you have decided which system you intend to install.

You will need to complete an initial application form (see Part 2 Section 3 of this information pack – page 25) and return it to us, along with the detailed information requested.

d) Application fees

We may require an application fee to be paid before your initial application is processed as prescribed in Schedule 6.5 of the Code (see Part 3 Section 1 of this information pack – page 32).

e) Confirmation that your initial application is complete

Within five business days of receiving your initial application we will advise you in writing whether or not your initial application is complete.

f) After your initial application

Within 30 business days of receiving your completed initial application we will provide you with the following information (as required by clause 12, Schedule 6.1 of the Code):

- (a) the capacity of our distribution network, including both the design capacity (including fault levels) and actual operating levels;
- (b) the extent to which connection and operation of your distributed generation may result in a breach of the relevant standards for safety, voltage, power quality, and reliability of supply to other connected parties;
- (c) any measures or conditions (including modifications to the design and operation of our distribution network or to the operation of your distributed generation) that may be necessary to address the matters referred to in paragraphs (a) and (b);
- (d) the approximate costs of any network-related measures or conditions identified under paragraph (c) and an estimate of time constraints or restrictions that may delay the connecting of your distributed generation;
- (e) any further detailed investigative studies that we reasonably consider are necessary to identify any potential adverse effects on the system resulting from the proposed connection, together with an indication of:
 - (i) whether we agree to you, or a suitably qualified agent for you, undertaking those studies; or
 - (ii) if not, whether we could undertake those studies and, if so, the estimated cost of the studies that you would be charged;
- (f) any obligations to other parties that may be imposed on us and that could affect your distributed generation (for example obligations to Transpower, in respect of other networks, or under the Code);
- (g) any additional information or documents that we consider would assist your application; and
- (h) information about the extent to which planned and unplanned outages may affect the operation of your distributed generation.

g) Other information to assist with your decision making

You can request further information from us which is reasonably necessary to enable you to consider and act on the information which we provided in response to your initial application. We will provide this further information within 10 business days of receiving your request.

h) Your final application

If you choose to proceed with your connection to our network, you must do so within 12 months after we evaluate your initial application. The information required in the final application will be dependent on the size and nature of the generation being connected. For the vast majority of medium sized generation it will not differ significantly from the initial application. For larger distributed generation Buller Electricity will discuss the requirements with the applicant.

Note that under clause 16, Schedule 6.1 of the Code, we are required to give notice to third parties that you have made a final application if that we consider that the third party will be affected by the approval of your final application. Under normal circumstances this would be other distributed generators (either connected or in the approval process) which will be making use of the same part of the Buller Electricity network.

i) Our acceptance of your application for generation

Within 45 business days of receiving your final application we will give written notice of our decision to approve or decline your application for generation, and whether any conditions or other measures apply if we accept your application. Please note that notice can be extended under the provisions outlined in Schedule 6.1 of the Code.

j) If we decline your application

If we decline your application we will detail our reasons. If you disagree with our decision, a dispute resolution process is provided in Schedule 6.3 of the Code (which can be viewed at the website <https://www.ea.govt.nz/code-and-compliance/the-code/part-6-connection-of-distributed-generation/schedule-6-3/>).

k) Your intention to proceed

After we approve your final application you have 30 business days (or a mutually agreed longer period) to notify us in writing if you want to proceed with the distributed generation connection, and if so, confirming:

- (a) the details of the distributed generation to be connected; and
- (b) that you accept all of the conditions (or other measures) which we have specified as conditions of the connection.

Notice can be extended under the provisions outlined in Schedule 6.1 of the Code. Please note that if you choose not to proceed, and then apply to connect the same generation at a later date, we may charge a further application fee.

l) Connection contract for distributed generation

Under the Code we have 30 business days to negotiate a connection contract with you after you notify us in writing of your intention to proceed. Unless mutually agreed otherwise, the contractual terms for the connection will be governed by the Electricity Industry Participation Code 2010, [Schedule 6.2 Regulated terms for distributed generation](#).

For larger generators, or if otherwise deemed necessary, an individual connection contract may be negotiated which takes into account the specific nature of the generation under consideration. The regulated terms will act as a default agreement if we are unable to negotiate a connection contract.

m) Metering

As a generator of electricity you are required to have import/export metering so that the amount of electricity which is exported into the distribution network can be measured (even if this seems unlikely). Your electricity retailer will arrange for the appropriate metering to be installed at your premises.

