



C O U N T I E S P O W E R

Currently being reviewed and updated

Distribution Code

Part 4: Distributed Generation Requirements

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Distribution Code – Part 4: Distributed Generation Requirements

1.0 Introduction

This document provides information to those parties wishing to install distributed generation which connects into the Counties Power network.

It is relevant to all stakeholders including electricity retailers, electricity users, developers, contractors, consultants and shareholders.

This standard forms part of our Distribution Code, which comprises six parts, all of which are available from Counties Power's website www.countiespower.com, each covering a specific set of requirements

Part 1: General Requirements

Part 2: Network Connection Standard

Part 3: Metering Requirements for Electrical Installations

Part 4: Distributed Generation Requirements (this document)

Part 5: Signalling and Technical Interference

Part 6: Distribution Operation Code

Definitions of terms and abbreviations are found in section 14.1 of Part 1 of this code.

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2.0 Introduction to distributed generation

Distributed generators, also known as ‘embedded generators’, are generators located at a home or business which are capable of generating electricity for that home or business’s own use. They may also be capable of putting surplus electricity back into Counties Power’s electricity distribution network. These generators can take many forms; diesel generators, wind turbines and solar panels are the most common but the term covers any form of plant that has the potential to feed electricity back into the network.

The Electricity Authority (Established under the Electricity Act 2010) is responsible for the Electricity Industry Participation Code (EIPC) 2010 which covers all parties connected to the electricity system. In this document this is referred to as “The Code”.

Counties Power requirements, included in this document, follow the regulated terms for connection of distributed generation to its network as per [Schedule 6.2](#) of The Code.

In addition to the Counties Power requirements in this document there are other aspects of The Code that generators are required to comply with and it is recommended that generators planning to inject more than 1MW of capacity review the full requirements of the code.

In particular, it is noted that all generation in excess of 1MW must directly notify the system operator (Transpower) of their intentions. To ensure that all matters are properly coordinated, Counties Power must be copied in on all correspondence with the system operator.

3.0 Application of these Requirements

The requirements in this document apply to any generation that is connected such that it could feed back into the network.

Please note that Counties Power does not need to be informed about generation systems which will **not** be connected to the electricity network. This includes arrangements when the generation can be switched to supply an installation where there is an appropriate “mid-point-off changeover switch” to mechanically and electrically prevent the generator feeding back into the network.

4.0 Interference from Generation Plant

Counties Power Distribution Code Part 5 - Technical Interference Requirements provides information relating to the impact of connections to the quality of the

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supply provided to all customers and the limits of interference (waveform distortion) that apply to distributed generation.

5.0 Requirements for Distributed Generation

The requirements for consumers to operate distributed generation follow below. These guidelines are separated into two categories:

- small distributed generation systems (10 kilowatts or less).
- medium to large distributed generation systems (above 10 kilowatts)

5.1 Small Distributed Generation Systems (10 kilowatts or less)

The first step is for the installer/owner to complete the Distributed Generation application form (DG1) and submit this to Counties Power for processing. Form DG1 can be sourced by clicking the link or referring to Appendix A.

There is a list of pre-approved inverters in Appendix C. If the inverter is on this list, the application will be processed faster. If the inverter is not pre-approved, additional information on how the distributed generation device meets both the AS4777 standard and this Distribution Code will be required.

Applications should be reviewed by Counties Power within 2 business days with a written response that the application has been received. If the application is incomplete, the applicant will be notified that more information is required to be provided within 10 business days.

A full response in writing is to be provided by Counties Power within 30 business days of receiving a fully complete application, except where using an inverter which has been pre-approved when the response should be within 10 business days.

An application may be declined if the Distributed generation device does not meet AS4777 standards and/or Counties Power Network Standards or the Information relating to the application is incomplete.

After approval of an application to connect a distributed generation device it may be installed on the Counties Power network. The connection will be governed by the Electricity Authority's Regulated Terms.

The installer will complete the work and issue a certificate of compliance (COC) and then arrange for a registered inspector to test and inspect your installation. The applicant must notify Counties Power 5 business days prior to the testing, as Counties Power may send a qualified technician to observe the testing of the installation. The registered inspector will issue a Record of Inspection (ROI) if the installation has

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passed all regulated checks. A copy of the COC and ROI must be provided to Counties Power within 10 business days of the installation being inspected.

