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LV Service Connection Guide

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1 Introduction

1.1 Purpose

This document outlines Top Energy's core processes and technical requirements for low voltage service connections to Top Energy's network. This includes:

- the creation of new connections and installation control points (ICPs);
- livening of connections;
- changes to existing connections, and;
- the connection of small to medium scale distributed generation (DG).

1.2 Scope

The scope of this Standard relates to all low voltage service connection. This document is supported by specific technical standards, requirements and process guides as relevant.

1.3 Application

This Standard shall be applied to all new LV service connections on Top Energy's network.

This audience of this document is both external and internal users – some content relates to process guidance/commentary for internal users (Top Energy).

2 References

Internal Reference	Details
Processes / Template (in this document)	
Connection Application & Network Assessment Process	TBC
Electricity Network Connection Standard	Customer guide for the technical requirements for new service connections.
(CM05-01-018S) - Connection of new Low Voltage Service Mains.	This work instruction defines the requirements, responsibilities, and processes for the installation, inspection, testing, connection, and energisation of new Low Voltage (LV) Service mains connected to the Top Energy Network.
Policies / Standards	
Customer Initiated Works (CIW) Standard	TBC
(CM02-01-004S) - ELAM and BELAM Assessment Guide	This guide explains how Top Energy assesses export capacity for distributed generation applications, what information is considered, when a more detailed assessment is needed, and what customers can expect to receive at the end of the process.

Underground Distribution Network Design Standard	This standard defines Top Energy's requirements for the design and configuration of underground distribution network and associated ground mounted equipment for voltages up to and including 11kV.
Overhead Line Design Standard	This standard provides Top Energy's requirements for overhead line design on Top Energy's Distribution and Sub Transmission Network.
Generation Congestion Management Policy	This Policy supports the Top Energy Generation Policy and provides for all generators connecting to the Top Energy Network to comply with Top Energy operating requirements.
Disconnection or Isolation of Service Mains (Low Voltage)	This document ensures safe and efficient action of Isolation and Disconnection Service requests. It ensures effective communication and notifications are carried out the delivery of customer services and safety responses.
Reconnection or Restoration of Service Mains	This document outlines Top Energy's process and requirements for the reconnection or restoration of service mains.
Guide for Assessing Electricity Lines Ownership	This document provides Top Energy guidelines for establishing the ownership of electric lines whenever electricity lines are to be constructed, upgraded, or maintained.
Technical Standards	
Distributed Generation – DG less than 10kW	This document details Top Energy's technical requirements for the connection of small-scale DG.
Distributed Generation – DG 10kW – 1000kW	This document details Top Energy's technical requirements for the connection of medium scale Distributed Generation (10kW – 1000kW) systems using inverters to connect to Top Energy's low voltage electricity distribution network.
Electricity As-Built Reporting Standard	Top Energy requires new construction, corrective and reactive maintenance activities that impact the Top Energy Network to be provided to an approved As-Built standard. This document details the Network's requirements for all As-Built documentation, including As-Built plans, data capture forms, test records, and photographs.

External Reference	Details
AS/NZS 3000:2007	Electrical Installations (Australian/New Zealand wiring rules)
NZECP34:2001	Electrical Safe Distances
AS/NZS 4777:2020	Grid Connection of Energy Systems via Inverters
NZ Government / ESR	Electricity (Safety) Regulations
Australian Clean Energy Council	http://www.solaraccreditation.com.au/products/inverters.html

EIPC Code	Electricity Industry Participation Code 2010 (The Code). *Note – Part 1 (Defined Terms); Part 6 (Distributed Generation); Part 10 (Metering); Part 11 (Registry and ICP Management).*
Use of Systems Agreements (UoSA)	Use of System Agreements with electricity retailers (also known as the DDA – Default Distributor Agreement).
EA DG Connection Guidelines	The Electricity Authority "Connection of small-scale distributed generation (equal to or less than 10 kW) to a local network", 2014.
EA Guidelines	Connection and Electrical Connection Guidelines (June 2018). Guidelines on Unmetered Load Management (Version 2.1). Guidelines for Metering, Reconciliation, and Registry. Arrangements for Secondary Networks (Version 8.2 Draft).