Your retailer will advise of any rental charge for the metering equipment. You may also be charged a meter change fee, depending on your location and your existing metering setup.

n) Testing and inspection

Please note that after your final application has been approved and the steps outlined above are complete, as a minimum you must:

- (a) test and inspect your distributed generation before connection;
- (b) give us adequate notice of the tests and inspection – we may send qualified personnel to the site to observe the testing and inspection; and
- (c) provide us with a written test report after testing and inspection. This report must confirm that the metering installation has a Certificate of Compliance. The following tests should be carried out on both generation and associated control equipment:
 - secondary injection testing of all protection
 - proof of tripping circuits for protection operation
 - automatic synchronising and interlocking
 - load and VARs sharing stability
 - loss of mains testing
 - compliance of warning signs and labelling.

We may charge a fee for observing the testing and inspecting as prescribed in Schedule 6.5 of the Code (see Part 3 Section 1 of this information pack – page 32).

o) Notification of connection

At this point you need to complete and submit a 'Notification of Connection – Distributed Generation >10kW' form to Buller Electricity (see Part 2 Section 3 of this information pack – 25). It requires

declarations by both the installer and owner of the distributed generation confirming technical details, compliance with electrical standards and acceptance of the contractual terms for connection to the Buller Electricity network. This step is important as it completes the process and formally establishes information about the generation installation.

Once the 'Notification of Connection – Distributed Generation >10kW' has been submitted and Buller Electricity has provided written approval, you will be able to permanently connect your generation to our network. Given that all requirements have been met, approval can be expected within 10 working days.

p) Change of ownership

You are responsible for the maintenance of your system to the appropriate standards. Should you sell your property or someone else moves in, it is important that the new owner and operator understands the requirements for operating the equipment and its connection to our network safely. A new owner must complete a new 'Notification of Connection – Distributed Generation >10kW' form with updated owner details and accept the contractual terms for connection.

3. Required Distributed Generation Information

You must provide Buller Electricity with information so that we can assess if your distributed generation can successfully connect to our network without affecting other connected customers. Please note that an application fee may be payable if we need to carry out significant research and analysis to assess the potential impact of your proposed distributed generation.

We will evaluate the total export capacity of your proposed distributed generation (i.e. the maximum amount of electricity that your generation is able to inject into our network) to assess whether your proposed generation will exceed the capacity of your electricity connection. To complete this evaluation, we will need evidence of your generation capacity – normally a kW rating. Please attach to your application a copy of the manufacturer's specifications and/or a photograph of the 'name plates' for your proposed generation, as evidence of its capacity. Additional information may be required if the manufacturer's specifications are not comprehensive.

The extent of the information required will depend on the size (capacity) and type of generation. This information will remain confidential between us unless agreed otherwise, however we reserve the right to release information about the distributed generation to meet our obligations to Transpower, the operator of the national grid, or as required by the Electricity Industry Participation Code 2010.

We will use the information supplied in your application to evaluate and model our network to decide what method of connection would be needed and the voltage level at which the connection should be made.

In order to provide information for the connection of larger distributed generation, Buller Electricity has prepared a technical standard for the connection of generation greater than 500kW. This standard will be made available on request.

The following provides a guide to the information which will be required to be provided for distributed generation in the size ranges 10-100kVA, 100-750kVA, and >750kVA. Control arrangements, protection, and network islanding are also discussed with reference to the equipment and systems which are expected to be put in place.

