



Utility-scale distributed generation process

Your guide to connecting renewable generation to the Powerco network



Ngā Ihirangi

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Whakatakinga

Introduction

Powerco is here to connect communities. We're committed to helping Aotearoa achieve its net zero by 2050 goal by enabling the energy transition and we support the connection of renewable generation wherever possible.

This guide provides information on how we work with utility-scale distributed generation companies to connect to Powerco's high-voltage network.

It provides a high-level overview so you can familiarise yourself with the connection options, delivery paths, indicative timeframes and costs - from your initial enquiry through assessment, design, build and commissioning.

This process applies to distributed generation projects of 1MW or greater.

Large scale connections between 10kW and 1MW follow a separate process: powerco.co.nz/get-connected/large-scale-connections

Small scale connections (up to 10kW), such as residential or small business solar, can be completed through our standard connection process. Your installer can usually apply on your behalf. More information is available here: powerco.co.nz/get-connected/solar-power-for-home-and-business

Code, policy and standards

We operate under Part 6 of the Electricity Authority's Electricity Industry Participation Code, which sets out the framework for connecting distributed generation to electricity distribution networks, like Powerco's.

We have additional supporting documentation to support this process, including:

- **Distributed generation policy**
Our core principles regarding enabling the connection of renewable energy generation on our distribution network.
- **Utility-scale distributed generation technical standard**
The technical requirements for connecting and operating utility-scale power generation to our distribution network.
- **Congestion management policy**
Our principles relating to distributed generation load congestion management.

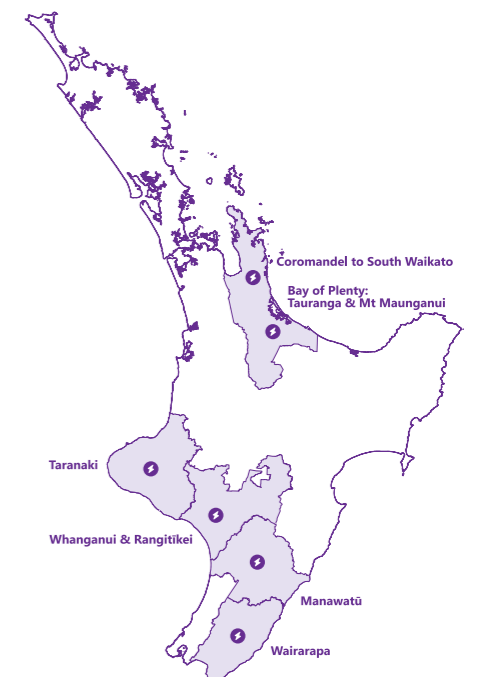
These documents are available to read on our website here: <https://www.powerco.co.nz/get-connected/utility-scale-generation>

Timeframes for enabling your connection

Designing and undertaking development on our network takes time, particularly for significant projects. Please contact us early in your planning process to ensure we can enable your distributed generation project in a timely way.