3 Definitions

Terminology	Definition
Customer Initiated Works (CIW)	Top Energy's process for managing customer requests that require upgrades or alterations to the network, and the associated cost allocation / contributions to the relevant customer(s).
Customer	The party (or their agent) who will be supplied by, or is requesting, the Connection to the Top Energy network.
Customer Management System	The system(s) used by the Customer Service Team to manage and coordinate customer services, including where relevant: connections requests, contractor works orders, customer correspondence and complaints.
Customer Services Team	The Customer Services Team within Top Energy (Network).
Customer Services Coordinator	The role(s) responsible within Top Energy for the coordination of connections and approvals.
ICP	Installation Control Point. A point of connection at which the electrical installation for a retailer's customer is connected to the Top Energy network.
ICP Identifier	The unique identifier for an ICP created by Top Energy in accordance with the Code.
Network Approval	Approval from Top Energy for a customer to connect or change an existing connection.
Top Energy (Network)	The network distribution business that owns, operates and maintains the electricity distribution network assets.
Top Energy Contracting	The contracting division of Top Energy Ltd, who are the primary Approved Service Provider to Top Energy (Network) for electricity network maintenance and reactive services.

Terminology	Definition
Approved Service Providers ("ASP's")	Contractors employed directly by Top Energy Network to complete network related "works".
Network Approved Contractor	Contractors that have been pre-approved by Top Energy to undertake specified works on, or in close proximity to, the Top Energy network. These are generally engaged directly by non-Top Energy parties (i.e., Retailer, Customer etc.).
Livening Agent	A Network Approved Contractor, who is specifically authorised to liven connections to the network.
Metering Installer	The Contractor engaged by the Retailer to install metering equipment on a customer premise.
Retailer	The electricity retailer who the Customer purchases electricity from, and who has a contractual relationship with Top Energy under a Use of System Agreement.
(The) Registry	The database maintained by the Electricity Authority to record information about ICPs.
Service Connection (Point of Connection)	The point at which electricity may flow into or out of the Top Energy low voltage (LV) network to/from an ICP.

4 Overview

1 Top Energy's Connection of Low Voltage service mains(M05-01-018S) and Electricity Network Connection Standard requires all service connections to meet safety and technical requirements before connection to the distribution network is allowed.

Key policy aspects include:

- Connection Applications must be made for all new (or amended) service connections and distributed generation connections.
- Network Approval must be provided by Top Energy, prior to connection of new (or amended) connections.
- All connections (including Distributed Generation) must meet the technical requirements specified by Top Energy.
- Where connections require works to amend or upgrade the distribution network to enable the connection to proceed, Top Energy's *Customer Initiated Works Standard* applies. As part of this, the Customer may be required to pay for some (or all) of the associated works, and Top Energy may contribute to the cost of the works.
- Where existing service connections need to be amended or altered, current legislative and Top Energy requirements need to be applied (i.e., treat as a new connection).
- Electrical connections to the Top Energy network are only allowed to be undertaken by Approved Service Providers or Network Approved Contractors (where they have been specifically authorised to undertake these works).

Further detail on these aspects is provided in the relevant sections in this standard.

Long Term Disconnected Service Connections

Where a 'long term disconnected service' (greater than 6 months) is intended to be reconnected to the Top Energy network, and the span previously connecting the service to the network has been removed, Top Energy will arrange replacement of the removed span and allow the reconnection i.e., as it was before it was disconnected. Subject to provision of an electrical safety certificate (ESC), a Certificate of Verification (CoV) and/or were prescribed electrical works has taken place will then require a Certificate of Compliance (COC) for the installation. For high risk work a Record of Inspection (ROI) would be required.

5 Applications for Connections

An Application for a Connection is required for all new connections and changes to existing connections on the Top Energy network. Network approval must be obtained before the connection or change can proceed.

Applications may be submitted by the customer or by a contractor or agent acting on their behalf. All required information must be provided to enable Top Energy to assess the application and avoid unnecessary delays.

5.1 Submitting Applications

Applications for new or amended connections are to be submitted by completing the online form on Top Energy's website: https://topenergy.co.nz/i-want-to/get-connected.

5.2 Queries

Any questions or queries should be directed to the Customer Services Team to coordinate and manage in Top Energy's customer management system.

Contact can be made via:

- email to: connect@topenergy.co.nz;
- or by calling: TOP ENERGY (0800 867 363)

5.3 Connection Process, Requirements & Guides

Top Energy provides additional guidance for customers about the connection process and technical requirements on Top Energy's website.

