

Connection and Operation of Distributed Generation (>10kW)

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1. INTRODUCTION

This document has been prepared to assist people who are considering installing and connecting medium to large (greater than 10kW) distributed generation equipment to the Scanpower electricity network. Generation that is connected to the local distribution network rather than the national grid is normally referred to as distributed generation. Any consumer, depending on their location and their connection to the distribution network, can generate and potentially export electrical energy from their installation. Distributed generation rated at greater than 10kW capacity would typically be powered by a hydro or wind turbine, or a larger solar array.

The connection of distributed generation is regulated by Part 6 of the Electricity Industry Participation Code, and more information is available on the Electricity Authority's website www.ea.govt.nz If you are planning to install distributed generation equipment that is connected either directly or indirectly to Scanpower's network and would be capable of exporting electricity into the Scanpower network, at either a new or existing installation, it is preferable that you discuss your intentions with us as soon as possible. This will ensure that any issues can be resolved before you submit a formal application.

Distributed generation must comply with all of the relevant statutory and regulatory requirements and safety standards. It is also essential that the connection of distributed generation to our network does not compromise the safe and efficient operation of the network, the safety of staff or contractors working on the network, or the general public.

This information does not apply to generation that is not connected (either directly or indirectly) to the Scanpower network.

For information pertaining to small distributed generation installations refer to the "Connection and operation of generation rated at less than 10kW capacity" document.

1.1 DEFINITIONS

Connection assets means assets such as (but not limited to) lines, poles, transformers, cables, fuses, reclosers or circuit breakers necessary to connect generation to our network.

Code means the Electricity Industry Participation Code as published and updated from time to time on the Electricity Authority's website www.ea.govt.nz

Fuel means the primary energy source for your distributed generation, which may include wind, water or sunlight as well as commonly understood fuel such as diesel.

Part 6 means Part 6 of the Code as published and updated from time to time on the Electricity Authority's website.

Regulated terms means the terms and conditions set out in Schedule 6.2 of Part 6.

Requirements means the requirements referred to in Section 2 of this document.

We, us, our, ours and similar words means Scanpower Ltd.

You, your, yours and similar words means the party wishing to connect distributed generation to Scanpower's network.

2. CONNECTION REQUIREMENTS

2.1 SAFETY REQUIREMENTS

Your generation system could pose a serious safety hazard if it continued to export energy into our network during an outage. This would compromise the safety measures implemented by anyone working on the network and may also damage your equipment. All wiring associated with the system must be undertaken by a registered electrician and comply with the following safety requirements:

- The specific requirements contained in the Electricity (Safety) regulations 2010.
- AS/NZS 3000 Wiring Rules.
- EEA Draft Guide for the Connection of Generating Plant.
- The general requirements contained in the Health & Safety in Employment Act 1992.

Systems manufactured to AS4777.2 and with protection systems installed as per AS4777.3 will provide suitable isolation.

We would prefer that your point of connection to our network includes a means of isolation that has a visible disconnection that can be seen from ground level.

2.2 TECHNICAL REQUIREMENTS

Your generation system must comply with our Network Connection Standard NS 05/05 that is available on our website www.scanpower.co.nz, and the following technical standards:

- AS 4777.2 2002
- AS 4777.3 2002
- AS/NZS 3000.
- The harmonic interference standards specified in NS 05/05.

If your generator will be connected through an inverter, you will need to visit the [Approved Inverters sub-page](#) of our website to ensure that your proposed inverter is approved for connection to our network.

2.3 OPERATIONAL REQUIREMENTS

Your generation must include a switch or circuit breaker that disconnects and locks out if mains voltage is lost on our network or if the mains frequency dips below 49.5Hz for more than 2 seconds. This is to ensure that our network is not back-livened from your generation which would create a safety hazard for our faults staff.

Clear and durable notices must be prominently posted near the point of connection to our network, and at your switchboard and meter box stating that there is connected generation. This is to warn people of the possibility that your installation could still be live even if the mains have been disconnected.

In the areas of our network protected by auto-reclosing devices your generator must not attempt to reconnect during the reclosing sequence. This will require an auto-restart delay of 1 minute following restoration of mains voltage.

2.4 COMMERCIAL REQUIREMENTS

You must have a contract in place with a retailer for the purchase of the energy you generate, or provide evidence that you will be consuming all this energy yourself. You may not simply “lose” the energy in our network or use our network as a “dummy load”, however you may “gift” your exported electricity to the market as set out in Clause 3.1 of the Electricity Authority Guidelines.

As we are a lines business and not an energy business we cannot purchase the energy from your generation.