Data required for each distributed generation system

Data required for range of distributed generation capacity	10-100 kVA	100-750 kVA	>750 kVA
Type of generation unit – synchronous, asynchronous, etc	✓	✓	✓
Type of prime mover	✓	✓	✓
Rated terminal voltage (kV)	✓	✓	✓
Rated generation capacity (kVA)	✓	✓	✓
Rated minimum power factors (both over and under excited) at rated kVA		✓	✓
Maximum continuous active power generated (kW)	✓	✓	✓
Maximum short term active power generated (kW)		✓	✓
For asynchronous generations, reactive power requirements (kVAr)	✓	✓	✓
Anticipated operating regime e.g. continuous, intermittent, peak lopping	✓	✓	✓
Method of voltage control	✓	✓	✓
Generation transformer details, if applicable			✓

Interface arrangements

Data required for range of distributed generation capacity	10-100 kVA	100-750 kVA	>750 kVA
The means of connection and disconnection	✓	✓	✓
The means of synchronisation between the distribution network and the distributed generation	✓	✓	✓
Generation neutral earthing arrangements			✓
Single line diagram for installation detailing circuit breakers, base loads and generation capabilities	✓	✓	✓

Technical data

Data required for range of distributed generation capacity	10-100 kVA	100-750 kVA	>750 kVA
Lowest frequency at which the distributed generation can run			✓
Actual low frequency trip setting and time delay	✓	✓	✓
Actual over frequency trip setting and time delay	✓	✓	✓
Minimum operating power			✓
Generation kW/kVA capability charts (at lower voltage terminals at nominal and ±10% of nominal voltage) at:			
(a) maximum short term power			✓
(b) maximum continuous power		✓	✓
(c) 75% output			✓
(d) 50% output			✓
(e) minimum power			✓
Auxiliary power requirements at:			
(a) rated power output			✓
(b) minimum power output			✓
(c) start up			✓
Start up times to minimum operating power:			
(a) from cold			✓
(b) from warm			✓
(c) from hot			✓
Normal ramp rate			✓
Time for cold start to full rated output		✓	✓
Inertia constant (seconds) (whole machine)			✓
Stator resistance			✓
Direct axis synchronous reactance			✓
Quadrature axis synchronous reactance			✓
Direct axis transient reactance			✓
Quadrature axis transient reactance			✓

Direct axis sub transient reactance			✓
Quadrature axis sub transient reactance			✓
Leakage (positive sequence) reactance			✓
Negative sequence reactance			✓
Zero sequence reactance			✓
Earthing resistance/reactance			✓
Time constants:			
(a) direct axis transient open circuit			✓
(b) quadrature axis transient open circuit			✓
(c) direct axis sub transient open circuit			✓
(d) quadrature axis sub transient open circuit			✓
Generation transformer details (impedance, tap changer, vector group, earthing, maximum overvoltage capability at rated frequency etc.)			✓
Type of excitation system (block diagram/specifications, forward/feedback gains/time constants and limits)		✓	✓
Speed governor and prime mover data (detailed functional description of governing system with all subsystems including system control and turbine time)		✓	✓

Control arrangements

It is preferable for distributed generation not subject to dispatch to export reactive energy (kVArh) whenever real energy (kWh) is exported onto our network. Subject to network voltage remaining within agreed limits, the desired power factor should be between 0.85 and 0.9.

We will advise if continuously acting fast automatic excitation and/or governor control systems are required to control the distributed generation voltage and frequency. This will depend on the size and type of distributed generation and the characteristics of the part of our network to which it is connected.

Protection

Distributed generation must be equipped with the appropriate protection elements as required by the “EEA Guide for the Connection of Generating Plant”. Distributed generators must consult us with regard to any special arrangements or protection that may be necessary due to the characteristics of our network. The general protection requirements are outlined below:

Protection requirements for range of distributed generation capacity	10kW > 100kW	100kW > 750kW	> 750 kW
Generation circuit breaker	✓	✓	✓
Dedicated transformer			✓
Disconnect/isolate switch	✓	✓	✓
Over-voltage protection	✓	✓	✓
Under-voltage protection	✓	✓	✓
Over-frequency protection	✓	✓	✓
Under-frequency protection	✓	✓	✓
Earth-fault protection		✓	✓
Over-current voltage restraint protection			✓
Neutral voltage displacement protection	✓	✓	✓
Synchronisation	✓	✓	✓
Loss of network supply (see Islanding notes)	✓	✓	✓
Power factor or voltage regulation equipment		✓	✓

The distributed generation protection systems must co-ordinate with the protection associated with our network as follows:

- (a) In order to keep the impact of faults on our network to a minimum, the distributed generation must meet target clearance times for fault power flowing from our network. We will ensure that the relevant protection settings are compatible with the target clearance times that we specify;
- (b) The settings of any protection which controls a circuit breaker, or the operating parameters of any automatic switching device at any network connection point, must be approved by us;
- (c) The distributed generation protection must co-ordinate with any auto re-close settings specified by us; and
- (d) Any distributed generation connected to our network may be required to withstand, without tripping, the negative phase sequence loading during the clearance of a close-up phase-to-phase fault by our network back-up protection.