The high-level process for a new Connection is outlined in ***Appendix 1 - New Service Connections Process.***

6 Network Approval Requirements

6.1 Network Approval

Network Approval is required for all new connections and changes to connections made to the Top Energy network.

Network Approval is required for the following situations:

- Connection of a new Installation Control Point (ICP).
- Connection that has been previously decommissioned (treated as a new ICP).
- Connection of an unmetered supply (excluding public street-lighting owned by the relevant roading authority or the District Councils).
- Increase in load from that originally approved or designed.
- Change in phasing from that originally approved or designed.
- Separation of an existing supply for an additional supply or tenancy.
- Connection of a distributed generation system.

Network Approval is intended to ensure the following:

- Electricity supply connection (fusing) is available.
- The correct connection point is utilised.
- The correct phasing is utilised.
- Network capacity is sufficient.
- Network voltage range is maintained within defined limits (i.e., volt drop/rise).
- Legal access to the network.

Any issues or discrepancies between the Connection application submitted to Top Energy and the allocated supply, concerning the connection point, phasing, capacity, and legalities are to be followed up by Top Energy with the customer or their electrician. If the issue cannot be resolved, then Network Approval for the connection cannot be provided.

6.2 Network Approval Not Required

Network Approval is not required for the following situations:

- Disconnection or decommissioning of ICP's.
- Reconnection of ICP's that have been disconnected or de-energised other than long-term disconnected ICPs.
- Relocation of an existing meter station within same property.
- Combining / centralisation of existing ICP's within same property
- Changing a Builders Temporary Supply (BTS) to a caravan supply.
- Addition of a sub-main or other change beyond the meter station, provided the loading remains within original designed capacity.
- Streetlights and traffic lights installed by Network Approved Contractors for authorised third parties (e.g., District Councils or Roading Authorities).

6.3 Top Energy delegation of 'Network Approval' to Approved Service Provider(s)

Top Energy may delegate 'Network Approval' ability to pre-defined Approved Service Provider(s) where they are approved as capable of reviewing design considerations and connections on behalf of Top Energy.

6.4 Network Approval - Validity period

The Network Approval is valid for up to **6 months** after issue. If the installation has not been connected and livened within this time, a new application should be submitted.

7 Technical Requirements – New LV Service Connections

7.1 Introduction

Top Energy's technical requirements for service connections are overviewed within this Standard. Specific technical requirements are detailed further in the referenced Top Energy Technical Requirement documents, standards or policies. This includes (but is not limited to):

- Customer Initiated Works Standard.
- Electricity Underground Design Standard.
- Overhead Line Design Standard.
- Congestion Management Policy – Distributed Generation.
- Disconnection or Isolation of Service Mains (Low Voltage).
- Reconnection or Restoration of Service Mains.
- Electricity As-Built Reporting Standard.
- Technical Requirements – Distributed Generation – DG less than 10kW.
- Technical Requirements – Distributed Generation – DG 10kW – 1000kW.

7.2 Existing LV Service Connections

Existing service connections should have been commissioned to the standard required at the time of connection. Where existing service connections now need to be amended or altered, the current government legislation and Top Energy network requirements need to be applied.

7.3 New LV Service Connections – Standard Requirements/Options

Top Energy's core technical requirements for low voltage service connections are outlined below, with further detail provided primarily in:

- Electricity Underground Design Standard.
- Overhead Line Design Standard.

7.3.1 Supply from Overhead Service (Pole fuse)

If the new connection is to be supplied from an overhead connection, i.e., a pole mounted fuse holder:

- Overhead Line Design Standard.

7.3.2 Supply from Pillars or Pits / TUDS

The current standard pillars in use are the Transnet Ecopillar system – primarily the EP3, EP4 and EP6.

If the new connection is to be supplied from a Transnet Total Underground Distribution System (TUDS) the service cable is required to be a double insulated, non-screen cable, between 6mm² and 50mm², manufactured in accordance with AS4026.

- Electricity Underground Design Standard.

7.3.3 Fusing sizes

Top Energy's standard service connection fuse size for a domestic supply is 60A.

Installations connected to transformers of 30kVA or less, will generally require to be fused at less than 60/63A.

If requested by the customer or electrician, lower rated fuses may be installed provided that standard fuses stocked by Top Energy are utilised and the rating is marked on the fuse holder.

The use of whole current metering is limited to a maximum of 100-amp supply per phase; supply requirements of greater than 100 amps per phase will require CT metering.