In parallel with the above connection process the owner will need to arrange, and maintain, a contractual arrangement with an electricity retailer in order to have a meter installed at the site. This will allow for the purchase of additional electricity and the sale of any excess generated electricity.

A list of Electricity Retailers operating on the Counties Network is provided in appendix D.

Distributed generation devices cannot be operated until a meter is installed at the site. The contracted electricity retailer will nominate a Meter Equipment Provider (MEP) who is responsible for installing a meter at the site.

The MEP will require a copy of the Certificate of Compliance (COC) and the Record of Inspection (ROI) for your installation before they can install a meter at the site.

If Counties Power is chosen as the MEP an electrical inspector will be sent to the site within 5 business days to install the electricity meter. Where all the electrical requirements are satisfied, the site will be lived in for use.

5.1.1 Rural Area Connections

Counties Power Network Connection Standard (Part 2 of the Distribution Code) specifies that:

*“Supply to rural dwelling installations is recommended to be three phase and **shall** be a minimum of two phase and the connected load balanced across all connected phases at the Main Switchboard”.*

When a small-scale distributed generation system is installed in a rural area where a three phase or two phase supply is provided, then the generation is required to inject equally into all phases to maintain a balanced load.

5.2 Medium to Large Generation Systems (above 10kilowatts)

5.2.1 General Conditions and Process

Then first step is for the installer/owner to complete the [DG2 application form](#) and submit this for processing. Form DG2 can be sourced by clicking the link or referring to Appendix B.

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A distributed generation over 10 kilowatts is likely to take some time to connect due to the complexity of a connection this size. As outlined by the Electricity Authority the following timeframes are likely to apply:

- Counties Power will review your application within 5 business days, and send a written response that your application has been received. If your application is incomplete, Counties Power will notify you that more information is required. In some circumstances a team member from Counties Power may contact you to discuss your distributed generation application.
- Counties Power also commits to providing information in support of your application within the timeframes outlined by the Electricity Authority as specified in Part 6, Schedule 6.2 of the Electricity Code.
- After the approval of your application, you must give written notice to Counties Power within 30 business days confirming whether you want to proceed with the distributed generation system and providing confirmation of the following:
 - Final details and specification of the distributed generation system
 - Acceptance of all imposed conditions (or other measures) that Counties Power specified.

The notice can be extended and disputes resolved under Part 6 of the Code. Please note that if you choose not to proceed and reapply later to connect the same generation, an application fee may be charged.

- Counties Power has 30 business days to negotiate a connection contract with you after you notify Counties Power in writing of your intention to proceed

If your application to connect a distributed generation device has been approved, you are permitted to have your distributed generation device installed on the Counties Power network. Your connection will be governed by the Electricity Authorities Regulated Terms.

When your installer has completed the work they will issue a certificate of compliance (COC) and then arrange for a registered inspector to test and inspect your installation. Counties Power must be notified 5 business days prior to the testing, as Counties Power may send a qualified technician to observe the testing of your installation. The registered inspector will issue a Record of Inspection (ROI) if the installation has passed all regulated checks. A copy of the COC and ROI must be provided to Counties Power within 10 business days of the installation being inspected.

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In parallel with the above connection process the owner will need to arrange, and maintain, a contractual arrangement with an electricity retailer in order to have a meter installed at the site. This will allow provide for the purchase of additional electricity and the sale of any excess generated electricity.

A list of Electricity Retailers operating on the Counties Network is provided in appendix D.

You are not permitted to operate your distributed generation device until a meter is installed at your site. Your contracted electricity retailer will nominate a Meter Equipment Provider (MEP) who is responsible for installing a meter on your site.

The MEP will require a copy of the Certificate of Compliance (COC) and the Record of Inspection (ROI) for your installation before they can install a meter at your site. If Counties Power is chosen as the MEP we will send an electrical inspector to your site within 5 business days to install your electricity meter. Where all the electrical requirements are satisfied, your site will be livened for use.