Generatation network islanding

All distributed generation must disconnect from our network when a network outage is detected.

Generation network islanding occurs when a fault on our network is isolated by network switches and the generation continues to supply power to the isolated network. Generation may disconnect and supply a load within their installation during a network outage (creating their own island).

Managing safety for operations and people becomes an issue with network islanding. If an attempt is made to re-liven the local network without synchronising to the distributed generation then substantial damage can occur to the network and to the customer's installation equipment.

It is therefore critical that all generation operating intentions and protection systems are detailed to us. We will decide, based on local network conditions and information given by you, whether network islanding is a credible possibility.

4. Application and Notification Forms

This section provides Application and Notification forms which will be able to be used for the connection of smaller generation systems making use of inverters. In this situation the initial and final applications can be made using the 'Application for Connection – Distributed Generation >10kW'.

Form Title	Number of Pages	To be submitted to Buller Electricity
'Application for Connection – Distributed Generation >10kW'	2	Before Installation as Initial Application
'Application for Connection – Distributed Generation >10kW'	2	Before Installation as Final Application
'Notification of Connection – Distributed Generation >10kW'	3	After Installation

For larger and more complex distributed generation systems the Application and Notification forms provide will be insufficient and further information should be appended as detailed in the previous section "Section 3 – Required Distributed Generation Information".

Notification of Installation – Distributed Generation >10kW



Please complete and submit to Buller Electricity after your distributed generation is installed.

Site Details – address where distributed generation is to be installed	
Site Address	
Telephone Number	
Electricity Retailer	
Customer ICP Number	
Date of Installation	
Connection Type	Existing <input type="checkbox"/> New <input type="checkbox"/> Residential <input type="checkbox"/> Commercial <input type="checkbox"/>

Distributed Generation Owner/Operator	
Name	
Contact Telephone Number	
Email Address	

Electrical Contractor or Installer Details	
Electrical Contractor or Installer	
Accreditation/Qualification	
Contact Person	
Telephone Number	
Email Address	

Notification of Installation – Distributed Generation >10kW



Distributed Generation Details	
Manufacturer(s) and Model(s)	
Fuel Source(s)	
Location of Distributed Generation	
Inverter Manufacturer(s) and Model(s)	
Inverter is on Pre-Approved List	YES <input type="checkbox"/> NO <input type="checkbox"/>
Number of Inverters and Configuration	
Inverter Serial Number(s)	
Location of Inverter(s)	
Connection Voltage & Total kVA Rating	Volts kVA
Power Factor & Number of Phases	PF Phases
Maximum Peak Short Circuit Current (A)	
Location of Isolating Switch	
Battery Storage Details	

Required Information – to be included with this form	
Final copy of circuit diagram	Attached <input type="checkbox"/>
Distributed generation test report	Attached <input type="checkbox"/>
Schedule of protection settings	Attached <input type="checkbox"/>
Certificate of Compliance	Attached <input type="checkbox"/>
Electricity meter(s) make and model	Attached <input type="checkbox"/>

Notification of Installation – Distributed Generation >10kW



Declaration – to be completed by the electrical contractor or installer	
The distributed generation installation complies with the relevant sections of AS/NZS 3000 and AS/NZS 3010	YES <input type="checkbox"/>
Protection settings have been set to comply with AS4777	YES <input type="checkbox"/>
The installation complies with Buller Electricity’s ‘Distributed Generation ≤10kW Connection Standard’	YES <input type="checkbox"/>
Protection settings are protected from alteration except by prior written agreement between Buller Electricity and distributed generation owner	YES <input type="checkbox"/>
<p>Installers Comments:</p> 	
<p><i>I confirm that the information provided in this form is true and accurate.</i></p> <p>Name: _____ Registration Number: _____</p> <p>Signature: _____ Date: _____</p>	

Distributed Generation Owner/Operator Signature
<p><i>I confirm that I have received instructions in the correct operation of the distributed generation, and I acknowledge the contractual terms for connection to the Buller Electricity network are as per the regulated terms set out in Schedule 6.2 of the Code.</i></p> <p>Name:</p> <p>Signature: _____ Date: _____</p>

Part 3: General Information

1. Maximum Fees for Connection of Distributed Generation

The maximum fees a distributor may charge for activities related to the connection of distributed generation is regulated by the Electricity Industry Participation Code 2010, [Schedule 6.5 Prescribed maximum fees](#).