7.3.4 Load Control Requirements

All new installations with suitable interruptible loads shall be capable of being controlled by Top Energy's load control system through an approved Top Energy owned and supplied ripple receiver or relay.

7.4 Builder's Temporary Supplies (BTS)

A Builder's Temporary Supplies ("BTS") shall:

- Only be utilised for providing an electricity supply for building or construction work.
- Not be utilised for providing an electricity supply for residential, leisure or commercial use.

Builder's temporary supplies may only be used for up to a 2-year period. A short extension may be granted if the completion of building work is imminent. Otherwise, the builder's temporary supply shall be changed to an appropriate permanent supply, disconnected, or decommissioned.

All Builder's Temporary Supplies must be metered and can be either:

- 1 phase (30A) for housing or small commercial construction.

- 3 phase (60A) for large commercial or industrial construction.

A customer requiring a Builder's Temporary Supply will need to complete and submit to Top Energy, a standard "Application for Network Connection or Alteration to Supply".

A Top Energy Installation Control Point (ICP) number is to be allocated to each BTS. This number should be retained when it is changed to a permanent supply.

7.5 Unmetered Supplies

7.5.1 Unmetered Supplies – General

An unmetered load is defined as electricity consumed that is not directly recorded using a meter but is calculated.

Unmetered electricity supplies can be utilised where the load is low, the load can be defined by the wattage and time period, and provision of a metered supply is not practical. If the load is uncertain, then a metered supply should be provided.

The quantity of electricity (in kWh) consumed by an unmetered load over a particular time period is calculated by multiplying the load in kW by the length of time the load is consuming electricity (in hours). The quantity of electricity consumed by each point of connection is to be determined and allocated as accurately as possible.

Under the Electricity Industry Participation Code 2010 (Part 10) the quantity of electricity used by an unmetered supply with a single point of connection to Top Energy's network must not exceed 3,000 kWh per annum. Therefore, the actual load connected as unmetered load will depend on the annual operating hours for the load; continuously operating load should not exceed 342 watts while load operating for 8 hours per day should not exceed 1kW.
There are two exceptions to this general 3,000 kWh Code limitation:

- Public or private streetlighting (termed "distributed unmetered load" which has no kWh limit but is subject to several other Code requirements.
- Predictable load of a type approved and published by the Electricity Authority has a limit of 6,000 kWh per annum.

Unmetered load at an ICP can be either uncontrolled (24 hour) or controlled load but not both and unmetered load may be the only load at an ICP (wholly unmetered ICP), or it may coexist with a metered load.

A standard Application for Network Connection form is to be completed for each new unmetered connection. The details of the unmetered load (type of load, size of the load in watts, and expected operating hours per day) must be entered on the Application form.

The Applicant's designated "designer" is responsible for advising the customer of the requirements and for calculating or checking the expected annual kWh usage. New unmetered connections, or conversion or existing connections to unmetered, must be approved by the Network Compliance Manager. The details of the unmetered load usage calculation must also be entered on the Application for Network Connection form.

If approved by Top Energy, an electricity retailer must accept responsibility for all new unmetered load, whether it requires a new ICP or is additional load on an existing ICP before it can be connected. Note that an electricity retailer is not obligated to accept an unmetered supply ICP or an ICP with combined metered and unmetered load.

One person, company or a specific body (e.g., a body corporate) must take responsibility for the electricity consumption at an unmetered ICP. The charges for unmetered load cannot be split between several ICPs (termed Shared Unmetered Load). Note: Existing Shared Unmetered Load ICPs are effectively “grandfathered”.

The line charges for an ICP with a wholly unmetered load will be those specified on Top Energy’s website. However, where the unmetered load is part of a metered ICP the line charges for the unmetered portion of the load will use the peak or uncontrolled price.

7.5.2 Unmetered Supplies – 24 Hour

Unmetered load that operates on a regular basis for up to 24 hours per day but excludes public lighting. This type of unmetered load includes security cameras, electronic signs, and public telephones or older copper-based telco cabinets.

Load that would not qualify as unmetered would be:

- Speed cameras.
- Electric security/private subdivision gates.

The above have variable load which cannot be quantified due to the operating time being dependent of outside factors such as number of gate activations, number of vehicles exceeding the set speed parameter, etc.

Each installation is to have an ICP number assigned to each supply point from the main electricity reticulation.