5.2.2 Specific Technical Connection requirements

- Generators above 300kVA shall have characteristics of synchronous generators.
- Small wind farms above 300kVA connected to our distribution system shall have a static compensator.
- Variable speed drives with rated current greater than 16A shall have active mitigation of harmonics.
- Larger generators (injecting over 1000kW) may be subject to additional terms and conditions specified under The Code by the “System Operator” (Transpower). (Refer Appendix E for additional information).
- Distributed generation must meet all relevant statutory and regulatory requirements and comply with all applicable safety standards, including the Standards Electrical Code of Practice AS/NZS 3000 – Electrical Installations (known as the Australian/New Zealand Wiring Rules).

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- For systems connected to the Counties Power network via an inverter the system should be manufactured to Australian Standard 4777.2¹ and with protection systems installed in accordance with the Australian Standard 4777.3.

5.2.3 Generator Control Arrangements

It is preferred that distributed generators are not subjected to despatch and export reactive energy (kVAh) 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. (See following sections regarding Protection and Distributed Generation Network Islanding for islanding detection requirements).

Counties Power will advise if continuously acting fast response automatic excitation and/or governor control systems are required to control the generator voltage and frequency without instability over the entire operating range of the generator. This will depend on the size and type of the generator and the characteristics of the part of our network to which it is connected.

For generation over 1MW voltage and frequency requirements may be specified by the system operator (Transpower), however Counties Power may also specify requirements to meet the actual local network connection point conditions. If there is a conflict between requirements, then the more restrictive settings will apply.

5.2.4 Protection

The generator must be equipped with the appropriate protection elements as required by the EEA Guide for “Connection of Generating Plant (Guide)”.

Owners and installers must consult Counties Power with regard to any special arrangements or protection that may be necessary due to the characteristics of our network.

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

It will be necessary for the protection associated with embedded generating plant to co-ordinate with the protection associated with Counties Power’s distribution system as follows:

¹ Australian Standard AS 4777 - 2005 Grid Connection of Energy Systems via Inverters

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- a. For generating plant directly connected to Counties Power distribution system, the generator must meet the target clearance times for fault current interchange with Counties Power's distribution system in order to reduce to a minimum the impact on Counties Power's distribution system of faults on circuits owned by generators. Counties Power will ensure that their protection settings meet its own target clearance times. The target clearance times are measured from fault current inception to arc extinction, and will be specified by Counties Power to meet the requirements of the relevant part of the distribution system.
- b. The settings of any protection controlling a circuit breaker, or operating values of any automatic switching device at any point of connection with Counties Power distribution system, shall be agreed between Counties Power and the user, in writing, during the connection consultation process. The protection settings or operating values shall not be changed without the express agreement of Counties Power.
- c. It will be necessary for the generating plant protection to co-ordinate with any auto-re-close policy specified by Counties Power.
- d. Any generating unit or power station connected to Counties Power's distribution system will be required to withstand, without tripping, the negative phase sequence loading incurred during the clearance of a close-up phase-to-phase fault by system back-up protection which will be within the plant short time rating on Counties Power distribution system. Counties Power will advise the generator of the expected negative phase sequence loadings during the Connection Agreement process.

There may be additional protection requirements specified by Transpower if the level of power injected by the generator is such that it may flow back into their system (as opposed to it being consumed by the local loads on the Counties Power system). This will be identified as part of the generators notification to Transpower as system operator of generators injecting greater than 1.0MW.

5.2.5 Distributed Generation Network Islanding

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

Distributed generation network islanding occurs when a fault on our network is isolated by network switches and the generator continues to supply power to the isolated network. Generators will disconnect from the Counties Power network, but may continue to supply load within their own installation during a network outage (i.e. creating their own island).

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Managing safety for operations and people becomes an issue with 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.

If no facilities exist for the subsequent resynchronisation with the rest of Counties Power's distribution system then the embedded generator will, under our instruction, ensure that the generating plant is disconnected for resynchronisation.

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

5.2.6 Black Start Capability

It will be necessary for each embedded generator to notify Counties Power if its generating plant has a restart capability without connection to an external power supply.

5.2.7 Commissioning Tests

Where generating plant requires connection to Counties Power's distribution system in advance of the commissioning date, for the purpose of testing, the generator must comply with the requirements of the Connection Agreement. The generator shall provide Counties Power with a commissioning programme, approved by Counties Power if reasonable in the circumstances, to allow commissioning tests to be co-ordinated.