About Powerco

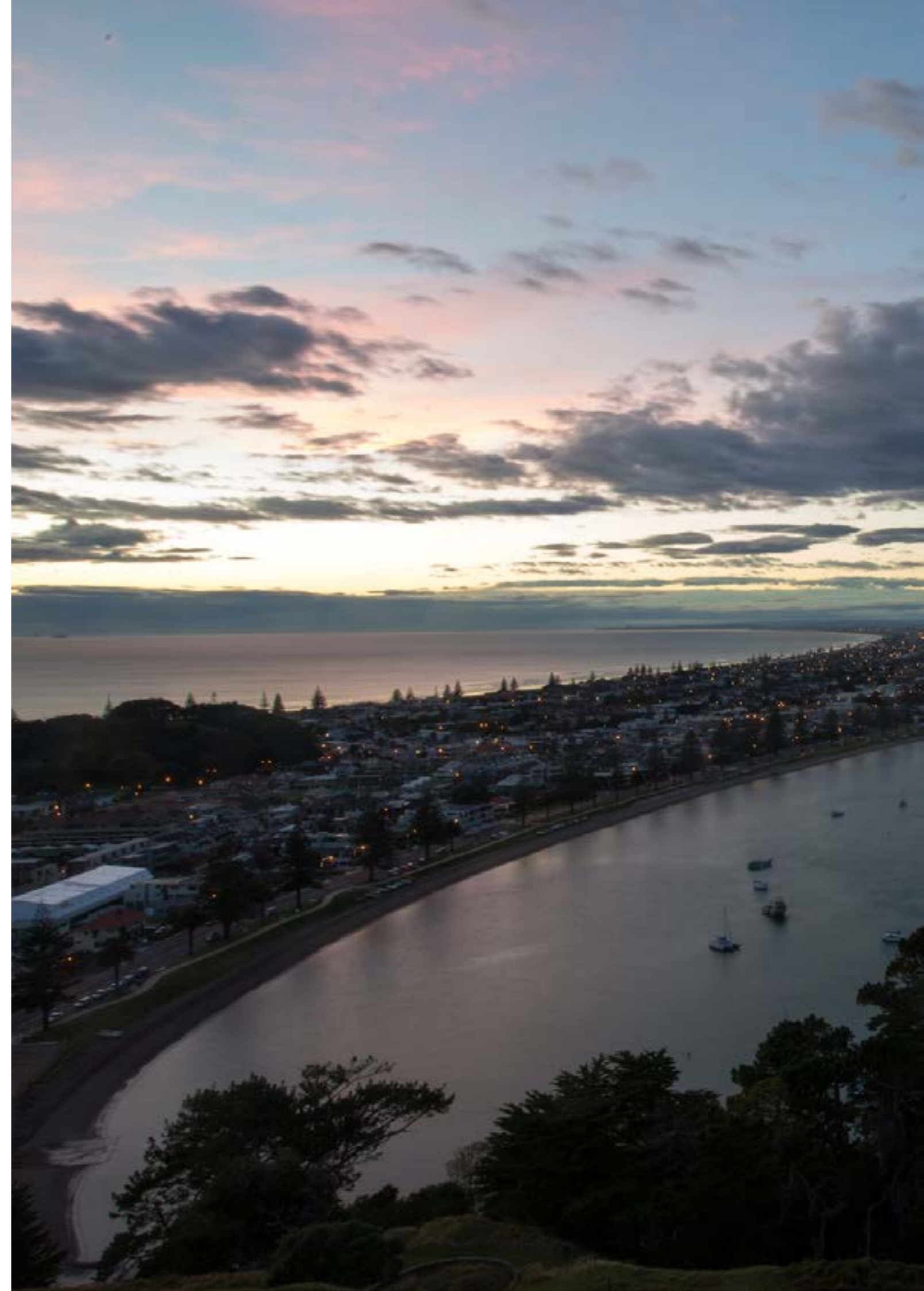
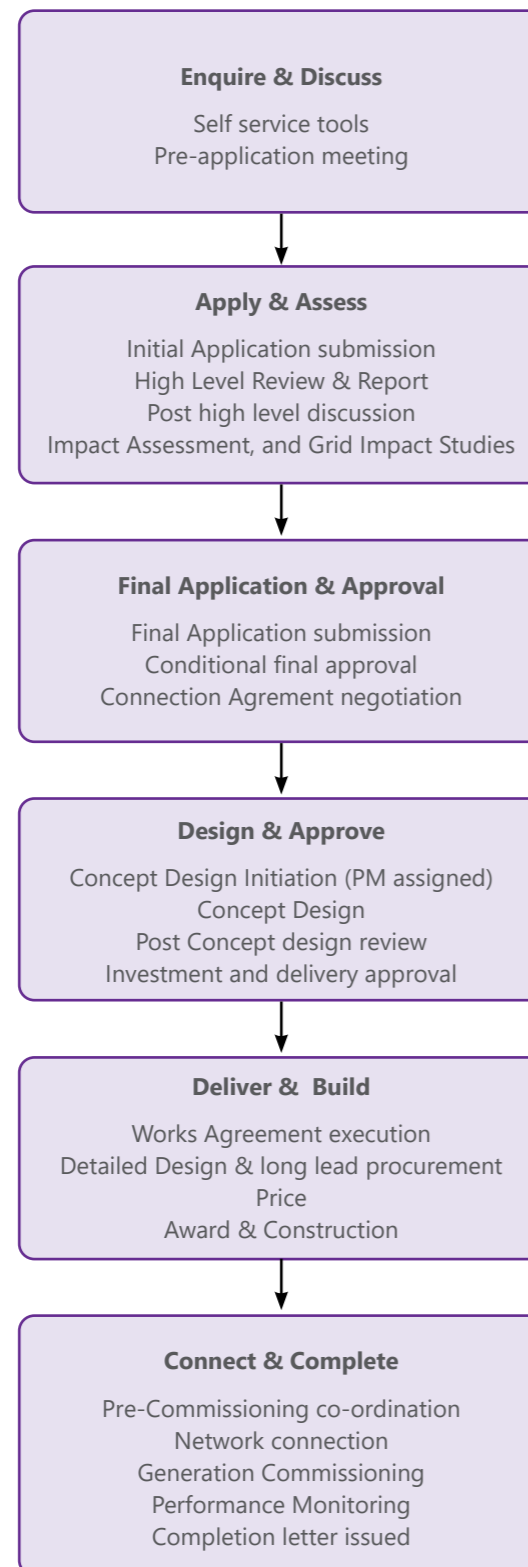
Powerco is a dual electricity and gas distribution owner and operator, serving customers across the North Island. On its electricity network, Powerco manages 29,296kms of overhead lines, underground cables and associated equipment, supplying 362,935 individual customer connections and approximately 736,500 customers.