7.5.3 Unmetered Supplies – Under Veranda Lighting

Under veranda lighting connections include shop signage and security lighting attached to business premises.

No new unmetered under veranda lighting is permitted to be connected.

Existing unmetered under-veranda lighting connections may be retained, however when any alterations are undertaken to the lighting or switchboard at the premise the existing unmetered under-veranda lighting connections must be connected through a metered supply.

Existing under veranda lighting must be controlled by a suitable device supplied and maintained by the customer such as a time switch.

It is the customer’s responsibility to prove that existing under-veranda lighting is no longer unmetered load (i.e., has now been connected through a meter) or is no longer connected.

7.5.4 Unmetered Supplies - Streetlights and Public Amenity Lighting

Street lighting includes public and private streetlights, security lighting and public toilet lights which are controlled from dawn to dusk.

If a ripple-relay is being used to control the lighting it must be on the appropriate "dusk to dawn" street lighting channel. The total load on the circuit should be within the ratings of the contacts on the ripple-relay.

In all cases the retailer is responsible for supplying the number of lamp fixtures and the kWh quantity of energy consumed by those fixtures for line charge billing purposes.

For “distributed unmetered load” the Code makes the retailer responsible for ensuring a database is maintained of each customer’s lamp.

Private Streetlighting

Private street lighting is generally installed along private roads and access ways (this lighting is not vested to the District Council). All private street lighting is to have a separate ICP number assigned for each customer and an electricity retailer MUST have accepted an ICP for private street lighting before it is connected.

Connection of private streetlighting requires an Application for Connection and Network Approval. The installation and connection of the streetlights to Top Energy's Network must only be undertaken by Network Approved Contractors engaged by the streetlight owner.

Public street lighting

Is generally managed as "distributed unmetered load" as detailed in the Code and Electricity.
Authority document "Guidelines on Unmetered Load Management". The total load represented by an ICP may exceed 3,000 kWh per annum and there is one ICP assigned per customer per GXP (Grid Exit Point).

Any additional unmetered connections to the streetlight network under the relevant unmetered streetlight ICP will not require a service request from the Retailer as no metering is required.

Councils can engage Network Approved Contractors to install fuses and connect streetlights and traffic lights to the Top Energy network. These Network Approved Contractors (where authorised to act on behalf of Council) are required to inform Top Energy and provide *As Built Plans*, including power rating and intended consumption, for all new connections and changes to existing connections.

7.6 Asset Ownership & Demarcation

Refer to Top Energy:

- Guide for Assessing Electricity Lines Ownership

8 Connection and livening to Top Energy's Network

8.1 Connection Process

The high-level process for a new LV Service Connection is outlined in ***Appendix 1 - New Service Connections Process.***

8.2 Laying Service Cables

Where the underground service cable is installed by a non-Top Energy Approved Contractor, the service cable must only be installed to the base of the pillar or the web of the pole, refer to:

- NZECP34:2001 Electrical Safe Distances.

For guidance around restrictions working near network structures.

8.3 Connecting Services to the Network Fuse holder

Only Contractors specifically approved by Top Energy can connect the service cable (or line) to any Top Energy asset – including installing the cable into the existing pit/pillar or up the pole to the crossarm.

These Contractors can then connect the service main to the fuse holder, but they must not liven the connection (insert fuse) unless they are approved as Livening Agents (below).

Prior to connection of the service main to the fuse holder, the Contractor must confirm with Top Energy Network that the Retailer has requested connection and accepts responsibility for the ICP *(as per Clause 31(2)* Electricity Industry Participation Code 2010 *Part 10).*

8.4 Livening of connections only by approved Livening Agent

Livening of a connection is only allowed to be undertaken by a Livening Agent (who has Network Approved Contractor status for livening connections), who is to ensure that the new connection complies with the following before it is livened:

- Current NZ electrical safety regulations, standards, and codes of practice.
- Top Energy's Electricity Network Standards, Policies, and requirements.
- Top Energy's Network Approval document.

A Certificate of Compliance (CoC) has been provided for all parts of the service and installation to be connected and includes details of works completed.

The meter station and meters have been clearly labelled by the metering installer, including the following:

1. Top Energy's premise no.
2. Certification with full ICP no.
3. 24 hour and Controlled meters.
4. Import and Export meters.
5. Property details where there are multiple ICP's in the meter station e.g., Flat 1.