Your energy retailer will need to determine the quantity of energy exported from, and the energy imported into, your installation which will require additional metering to be installed. Your energy retailer will normally arrange for this additional metering equipment and advise you of any rental or associated charges.

2.5 ELECTRICITY INDUSTRY PARTICIPATION CODE REQUIREMENTS

You should also download and read the Regulated Terms & Conditions from the Electricity Authority’s website, and understand how those terms and conditions will apply.

2.6 OTHER REGULATORY REQUIREMENTS

You may also need to liaise with your district or regional council and other agencies to ascertain whether resource or building consents are required. Micro hydro systems may require resource consents from the Regional Council to divert water or alter waterways, whilst erection of a mast for a wind turbine may require planning consent. Scanpower does not deal with building or planning consent issues.

2.7 CIRCUMSTANCES UNDER WHICH WE MAY CURTAIL YOUR GENERATION

Under conditions similar to the following we may curtail, interrupt or disconnect your generation...

- If the safe operation of our network, including public safety, requires disconnection
- If, in our opinion, your generation has become technically or operationally unsafe including breaching the specific safety requirements.
- If, in our opinion, your generation is interfering with the notional 50Hz voltage or current waveforms on our network including but not limited to by imposing spikes, surges, sags, flicker, harmonics or creating phase imbalances.
- If we believe you have breached any connection terms & conditions.

We may curtail, interrupt or disconnect your generation without notifying you if technical, safety or operational issues require.

2.8 NETWORK CONSTRAINTS OR CONGESTION

Refer to the [Network Congestion](#) webpage for the areas of our network that are or are expected to become congested or constrained.

2.9 LIMITING THE DENSITY OF GENERATION

Our network was originally designed to distribute electricity in one direction from large grid substations. Due to the rural nature of much of our network, medium to large generators will have a significant impact on its operation. We therefore reserve the right to decline an application to connect any generation to our network if we believe that installing generation in that area could interfere with the operation of our network or with our customers' quality of supply. In the event that we receive more than one application to connect generation to part of our network the Regulations allow us to treat those applications as competing bids for limited capacity as long as we consider the overall purpose of the Regulations.

It is almost certain that in some locations on our network your generation will exceed our minimum base load and result in injection of surplus energy into the transmission grid. In these circumstances both you and us will be required to comply with Transpower's connection standards, terms and conditions. This may require Transpower to upgrade their assets for which they have their own processes, response times and charging methodologies.

2.10 CHANGE OF OCCUPANCY OR OWNERSHIP

It is important that any new owner or occupant of a premise involving distributed generation is aware of the safety, technical, operational and commercial aspects. Accordingly you must advise us of any new occupant or owner so we can discuss their obligations with them.

2.11 CONFIDENTIALITY OF YOUR APPLICATION

The Regulations allow us to divulge the broad details (but not necessarily the ownership details) of generation applications to other applicants whose generation might be affected by your generation.

In turn, we may provide you with information about our network that is confidential. If you do not agree to keep any such information confidential, Schedule 6.1 of Part 6 of the Code allows us to refuse to process your application.

2.12 POSSIBLE INJECTION INTO TRANSPOWER'S NETWORK

At certain times our network can be very lightly loaded, and it is therefore possible that DG of about 200kW or greater could be injecting electricity into the Transpower grid through our network. If we consider that to be a possibility, we may require you to discuss your proposed DG with Transpower who have their own procedures for considering generation connection.

3. NETWORK ACCESS COSTS

3.1 NETWORK ACCESS

Our policy is to facilitate access to the network for anyone who meets the applicable safety, technical, operational and commercial requirements and who agrees to pay the applicable charges.

The details of our current involvement and experience with distributed generation are described in our Asset Management Plan which can be downloaded from our website.

3.2 FUNDING AND OWNERSHIP OF CONNECTION ASSETS

Connection of your generation to our network may require the installation of additional assets, such as a few spans of line, additional conductors, or a disconnecter etc. These assets are referred to as connection assets and will be funded by you but may be vested in us. In addition, all new connections to our network, whether they are used for off-take or injection purposes, are charged a Connection Levy based on the maximum capacity requirement in kW of the connection when used for either off-take or injection (but not both). This levy allows us to fund capacity upgrades of the core network assets shared by all users.

If your generation capacity is greater than the capacity of the local 400V system you will be expected to fund the cost of any dedicated equipment required to connect your distributed generation at 11kV. This equipment may be provided by us for an annual charge, or you may choose to provide and own your own equipment as long as it complies with our network design and construction standards.