Buller Electricity may require the payment of fees (up to the maximum fee stated) for any of the following activities:

Connection of distributed generation ≤ 10 kW	Maximum Fee
Fee for application	\$100
Fee for observation of testing and inspection	\$60
Fee for application deficiency	\$80
Fee for initial application for distributed generation > 10 kW	
Distributed generation of above 10 kW in total but less than 100 kW in total	\$500
Distributed generation of 100 kW or above in total but less than 1 MW	\$1,000
Distributed generation of 1 MW and above	\$5,000
Fee for observation of testing and inspection for distributed generation > 10 kW	
Distributed generation of above 10 kW in total but less than 100 kW in total	\$120
Distributed generation of 100 kW and above	\$1,200

2. Credits and Charges

Delivery credits

For distributed generation of capacity 10kW or less, Buller Electricity does not pay credits or rebates of any type for energy generated and exported onto our network. You should note however that the variable portion of the normal line charges (based on the number of kWh units used) can be avoided to the extent that your generation can reduce the load measured on the meter at your connection.

Distributed generation of capacity greater than 10kW which make a contribution to reducing Buller Electricity's peak winter network load are entitled to credits from Buller Electricity for Avoided Cost of Transmission (ACOT). Generators must apply to receive ACOT payments and agree to any associated conditions. To determine the value of the ACOT requires a time-of-use meter which is able to log the amount of energy exported in the standard electricity market half-hour periods. For further information on credits for ACOT, contact Buller Electricity.

Energy credits

Distributed generators are able to contract with electricity retailers to purchase any generated energy that is injected back into our network. This is a separate agreement to your connection agreement with Buller Electricity so we suggest you contact your electricity retailer to find out more about this.

Charges

Buller Electricity does not currently impose any ongoing charges in relation to distributed generation of capacity 10kW or less.

Distributed generators may be required to pay a fee to Buller Electricity for the assessment of connection applications. We may also charge a fee if it is deemed necessary for Buller Electricity to be involved in the testing and inspection of your generation connection.

At the time an application for connection is made we consider the costs of any extension or modifications that are required to our network (including any ongoing operational and maintenance costs) and generally require the distributed generator to cover all of these costs via a one-off capital contribution.

3. Export Congestion

Export congestion areas

Buller Electricity does not expect export congestion to be an issue in the foreseeable future. At the moment (May 2015) distributed generation is not causing congestion on our network and we do not anticipate generation of less than 10kW will cause any congestion in the next 12 months. We will continue to monitor this situation in the future and report on areas where the addition of further distributed generation will lead to congestion. For installation requests of more than 10kW individual assessments will need to be undertaken by Buller Electricity to determine whether or not export congestion may occur.

Export congestion management

Distributed generation has traditionally been used by customers to enhance their security of supply and reduce their costs associated with supply at times of peak demand on the distribution network. In this situation the generated energy is usually used on site and is not exported into the distribution network. Distributed generation operated in this manner does not contribute to export congestion and relieves congestion caused by network load growth.

New forms of distributed generation, such as solar power (photovoltaic panels), are being installed to reduce the quantity of electrical energy consumers require from the network, and to also export surplus generation into the distribution network. This can lead to significant amounts of electricity being exported into the distribution network and localised export congestion (typically in our LV networks). This is particularly the case in summer, when photovoltaic output is at a maximum and homeowners are either at work, or away on vacation, with very little electricity being used in the home.

Our network has been engineered with the expectation that electricity will flow in only one direction and congestion (import congestion) will occur at times of peak customer demand. The increasing use of distributed generation is likely to create reverse energy flows and export congestion on some parts of our network. Typically this will create excessively high voltages at the customer's premises, which can damage customer's electrical appliances as well as our network equipment.