The meter installation and installed metering complies with the appropriate metering technical specifications available on the Top Energy website.

If Distributed Generation has been installed as part of this connection, there are strict requirements that must be met before the Distributed Generation can be connected and livened.

Refer to the section on Distributed Generation later in this Standard and refer to *Technical Requirements – Distributed Generation – DG less than 10KW & Distributed Generation – DG 10kW – 1000kW.*

8.5 Information Livening Agent must submit to Top Energy

Upon livening a new connection to the Top Energy network, the Livening Agent must submit the following information (as updated from time to time) to Top Energy to meet requirements of the Code. The information required is to be provided in a format specified by Top Energy.

Note – This is separate to the requirements of the Retailer or Metering Equipment Provider, which also have information requirements in accordance with the Code.

Site Details:

- ICP Identifier.
- Street Address.

- Rapid Number (if available).
- Connection Livening Date.
- GPS Coordinates (NZTM Format).
- Retailer.
- Top Energy Reference (if relevant, i.e., service request/work order).

Connection Details:

- Number of phases connected (1,2 or 3).
- Phase colours utilised (Blue, Red, White).
- Network Fuse ratings (Amps).
- Overhead or Underground Connection.
- Connection Point (i.e., Network Fuse Location at: Pole, Pillar, Pit, Distribution Board).
- Network Connection Fuse Location (if different to Network Fuse location).
- Customer Service Cable Size.
- Tariff Types (Controlled/Uncontrolled/Unmetered).

Controlled Load Details (if applicable):

- Type of Controlled Load.
- Control Channels – available.
- Control Channels – in use.

Unmetered Load (if applicable):

- Type and size (Watts).
- Time(s) that the unmetered load is operational.

Inspector & Certification Details:

- Company Name.
- Inspector Name.
- Inspector License Number / ID.
- Test Results (e.g., earth loop impedance test reading).
- CoC Certificate Number.
- ESC Number.
- ROI Number.
- ICP Status on leaving site (i.e., connected, disconnected).

9 Connection of Small to Medium Scale Distributed Generation

9.1 Introduction

Top Energy's process and technical requirements for the connection of Distributed Generation ("DG") are overviewed within this Standard, with specific detail and technical requirements defined in the relevant Top Energy Technical Requirement documents, standards, or policies.

9.2 Applications for the connection of Distributed Generation

Customers are required to apply to Top Energy for the pre-approval of connecting distributed generation prior to connecting to the Network.

Applications for Distributed Generation connections are to be submitted online at Top Energy's website: https://topenergy.co.nz/i-want-to/get-connected/distributed-generation-solar.

Queries can be made via:

- email to: distributedgeneration@topenergy.co.nz;
- or by calling: TOP ENERGY (0800 867 363).

Applications are to be made by the customer (or their installer/electrician) and need to provide all information required by Top Energy to enable the application to be processed.

9.2.1 Application & Connection Process – Overview

A high-level outline of Top Energy's process for managing DG Applications and Connections is as follows:

- Customer develops a design to determine the electrical generating capacity and electrical system specification.
- Customer submits a Distributed Generation Application to Top Energy.
- Top Energy will check that the network is capable of hosting the proposed generation and for any potential "quality of supply" issues. Top Energy will advise if any enhancements (including additional work) to the network are required.
- Top Energy can provide an approval for the installation of distributed generation once any technical issues are resolved. Note the approval will contain any relevant technical conditions including maximum generated power, phasing and if Top Energy requires a site visit and verification prior to livening.
- The owner of the distributed generation equipment will need to organise with their Retailer to arrange purchase of any excess power generated.
- The Retailer will organise for the installation of the import/export metering once an ICP has been issued. The Retailer will require a copy of Top Energy's approval to confirm that the proposed generation system is able to be connected.
- Customer to install the generation system and make ready to connect. Note that the installer or Electrical Inspector may make a brief temporary connection to run the generation system for testing (only) purposes.
- Top Energy will coordinate with the customer (or their installer) to connect the distributed generation to the network – this may require an inspection and verification of compliance by Top Energy.

Note -

- that the approval for the distributed generation installation is valid for 6 months. If the generation equipment has not been connected within this timeframe, a new application will be required.
- NZ EWRB Inspector is required to be ticketed for 'Mains Parallel Generation' endorsement.