Lines or cables installed on your property, or on property over which you have a right or easement to convey electricity will be owned by you with the exception of the revenue meters and transformer which may be owned by other parties. By regulatory default the connection point to our network is where these dedicated assets cross your property boundary.

Additional assets installed to extend our network to your point of connection will be owned by us if they are located on the road reserve or other public property. Although these assets will be funded by you, they will become part of our network and we will assume all the usual ownership responsibilities and obligations.

3.3 FUNDING TECHNICAL MODIFICATIONS

You may also need to pay for any technical modifications such as recalibrations of protection or control equipment.

3.4 APPLICATION FEES

We may charge a fee for performing various tasks related to your DG application, subject to the following maximum fees set out in Part 6 of the Code:

Application fee	Between 10kW and 100kW	\$500 excl. GST
	Between 100kW and 1MW	\$1,000 excl. GST
	Above 1MW	\$5,000 excl. GST
Observing tests and inspecting	Between 10kW and 100kW	\$120 excl. GST
	Above 100kW	\$1,200 excl. GST

3.5 RESPONSIBILITY OF DG OWNERSHIP/OPERATION

The owner/operator of a distributed generating system shall ensure:

- Maintenance and safe operation of the generating system (including inverters, protection devices, cabling etc.)
- The generation system complies with all relevant Acts, Regulations, Codes and Rules.
- Operating the system within the net output level specified in the Network approval.

4. CONNECTION PROCESS

4.1 STEP #1 (YOUR INITIAL APPLICATION)

To begin the connection process you must provide us with the following information in writing although we would prefer that you phoned us to discuss your intentions first. Please use Form 2 in Appendix 1 at the back of this document and include additional pages as required to specify:

- The technical specifications of the equipment that will disconnect your generation from our network if mains voltage is lost.
- Exactly where you expect to install your generation.
- Whether your generator is 1-phase or 3-phase.
- The exact point and voltage at which you propose to connect to our network.
- Evidence that your generation will meet the requirements set out in Section 2 of this document and on the Generation pages of our website.
- What type of generation you intend to connect (hydro, photo-voltaic etc).
- The manufacturers' rating of your generator.
- The configuration of your proposed generation, in particular whether your generator is a new generator or an addition to an existing generator. If your proposed generator is an addition, the rating of your entire installation at a single point of connection to our network must be disclosed in your application.
- The technical specifications of your generator and associated equipment so that we can assess the likely impact on our network and our other customers.
- The technical specifications of the equipment that will disconnect your generation from our network if mains voltage is lost.
- Exactly where you expect to install your generation.
- Whether your generator is 1-phase or 3-phase.
- The exact point and voltage at which you propose to connect to our network.
- Evidence that your generation will meet the requirements set out in Section 2 of this document.
- Your completed Form 2 will need to be accompanied by the payment set out in Section 3.4 above plus GST payable to Scanpower Ltd. If your completed Form 2 does not provide sufficient information for us to determine if your proposed generator meets the standards set out in Section 2 of this document, we may ask you for further information.

4.2 STEP #2 (OUR RESPONSE TO YOUR INITIAL APPLICATION)

Upon receiving your Initial Application, we are required to advise you within 5 working days whether your Initial Application is complete. If your Initial Application is incomplete we will advise you of the information you will need to include when you reapply.

Within 30 days of receiving a correctly completed Initial Application the Code requires us to provide you with the following information (much of which is already on our website):

- (a) Information about the capacity of the distribution network, including both the design capacity (including fault levels) and actual operating levels.

- (b) Information about the extent to which connection and operation of the distributed generation may result in a breach of the relevant standards for safety, voltage, power quality, and reliability of supply to our connected customers and other generators.
- (c) Information about any measures or conditions (including modifications to the design and operation of the distribution network or to the operation of the distributed generation) that may be necessary to address the matters referred to in points (a) and (b) above.
- (d) The approximate costs of any network-related measures or conditions identified under point (c) above and an estimate of time constraints or restrictions that may delay the connecting of the distributed generation.
- (e) Information about any further detailed investigative studies that we reasonably consider are necessary to identify any potential adverse effects on our network resulting from the proposed connection, together with an indication;
- (1) Whether we agree to the generator, or a suitably qualified agent of the generator, undertaking those studies; or
 - (2) If not, whether we could undertake those studies and, if so, the reasonable estimated cost of the studies that the generator would be charged.
- (f) Information about any obligations to other parties that may be imposed on us and that could affect the 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 the generator's application.
- (h) Information about the extent to which planned and unplanned outages may adversely affect the operation of the distributed generation.