If the connection of distributed generation is not managed there may be a risk to safety and increased remedial costs when incremental increases in generation result in specific power quality or fault level issues.

The Code aims to encourage cost effective generation, and Buller Electricity welcomes the connection of distributed generation to our network, providing all technical and regulatory requirements are met, there is no impact to other customer's, and the ability to operate our network safely is not compromised.

The output of distributed generation may need to be reduced or distributed generation disconnected under the following conditions:

- The output from distributed generation causes the network voltage to exceed limits set by the Electricity (Safety) Regulations 2010, clause 28.
- The operation of distributed generation represents a danger to personnel working on the network. This may be due to operation of the distributed generation being contrary to recognised industry-wide safe working practices e.g. isolation and earthing of circuits prior to carrying out work on HV or LV lines/cables.
- The output of distributed generation causes the rating of network equipment to be exceeded.

- The operation of distributed generation may disrupt the supply to other customers. For example the distributed generation may result in power quality issues, such as voltage fluctuations or harmonic interference, under certain conditions.

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 does not result in export congested or is always accompanied by an appropriate network upgrade that will relieve export congestion.
- by agreeing on a case-by-case basis on the real-time operational rules that will apply.

Buller Electricity will review all distributed generation applications and identify situations where connection may compromise the operation of the network. The best solution to export congestion will depend on the nature of the network congestion, the distributed generation operational characteristics and the business model of the proposal. Buller Electricity will work with distributed generators in order to try and find acceptable solutions for export congestion.

Changing network conditions and configurations may result in previously accepted distributed generation installations creating issues on the network at a later date. Under these circumstances we may require distributed generation to be curtailed or disconnected.

In line with the pricing principles in the Electricity Industry Participation Code 2010, Part 6 Connection of Distributed Generation, in situations where a proposed distributed generation will cause export congestion, and where this congestion requires the network to be reinforced, we will charge this to the connecting distributed generator.

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

4. Complaints and Disputes

At Buller Electricity we are committed to providing our customers with a reliable electricity supply and a high level of service. Unfortunately, there may be occasions when you are unhappy with our service. If you are dissatisfied with our service relating to your application for connection of distributed generation, let us know and we will try to resolve the issue quickly to everyone's satisfaction.

Contact us

You may lodge a complaint with Buller Electricity in any form. Our staff can usually take care of your enquiry over the phone at – 03 788 8171, you can email us at – info@bullernetwork.co.nz, or call in at our reception desk at Robertson Street, Westport, during normal office hours.

If your complaint is detailed, it can be useful to put your complaint in writing to:

Chief Executive Officer
Buller Electricity Limited
PO Box 243
Westport 7866

What happens when you make a complaint?

Buller Electricity is a member of the Utilities Disputes Limited (UDL). Under this complaints scheme, once we receive your formal complaint or notice of dispute:

- We will acknowledge your complaint within 2 working days
- We will investigate the issues that have led to your complaint and respond within 7 working days
- We will aim to settle your complaint within 20 working days. If we cannot we will advise you of the reason and agree an extension with you.
- If we cannot reach a settlement within 40 working days we will advise you of your options, including to refer the complaint to Utilities Disputes Limited

Utilities Disputes Limited

Buller Electricity is a member of Utilities Disputes Limited (UDL) and is bound by its rulings. However, you must first refer your complaint to us for resolution before it can be considered by UDL. If we are unable to resolve a complaint to your satisfaction, UDL provides a free independent service which can review and further investigate the issues for you, and make a ruling which is binding on us to settle the complaint. UDL can be contacted as follows:

Utilities Disputes Limited
Freepost 192682
PO Box 5875
Wellington 6140

Freephone: 0800 22 33 47
Email: info@utilitiesdisputes.co.nz
Website: <http://www.utilitiesdisputes.co.nz>

5. Glossary

Black start: Certain generation systems have the ability to black start, meaning they can restart their generation plant with no electrical input if the system has blacked out. Generation without this capability require power from the grid to restart their generating plant.

Certificate of compliance (COC): Registered electrical workers must audit their own work and fill out a Certificate of Compliance as proof that they have complied with electrical safety standards and codes. A customer should request the COC from their electrical contractor when work is completed. We will need to see the COC before we can connect the electrical installation to our network.