6.0 Safety Requirements

In order to ensure that public safety is maintained, all distributed generators are required to ensure that their generators and their operation do not present a significant risk of serious harm to any member of the public or significant damage to property of any member of the public, connections to the network shall comply with public safety standards as required by *Section 61A* of the [Electricity Act 1992](#) and *Regulation 47 Works Covered By Audited Safety Management Systems* of the [Electricity \(Safety\) Regulations 2010](#).

Once you have finalised your distributed generation design, Counties Power will need to review it before Counties Power will allow it to connect to our network. As with any new or altered electricity connections, Counties Power will need to see an

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Electrical Safety Certificate and Certificate of Compliance for the installation before it can be connected.

The distributed generator must comply with the requirements of the Health and Safety at Work Act 2015.

Distributed generators are also required to ensure that their generators and their operation do not present a significant risk of serious harm to any member of the public or significant damage to property of any member of the public. To ensure compliance, generators are requested to carry out their own safety checks regularly using the recommended self-assessment PSMS Toolkit available from the EEA website. Such areas are electrical protection during a generator fault and the back-feed of electricity into the network during a shutdown. The recommended time-frame is bi-annual safety checks.

7.0 Congestion, Curtailment and Interruption of Generation

The electricity network is currently set up for electricity flow in one direction only. Increased distributed generation could introduce bi-directional electricity flow on the network and lead to congestion of its low and high voltage networks. Network congestion will cause a network asset to operate beyond its rated capacity or give rise to a high voltage at the point of connection to the network.

In order to manage network congestion, Counties Power ensures that distributed generation is only connected in unconstrained areas and will upgrade the network where necessary to meet requirements. (Charges may be made to achieve this). Counties will also implement real-time operational curtailment rules and arrangement on a need basis as well as on a case-by-case basis.

The network congestion measure will be dependent on the extent of congestion, technical and operational characteristics, and connection terms and conditions. The additional costs will be allocated based on a pro-rated share of reinforcement costs following its capital contribution policy.

In the event of a fault on a distribution feeder, any distribution generator must be automatically disconnected from the network via its own protection. The customer has sole responsibility for the safety of their generating plant and equipment under such conditions.

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8.0 Network Support

8.1 Network Support Service and Avoided Cost of Transmission (ACOT)

Where incremental costs are negative the Generator is deemed to be providing “Network Support Services” and may invoice Counties Power for this service. It should be noted that Counties Power’s Network is constructed to provide for the known loads at the time with spare capacity for future growth. The known (requested) load for each ICP is limited by the protection at the Point of Isolation. If without the Generator operating, Counties Power’s Network shows signs of being unstable, but with the Generator operating there is a noticeable effect on the stability of the network, then in this instance the Generator is deemed to be providing Network Support Services.

Therefore, where a Generator is connected under the Electricity Industry Participation Code 2010 and,

- can provide evidence to Counties Power that the Generator is providing “network support services” to Counties Power’s network as described above,
- complies with all relevant obligations under these Regulations (and in respect of Tax), the Generator may invoice Counties Power for this network support services (ACOT).

ACOT is directly related to the kVA exported from the Generator into the Network. For example, if the Generator is rated at 2MW but is exporting at 1MW during the “peak period”, it is this exported figure (1MW) that would be used to calculate ACOT.

The “Energy” Exported by the Generator is accounted for via the export meter which is reconciled by the Generators nominated method, i.e. Retailer. Where a Generator is already connected to Counties Power’s network (and not currently receiving ACOT), any benefit via reduced Transpower interconnection charges, has already been passed through to customers. To this end, for Counties Power to pay an existing Generator ACOT, Counties Power would have to increase its charges. Therefore, the window for Counties Power to factor any Generator benefit (ACOT) is in November/December for implementation 1 April the year following. For the avoidance of doubt, for existing Generators, ACOT will be determined as outlined in 2 below, and applied effective from 1 April in the forthcoming price year i.e. ACOT will not be applied retrospectively.

8.2 Requirements of receiving ACOT payments

ACOT will only be paid for Generators which export into Counties Power’s Network, with an exporting capacity over and above 1MW and if the Generator is deemed to be supporting Counties Power’s network. Where the Generator is deemed to be

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providing the Network Support Services the Generator should provide the data in the required format to Counties Power for payment of ACOT in the following way:

- (a) Ensure that the data provided has been audited by a Qualified Independent Auditor approved by Counties Power
- (b) Provide to Counties Power the data as outlined below by Business Day 5 in December each year
- (c) Invoice Counties Power monthly from the following April each year.