9.3 Distributed Generation – Technical Requirements

For full technical details refer to Technical Requirements:

- *Distributed Generation – DG less than 10kW*
- *Distributed Generation – DG 10kW – 1000kW*

9.3.1 Distributed Generation Connection – Technical Requirements

9.3.1.1. Inverter Compliance

The inverter connecting a DC generation system is to comply with the version of AS/NZS 4777, Grid Connection of Energy Systems via Inverters that are specified in the current Electricity (Safety) Regulations.

A list of inverters compliant with AS/NZS 4777.2:2020 is available on the Australian Clean Energy Council website. https://www.cleanenergycouncil.org.au/.

9.3.2 Network Impact / Capability to Connect DG:

9.3.3 Phasing

The phasing of the distributed generation is to be compatible with the supply transformer and with *Technical Requirements - Connection of* Small *to Medium Scale Distributed Generation Standard.*

9.3.4 Transformer Capacity

The generation capacity of all the systems connected to each phase of the transformer is not to exceed the rated capacity.

9.3.5 Voltage Drop

The network voltage drop should be checked when the generation to be connected is either a long way from the transformer (>200m) or the distribution conductors are small (<35mm² Cu or < 70mm² Al).

If the voltage drop of the existing distribution reticulation exceeds the required voltage limits at the point of supply, then this will require Top Energy to amend the network.

The voltage drop should also be checked if there is a request to change the network connection from a multi-phase supply to a single-phase supply.

9.3.6 Voltage Rise

The voltage rise is to be checked when the generation capacity connected to an individual low voltage distribution feeder exceeds 5 kVA per phase.

If the voltage rise limits are exceeded at the point of supply, the application will be declined unless this is remedied at the customer's cost. Approval may be provided for either a reduced generation capacity or a restriction on exported power.

The voltage rise should also be checked if there appear to be network voltage drop issues.

9.4 Approval of connection of distributed generation

The Network Approval of Distributed Generation Connection Applications is to be completed by the Customer Services Team.

Network Approvals are undertaken to confirm that the generating system complies with Top Energy requirements and will not adversely impact on the electricity network's performance.

Top Energy's specific technical requirements and process are outlined in Top Energy's network standards including:

- New Distributed Generation Connection Process (Appendix 2)
- Distributed Generation – DG less than 10kW
- Distributed Generation – DG 10kW – 1000kW

- ELAM and BELAM Assessment Guide

9.4.1 Approval of Distributed Generation

The approval is to include the following:

- Customer's name and installation address.
- Full ICP number.
- Generation type and approved capacity.
- Battery or storage capacity if applicable.
- If Top Energy requires an inspection and verification prior to livening.

If there is an approved change in the supply phases connected in conjunction with the distributed generation installation this is to be included in the Top Energy approval.

If the approval is subject to a required network upgrade by Top Energy, then details are to be included.

The approval is to be forwarded to the following:

- The applicant (i.e., the Customer or their provider/installer).
- The customers chosen Retailer (if provided).
- Top Energy's relevant teams.

All DG approvals are to follow the ELAM BELAM Assessment Guide.

9.4.2 Approval Validity

The approval is valid for up to **6 months** after issue. If the distributed generation has not been connected and livened within this time, a new application is required to be submitted.

9.4.3 Approval before ICP number created

If the customer does not yet have an electricity supply connection and an ICP number is not available, then an approval may still be issued. However, the approval should initially only be sent to the provider/installer/customer.

Note - an electricity supply connection should be available and subject to a new Connection Application approval process.

The new connection Network Approval should refer to the distributed generation approval and vice versa and both should confirm if the Distributed Generation connection is to be completed in conjunction with the new connection or separately.

Note that the ICP for the Connection will need to be created and issued in the customer's name before the Retailer can organise for installation of import/export metering.

9.4.4 Phase change approval

Domestic Distributed Generation (DG) systems with or without battery storage are generally single-phase installations under the simple ELAM engineering process. They would be approved for and work most efficiently with single-phase connection to the network. Because of this, there might be requests to change existing multiphase installations to single phase in conjunction with the distributed generation installation unless the

customer has approval for a multiphase installation. Phase changes requested to be implemented with the distributed generation connection.

- If satisfactory, the approval of the phase change can be included with the Top Energy approval for the connection of distributed generation.
- If the approval has already been issued it may be updated to include approval of the phase change and reissued.

Phase changes requested to be implemented separately from the connection of the distributed generation.

- A separate application to Top Energy will be required and if satisfactory, a Network approval (for services) can be provided. Additional costs to the customer may apply.