Code: Electricity Industry Participation Code 2010

Consumer/Customer: Any person (or organisation) who is supplied, or who has applied to be supplied, with electricity from the network

Distributed generation: Electrical equipment connected to the distribution network which produces electrical energy.

Distributed generator: The owner/operator of a distributed generation.

Distributor: Also called 'lines company', 'network company' or 'distribution company'. Distributors such as Buller Electricity Limited own and operate the lower voltage power lines and distribution networks in local areas. These connect to the national grid to deliver electricity to homes and businesses.

Electricity Authority: The Electricity Authority oversees the governance, operation and development of the New Zealand electricity industry.

Electrical contractor: In the context of new connections to Buller Electricity's network or upgrades to existing connections, an electrical contractor is a person or organisation contracted by either the customer, or the customer's consultant, to install part or all of the works required to achieve the new or upgraded electricity supply. This work generally involves low voltage construction on the customer's property.

Electricity Industry Participation Code 2010, Part 6 Connection of Distributed Generation: Regulations for connection of distributed generation to electricity distribution networks.

Electricity retailer: An electricity retailer (sometimes referred to as a 'power company') purchases electricity from the wholesale market to sell to residential and business users. Eight electricity retailers currently operate on the Buller Electricity distribution network – Contact Energy, Glo Bug, Energy Online, Genesis Energy, Meridian Energy, Mighty River Power, Pulse Energy and TrustPower.

Fault: A physical condition that causes a device, component, or element of the electricity supply network to fail to perform in the required or intended manner.

Generation customer islanding: Generation will automatically isolate from the network and only supply a local load (normally emergency supply within a building).

Generation network islanding: Generation network islanding occurs when a fault on the network is isolated by network switches and the generation continues to supply power to the isolated network.

Generation islanding protection: A complex protection system that detects an islanding condition (generation network islanding) and executes prescribed generation control and isolation functions.

Import/Export of electricity: Refers to the direction in which the electricity flows through the point of connection (and the meter). If no generation exists at a premises then energy will always be imported from distribution network, while surplus energy generated at a consumers premises is exported into the distribution network.

Installation: A complete electrical installation from the point of a service main connection to the network, to the most remote circuit supplied by the switchboard.

Installation control point (ICP): For each point of connection on a distribution network (or an embedded network) the distributor nominates a point at which a retailer will be deemed to supply electricity to a customer. Each ICP is assigned a unique code (termed the ICP number) which is used to identify the ICP.

Installed capacity: The electrical size of the system. A 1kW system can supply 1kWh (or one unit) of electricity in an hour.

Intermittent generation: Generation for which the source is intermittent and not easily predicted, e.g. wind or wave generation.

Inverter: An electronic device that converts DC electricity to AC electricity.

Kilowatt-hour (kWh): A kilowatt-hour is also known as a unit of electricity and is the basis of retail sales of electricity.

Meter: Equipment that measures the quantity of electricity, usually in kilowatt-hours (kWh).

Micro hydro: Small water-powered generation systems, typically able to operate on low head pressure sources.

Net billing: The effective result of the cost of purchased electricity being offset by the cost of sale received for any exported electricity.

Network connection standard: Buller Electricity's Network Connection Standard outlines technical requirements for connections to our network.

Network: A network (also called an electricity distribution network) is the lower voltage power lines and other assets in a local area which are used to carry electricity from the national grid to homes and businesses.

Peak period: Period during which Buller Electricity operates its load management system to control network peaks.

Photovoltaic panels: Silicon panels that convert sunlight to DC electricity.

Point of Connection: The point at which a Consumer's premises connects to the distribution network (ownership boundary).

Spot market: The buying and selling of wholesale electricity is done via a 'pool', where electricity is offer electricity to the market and retailers bid to buy the electricity. This market is called the spot or physical wholesale market.

Spot price: The half-hour price of wholesale electricity.

Time of use metering: Metering that records the amount of energy either imported, exported, or both, in half hour time segments.

Transpower: The state-owned enterprise that operates New Zealand's transmission network. Transpower delivers electricity from large-scale electricity generation to electricity distribution networks around the country.