Overview

This section provides an overview of the process you'll follow to connect your distributed generation over 1MW to our electricity network.

A more detailed explanation of each step is provided further in this guide.



Uiui, whakawhiti whakaaro hoki

Enquire and discuss

Pre-assessment – Self-service tools

Your first step is to check where our high-voltage network is located in relation to your site and whether there is existing capacity to safely accept your generated power.

You can do this by visiting the large-scale distributed generation hosting capacity map on our website here.

The map provides the location, estimated hosting capacity of our 11kV, 33kV, 66kV and 110kV lines and cables, and indication of recently committed or connected utility scale generation. Detailed assessment occurs during the application process.

You can also review our current pipeline of utility scale generation applications to understand demand in specific grid exit point regions here: powerco.co.nz/get-connected/utility-scale-generation/distributed-generation-connection-enquiries-electricity-network.

A more detailed explanation of each step is provided further in this guide.

Pre-application meeting

You may request a pre-application meeting to discuss your proposal with us. These meetings typically last 15-30 minutes and provide high-level, non-binding information. It may include:

- Indicative hosting capacity or reinforcements needed to support desired capacity
- Likelihood of impacting the national grid
- Ballpark cost ranges
- Overview of Powerco's connection process (ie key staging, costs and timeframes)

This session could assist you in deciding to prioritise prospective locations or with an initial application submission.

It is important to note that in the pre-application meeting, we cannot provide detailed network analysis, and any information is subject to change given current network demands, changes over time and the effect your generation may have on the network.

Information required before the pre-application meeting (minimum three working days prior):

- Generation type and capacity
- Battery energy storage system (if applicable)
- Location: address, map screenshot and ICP (if existing site)
- Capacity needs and preferred connection voltage
- If you have flexibility on capacity needs or location
- What you need from us from the meeting

For specific types of application, at the meeting we may explore further, your commercial structure and/or funding plans, where these may interact with our deliverable or contractual requirements.

To book a pre-assessment meeting, please complete the [preliminary information request form](#) and send through to UtilityScaleGeneration@powerco.co.nz.