Details will be recorded in Top Energy's connection application system and the distributed generation database.

9.4.5 Expanding export capacity of existing generation

Customers wishing to increase the capacity or export capability of an existing distributed generation system must submit a new Distributed Generation application through topenergy.co.nz.

Top Energy will assess the proposed change against available network capacity, phasing and applicable technical requirements. Any network work or changes to the existing connection identified through the assessment must be addressed before approval.

Following approval and completion, Top Energy will update the relevant connection and generation records.

9.4.6 Reducing capacity of existing generation

Customers must notify Top Energy when the capacity of an existing distributed generation system is reduced. This enables us to update our network records and the generation information held in the Electricity Registry.

Accurate information also helps us understand how much network capacity may be available for other customers wanting to connect generation nearby.

Notify us through the Distributed Generation section of Top Energy's website.

9.4.7 Decommissioning of existing generation

Where a customer has decommissioned their existing distribution generation system, the customer must notify Top Energy. Top Energy needs accurate information to maintain systems and meet industry reporting requirements including removal of generation information held in the Registry for the ICP.

Notifications are to be made by application at: https://topenergy.co.nz/i-want-to/get-connected/distributed-generation-solar.

9.5 Livening & Inspection requirements

Top Energy requires the generating system installation to be inspected by a registered electrical inspector. Where the distributed generation is being installed on an existing ICP, the electrical inspector is not required to be a Network Approved Contractor (i.e., is required for new ICPs only).

Top Energy may also require the distributed generation system be inspected and verified by Top Energy or a Network Approved Contractor to ensure compliance with network standards (i.e., to ensure grid protection or anti islanding device operates, and generator disconnects during fault or outage).

All distributed generation connections are to meet the requirements of:

- Top Energy's Network Approval for the distributed generation, including phasing and capacity.
- Top Energy's technical standards including Technical Requirements – Distributed Generation – DG less than 10kW & Distributed Generation – DG 10kW – 1000kW.
- Certificate of Compliance.
- Electrical Inspection (with a Record of Inspection).
- Operation of the grid protection or anti islanding device.
- Safety labelling is in place.

9.6 Recording Distributed Generation Connections

9.6.1 Capturing Distributed Generation Connections in Top Energy Systems

Once the distributed generation connection has been made, Top Energy systems must be updated to ensure the key details are known and available to the relevant network functions. This includes notifying:

- GIS - *showing the DG Connection by the transformer and by the ICP on the map.*
- *Custo*mer Management System, and the Registry with the ICP details.

9.6.2 ICP Details

Details of the distributed generation system are to be recorded with the ICP information in the Customer Management System, Axos Registry Manager, and Electricity Registry (as relevant).

- *Generation type (Photo Voltaic, Wind, Hydro etc.).*
- *Generation capacity (kVA or MVA – capacity in kW is required for the Registry).*
- *Battery or storage capacity (kWh).*
- *Connection date.*
- *Disconnection date.*

10 Document Review History

Version Number	Date	Revision Notes (reason for change)
1.0	20/11/2026	Released

Appendix 1: New Service Connections Process

1. New Connection request

A customer or their nominated electrician will complete the new connection application form and pay application fee. When the application is received, Top Energy will undertake checks to confirm that no additional network extension or upgrade is required. If additional work is required, the team will get in touch with the Customer to commence a design and quote.

2. ICP created Energy Retailer informed

Once the required connection information is established, an ICP (Installation Control Point) is created for the new connection and is communicated to the Customer and their nominated Energy Retailer.

3. An electrician completes the customers service connection and requests livening

Once the electrician is ready to have the customers installation inspected and livened, they will

- Certify the installation;
- Request a meter installation through the customers Energy Retailer;
- Engage with their nominated Livening Agent to attend site to inspect and liven the connection. If a Livening Agent does not hold an electrical inspector registration, an independent inspection must be arranged.

4. When the property is ready connect to the network, the

- Metering equipment provider nominated by the Energy Retailer will attend site; and
- Top Energy authorised Livening Agent will attend site and, subject to the installation meeting the required standards, the installation will be livened to the Network.

5. The Livening Agent submits required livening records and supporting information to Top Energy.

6. ICP energisation date

On receipt of liven records from the Livening Agent, Top Energy will update the ICP details to The Registry.

Appendix 2: Network Connection & Livening Process