Monthly data obtained from year one of operation will be used to make up the invoice to Counties Power during year two of operation. If a Generator changes hands during, or at the end of, an operating year the payments made to the Generator for the generation during that Capacity Measurement Period will be paid to the Generator operating during that period.

8.3 Method of Calculating ACOT

- (a) From April 2019 ACOT will be paid in the following way:
 - (i) The Annual Interconnection Charge that Counties Power pays to Transpower is determined from Counties Power's demand offtake at the GXP coincident with the Regional Peak Demand Periods occurring during the Capacity Measurement Period relevant for the applicable Pricing Year.
 - (ii) ACOT will not be paid to the Generator until electricity from the Generating Station is generated within the Capacity Measurement Period relevant for the applicable Pricing Year.
 - (iii) ACOT will be a fixed amount each year, using the Regional Peak Demand Periods and Regional Coincident Peak Demand applicable for the GXP and as notified by Transpower during the Capacity Measurement Period for the applicable Pricing Year.
 - (iv) Paid in 12 equal portions by the 20th day of each month during the Pricing Year to the Generator.
 - (v) ACOT is determined by multiplying Transpower's published Interconnection Rate and an Interconnection Adjustment Factor ("IAF"). The calculation for determining the annual ACOT for an individual DG is as follows:

$$\text{ACOT} = (\text{RCPDDG} \times \text{Interconnection Rate} \times (1 - \text{IAF})) - \text{Administration Fee}$$

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The IAF is an adjustment that is applied to ensure only Counties Power's incremental cost of security is calculated, as there are many costs associated with any Distributed Generation connected to a distribution network e.g. voltage transients, power factor and reliability issues. The Administration Fee is Counties Power's estimate of the administrative costs in determining the ACOT, recovering the ACOT from end-consumers and distributing the ACOT to the Generator.

- (b) The Generator agrees that any payment due to the Customer in respect of the ACOT payment may be netted off by Counties Power against any Network Charges due and payable by the Generator to Counties Power. If, at any time while the Distributed Generation connection is connected to Counties Power's network, and Transpower changes its pricing methodology such that the ACOT calculation method described in clauses above is or will become obsolete, the parties agree that Counties Power shall nonetheless pay the Generator the ACOT amount determined that is applicable in that Pricing Year. Following which, ACOT determination will be on the basis of the new Transpower methodology.
- (c) Refer to the current Counties Power Pricing methodology for charges relating to the export of energy into the CP network.

8.4 Data Requirements – Timings and Format

- (a) Load and generation data must be adjusted to the GXP-based data by adding the appropriate Distributor network loss factor. Time of use data should be the same as the data which is provided to the electricity market for reconciliation purposes.
- (b) The half hourly kWh and kVAh or kVAh data from the Retailer or the Data Administrator must be provided to the Distributor in a CSV file similar to the present data format used for reconciliation purposes under the Code.
- (c) The files received from the Retailer and Data Administrator must contain either kVAh or kVArh data. The system will accept kVArh data and will convert it into kVAh during processing.
- (d) File names must have a format xxxxMMYY.MNN. where xxxx is the data supplier, MMY is the month and year, M is the unique file type identifier and NN is a sequential number for each month starting at 01.
- (e) Files are adjusted for daylight savings time i.e., 46 time periods in October and 50 time periods in March.

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9.0 General

Whilst Fees may be charged as per [Schedule 6.5](#) of the Electricity Industry Participation Code 2010 Counties Power does not charge a processing fee although this may be changed at any time.

Additional Resources are available in Electricity Authority publications

- [Electricity Authority regulated terms](#)
- [Small-scale distributed generation - Fact sheet 7](#)
- [The Electricity Industry Act 2010](#)


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Appendix A: DG1 Form (refer website for latest form)

DG1
FORM

UP TO 10 kW SOLAR, OR OTHER DISTRIBUTED
GENERATION TYPE NETWORK APPROVAL
APPLICATION FORM



COUNTIES POWER

Counties Power Limited | 14 Glasgow Road, Pukekohe, Auckland 2120
Private Bag 4, Pukekohe 2340, New Zealand | www.countiespower.com

On completion of this form, please return to Counties Power Ltd by post or to distributedgeneration@countiespower.com

Please complete this application if you are planning to install a solar, or other distributed generation device up to 10 kW on the Counties Power network.