You may also make written requests for information such as single line diagrams, equipment ratings, normal switch configurations (including fault levels), and protection system details relevant to the proposed point of connection. We are required by the Code to provide such information within 10 days of receiving your written request.

If either you or we become aware of new information that is relevant to your application, that party must make reasonable endeavours to pass that information to the other party.

4.3 STEP #3 (YOUR FINAL APPLICATION)

You can make a Final Application to connect your generation at any time within 12 months of receiving the information set out in Section 4.2 above. Your Final Application must include the correctly completed Form 3 (at the back of this document) and copies of any technical studies that we have asked you to undertake.

When we receive your correctly completed Final Application we are required by the Code to make reasonable endeavours to notify the following people within 10 working days in writing;

- Everyone who has made an initial application to connect generation to a part of our network that we believe could be affected by your Final Application.
- All DG greater than 10kW connected to that part of our network on the regulated terms and conditions that could be affected by your generation.

If we receive a Final Application from another generator within 20 working days of receiving your Final Application, we may consider the two Final Applications as competing bids for limited connection capacity as long as we keep the overriding principles of Part 6 in mind otherwise we must treat final applications on a “first come, first served” basis. Otherwise the Code requires us to treat Final Applications on a “first come, first served” basis.

Upon receiving a correctly completed Final Application from you that includes evidence that your generation will meet all safety requirements, all statutory requirements and our technical and operating requirements, we must do one of the following three things within 45 working days (or within 60 working days for generation between 1MW and 5MW, or within 80 working days for generation greater than 5MW)...

- Provide written notification that your Final Application has been approved with no additional conditions.
- Provide written notification that your Final Application has been approved but with additional conditions. In such a case we must set out the conditions in detail, state why those conditions are necessary, specify any charges payable by you, and advise you of how you can challenge our decision under the dispute resolution process set out in Schedule 6.3 of Part 6 of the Code.
- Provide written notification that your Final Application has been declined. In such a case we must advise you why your Final Application has been declined, how you can re-apply, and how you can challenge our decision under the dispute resolution process set out in Schedule 6.3 of Part 6 of the Code.

We may also ask you in writing for 1 or more extensions of up to 40 working days to process your final application which you cannot reasonably refuse.

4.4 STEP #4 (YOU GIVE NOTICE TO PROCEED)

If we approve your Final Application to connect generation, you must advise us in writing within 30 working days whether you intend to connect your generation, although we can extend this period at our discretion.

This written notice of intention to proceed must include the details of your generation as submitted in your Final Application and confirm your acceptance of any conditions that we may have imposed on your connection. If you do not accept any conditions we may have imposed, but still wish to proceed with the connection, you must notify us of this dispute within 30 working days.

If you do not provide such written notice, our obligations under the Code cease and your application effectively lapses. You can however make a new Initial Application.

4.5 STEP #5 (NEGOTIATE CONNECTION CONTRACT)

Once you have notified us in writing of your intention to connect your generation, we have 30 working days (starting from the date at which we receive your written notice of intention to connect) to mutually negotiate a connection contract. This period can be extended by mutual agreement.

If we cannot agree with you on mutually acceptable connection terms and conditions within the allowable 30 working days then one of the following will apply:

- If your application is to connect generation, we must allow you to connect on the regulated terms and conditions set out in Schedule 6.2 to Part 6 of the Code once you have complied with all the conditions we have specified.
- If your application is to continue an existing connection, the regulated terms & conditions set out in Schedule 6.2 to Part 6 of the Code will apply from the later of:
 - The end of the 30 working day period for negotiating a connection contract, or
 - The expiry of your existing connection contract, or
 - The date on which you fully comply with any conditions set by us.

- If your application is to continue an existing connection that doesn't have a connection contract, the regulated terms & conditions set out in Schedule 6.2 to Part 6 of the Code will apply from the later of:
 - The end of the 30 day working period for negotiating a connection contract, or
 - The date on which you fully comply with any conditions set by us.
- If your application is to change the nameplate capacity or fuel type of an existing generator, the regulated terms & conditions set out in Schedule 6.2 to Part 6 of the Code will apply from the later of:
 - The end of the 30 day working period for negotiating a connection contract, or
 - The date on which you fully comply with any conditions set by us.

4.6 STEP #6 (WE CONNECT YOUR GENERATION)

Before your generation is connected to our network, you must arrange for it to be inspected and tested. We will require sufficient prior notice to arrange for our staff to be on site to observe these tests. Our charges for observing these tests and inspections are set out in Section 3.4.

You must also provide us with a comprehensive test and inspection report that includes confirmation that any metering will fulfil its intended purposes.