1. APPLICATION TYPE

New connection - In addition to this form, you also need to complete the New Connections application form

Upgrade to an Existing connection - **If this application is for an existing connection, please enter your unique ICP number below:**

ICP NUMBER

--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

2. SITE DETAILS *This refers to the site where the distributed generation is to be installed*

Site address _____

City _____ Postcode _____

DPS _____ Lot No _____

Other identifying remarks _____

Please state what this site will be used for

Dwelling Commercial Industrial Pump Other _____

3. DISTRIBUTED GENERATOR DETAILS *This is the party who owns and is responsible for the distributed generation installation*

Full Legal Name _____

Contact Name _____

Email address _____ Contact phone _____

Physical address _____

City _____ Postcode _____

Postal address _____

City _____ Postcode _____

Individual / Couple Company Other legal entity - specify _____

4. DISTRIBUTED GENERATION SYSTEM INSTALLER

Full Legal Name _____

Company _____ Contact Name _____

Email address _____ Contact phone _____

Physical address _____

City _____ Postcode _____

Postal address _____

City _____ Postcode _____

5. DISTRIBUTED GENERATION TYPE

Solar Gas turbine Steam turbine Fuel cell Wind turbine Micro hydro

Other, please specify _____

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**DG1
FORM**

UP TO 10 kW SOLAR, OR OTHER DISTRIBUTED
GENERATION TYPE NETWORK APPROVAL
APPLICATION FORM



Counties Power Limited | 14 Glasgow Road, Pukekohe, Auckland 2120
Private Bag 4, Pukekohe 2340, New Zealand | www.countiespower.com

6. INVERTER SPECIFICATION

Manufacturer / supplier _____

Model Number _____ Rated capacity (kW) _____

AS4777 compliant? Yes No

Is the inverter pre-approved? Yes No If no, documented evidence of inverters type test / approval to AS4777 and adherence to Counties Power connection and operating standards, including electrical protection*, must be submitted with this application. *Includes protection to stop network reclosing causing equipment damage, and, the safeguarding of generation feeding back into the network on loss of supply.

7. OTHER DETAILS Specify any other information or special terms that are or may be relevant to this application

8. DISTRIBUTED GENERATION DECLARATION

As the legal owner and distributed generator, we hereby request to connect a distributed generator device up to 10kW to Counties Power Limited's electricity network.

We confirm that the information submitted within this application is accurate and correct.

We hereby agree to comply with all requirements of a distributed generator as required under Part 6 of the Electricity Industry Participation Code 2010.

We confirm that we will inform Counties Power of any future changes to the distributed generation installation.

We confirm that we will comply with all safety requirements as required by a distributed generator.

We confirm that we are aware of our responsibility to arrange for the installation to be tested and inspected, prior to connection.

We hereby accept all charges in relation to processing this distributed generation application form.

This document must be signed by the party that seeks to become the distributed generator. Third parties are not permitted to sign this document on behalf.

Distributed generator name _____

Distributed generator signature _____ Date _____

COUNTIES POWER OFFICE USE ONLY

SO No _____ GXP _____

ICP _____ Pillar/Pole _____

TX _____ Tech assessment _____

Date Received _____

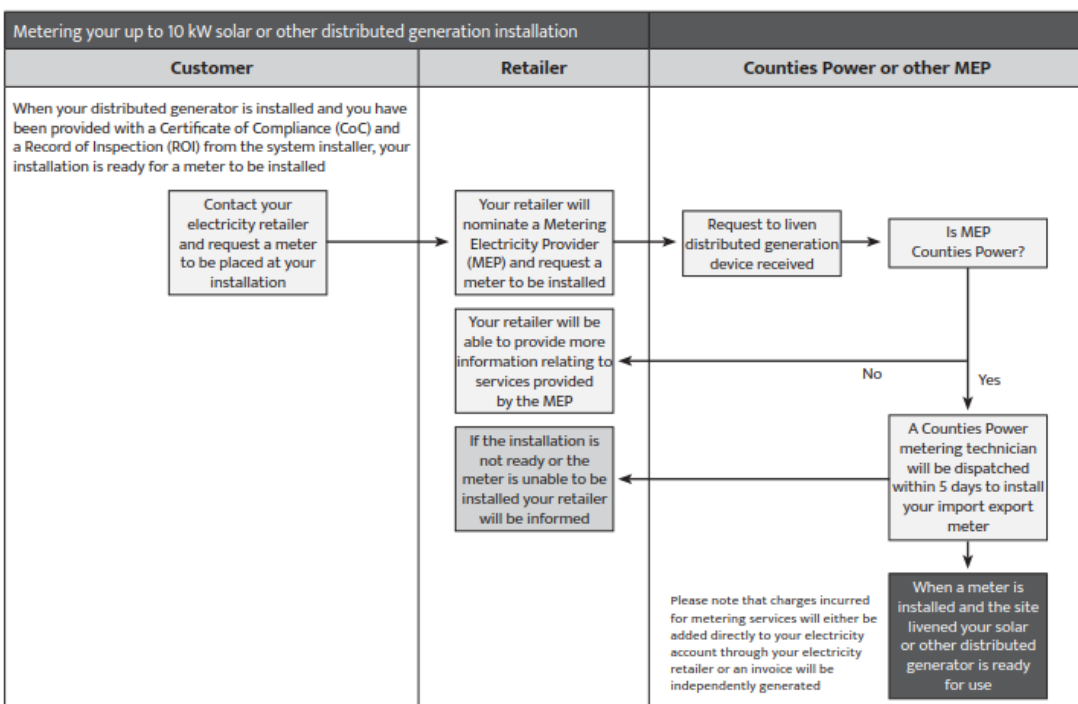
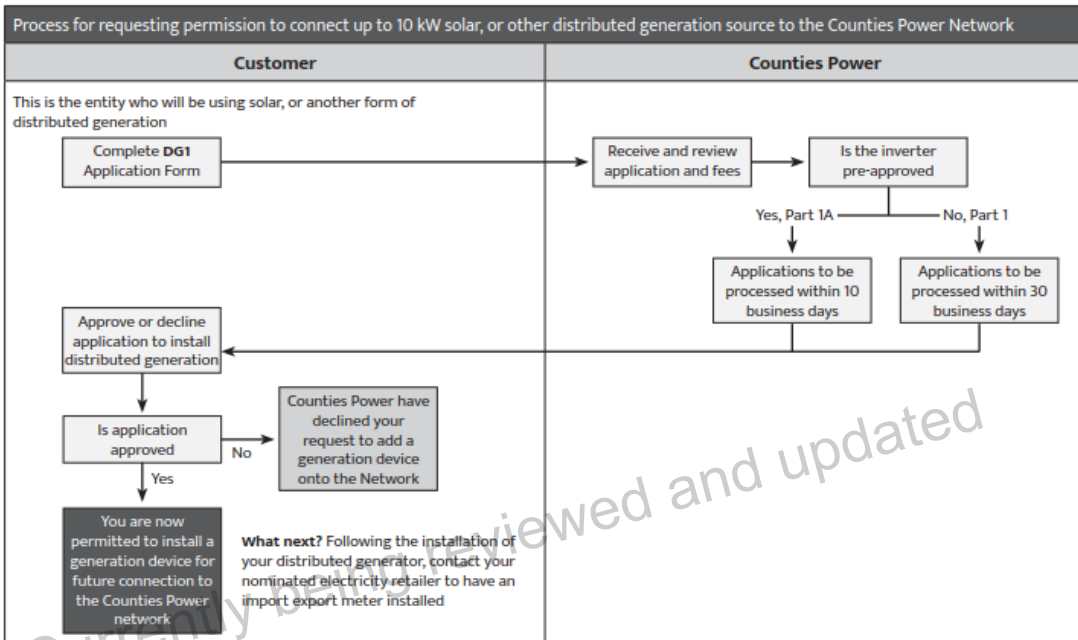
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DG1 FORM

ADDITIONAL INFORMATION FOR UP TO 10 kW SOLAR, OR OTHER DISTRIBUTED GENERATION TYPE NETWORK APPLICATION



Counties Power Limited | 14 Glasgow Road, Pukekohe, Auckland 2120
Private Bag 4, Pukekohe 2340, New Zealand | www.countiespower.com



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**DG2
FORM**

OVER 10 kW SOLAR, OR OTHER DISTRIBUTED
GENERATION TYPE NETWORK APPROVAL
APPLICATION FORM

6. INVERTER SPECIFICATION

Manufacturer / supplier _____

Model Number _____ Rated capacity (kW) _____

If inverter used, is it AS4777 compliant? Yes No

TECHNICAL INFORMATION FOR DISTRIBUTED GENERATION

Data required for each distributed generation system

Data required for range of power output	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)	✓	✓	NA
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 power output	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	✓	✓	✓

Interface arrangements

Data required for range of power output	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/kVAr 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:			

Distribution Code – Part 4: Distributed Generation Requirements

**DG2
FORM**

OVER 10 kW SOLAR, OR OTHER DISTRIBUTED
GENERATION TYPE NETWORK APPROVAL
APPLICATION FORM

Interface arrangements

Data required for range of power output	10-100 kVA	100-750 kVA	> 750 kVA
(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)		✓	✓

Distribution Code – Part 4: Distributed Generation Requirements

**DG2
FORM**

**OVER 10 kW SOLAR, OR OTHER DISTRIBUTED
GENERATION TYPE NETWORK APPROVAL
APPLICATION FORM**

Protection Requirements	10-100 kVA	100-750 kVA	> 750 kVA
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	✓	✓	✓
Power factor or voltage regulation equipment		✓	✓

7. OTHER DETAILS Specify any other information or special terms that are or may be relevant to this application

8. DISTRIBUTED GENERATION DECLARATION

As the legal owner and distributed generator, we hereby request to connect a distributed generator device over 10kW to Counties Power Limited's electricity network.

We confirm that the information submitted within this application is accurate and correct.

We hereby agree to comply with all requirements of a distributed generator as required under Part 6 of the Electricity Industry Participation Code 2010.

We confirm that we will inform Counties Power of any future changes to the distributed generation installation. We confirm that we will comply with all safety requirements as required by a distributed generator.

We confirm that we are aware of our responsibility to arrange for the installation to be tested and inspected, prior to connection.

We hereby accept all charges in relation to processing this distributed generation application form.

This document must be signed by the party that seeks to become the distributed generator. Third parties are not permitted to sign this document on behalf.

Distributed generator name _____

Distributed generator signature _____ Date _____

COUNTIES POWER OFFICE USE ONLY

SO No _____ GXP _____

ICP _____ Pillar/Pole _____

TX _____ Tech assessment _____

Date Received _____

Distribution Code – Part 4: Distributed Generation Requirements

Appendix C: Approved Inverters

Counties Power accepts the approved inverters listed by the Clean Energy Council on their website at:

<http://www.solaraccreditation.com.au/products/inverters/approved-inverters.html#searchResults>

Currently being reviewed and updated

Distribution Code – Part 4: Distributed Generation Requirements

Appendix D: Electricity Retailers

The following Retailers currently supply electricity across our Network:

- Contact Energy
- Ecosmart
- Ecotricity
- Electric Kiwi
- Energy Club
- Energy Online
- Flick Electric
- Genesis Energy
- GLOBUG
- Mega Energy
- Mercury Energy
- Meridian Energy
- Nova Energy
- Pioneer Energy
- Powershop
- Prime Energy
- Pulse Energy
- Simply Energy
- Supercharged Energy
- Switch Utilities
- Trustpower

List as at March 2019

Distribution Code – Part 4: Distributed Generation Requirements

Appendix E: Electricity Industry Participation Code Requirements for Generating Units over 1MW

In addition to supplying Counties Power with details of embedded generating plant, there is a requirement to provide information to Transpower as “system operator” under The Code where a connection exists, or is proposed, to the electricity system. The governing system performance and the technical characteristics of any existing or proposed generating unit over 1 MW are required by Transpower and apply to all generating units whether directly connected to the Transpower grid or connected via the Counties Power distribution system.

It is the responsibility of the generator or prospective generator to provide the information directly to Transpower as system operator. A copy of all information passed directly to Transpower is to be provided to Counties Power so that all requirements can be coordinated.

Information on generating units connected directly to the Transpower system is not required to be provided to Counties Power.

Generation with a capacity of greater than 10 MW may be subject to central dispatch by the system operator. Generation with a capacity greater than 30MW is required by the code to be under central dispatch.

For generation not subject to central dispatch the operation arrangements will be as set out in the connection agreement with Counties Power.