Tono, tūhura hoki

Apply and explore

Initial application

To begin the connection application process, we recommend engaging a qualified electrical engineering consultant to assist you in completing your initial application. Your consultant will be able to help provide the technical information required.

Please complete the [initial application form](#) and send through to UtilityScaleGeneration@powerco.co.nz.

There is a cost of \$7,690 (GST excl.) for the review of your initial application and provision of the high-level assessment report output.

If you have any questions for us before you decide whether to start the initial application process, you can email us at UtilityScaleGeneration@powerco.co.nz.

High-level review

Once you have submitted your initial application to us we will review it and provide you with a high-level review. This review will give you an indication of technical feasibility and a high-level estimate for connecting your generation to our distribution network, including:

- Whether our network can accommodate your generation
- Our assessment of potential Transpower requirements (per Transpower impact assessment grid)
- High level scope of potential network development requirements (if any)
- Connection options covering network reinforcement requirements and how capacity reductions can avoid network reinforcement requirements (if applicable)
- Estimated network development costs
- Details about next steps

Based on the information we provide you in our high-level review, you'll understand whether our network has hosting capacity to connect you, and/or the development that may be required to accommodate your generation.

This section at a glance:

- If desired, request a pre-application meeting to discuss feasibility.
- To apply, complete the initial application form.
- Payment of application fee.

Key information



Preliminary information request form Initial application form.



\$7,690 to review your application.



You'll receive a response to your initial application within 30 business days.



powerco.co.nz/get-connected/utility-scale-generation to access our map and application forms.



Assessing impact

Initial application

Your next step will be to commission a Powerco preferred engineer to undertake an impact assessment which evaluates how your generation will affect network performance and safety. Requirements are outlined in the Utility Scale Distributed Generation Technical Standard and set out in the high-level report.

Impact assessment

The impact assessment output will then be reviewed by our network planning, substation design, protection design and power quality teams. Review typically takes 5-6 weeks depending on project size and complexity.

The cost for Powerco's review of the impact assessment studies is \$10,000 (GST excl.). We will invoice you for this review fee upon receipt of the assessment studies.

The output of the impact assessment review is an assessment register that informs any further discussion with you, and our consideration of a final application and the approval conditions that would apply.

- Depending on the information we need, the impact assessment will cover:
- System modelling showing the anticipated performance of the network once your generation is connected.
- Protection philosophy.
- That Transpower requirements can be met (if required).
- Power quality and harmonic requirements are demonstrated and mitigated where needed.

Powerco's performance requirements are documented in the Distributed generation 1MW and over Connection Standard to provide guidance on the information we'll need from you.

Transpower – Grid Protection Assessments

Transpower grid protection assessment requirements are per Transpower guidance document '[Grid Protection Assessments for Distributed Energy Resources](#)'.

Additional studies may be required given the context of your proposed generation requirements, our present network conditions, and other material present or future generation or load connections.

Relevant impact assessment outputs or additional studies for Grid Protection assessment would be submitted to Transpower for their protection team's review.

There could subsequently be requirement for Wide Area Protection studies later in the project timeline (detailed design).

Transpower – Grid Connection Application

We estimate Transpower grid impact per Transpower's impact assessment grid. In the event of:

- Impact assessment determining higher impact, and/or;
- Multiple applications increasing the impact assessment,

In the case where the review results in a connection to Transpower's grid, we will recommend application to Transpower's Connection Management Framework. Please see 'Connection Management Framework – Process Document'.

Following your confirmation to proceed and, acceptance of associated conditions and costs via the signing of an AWA. Powerco will submit Connection Application to Transpower on your behalf.

This section at a glance:

Impact Assessment

- We'll provide requirements for the impact assessment studies you'll need to complete to demonstrate how your generation will meet our performance requirements
- We'll review the impact assessment and provide any feedback.

Transpower Application

- Where identified as required, you can confirm with us to initiate an application to Transpower's Connection Management Framework.
- Since this process may take some time, it's best to start the process as soon as you know you'll need a Transpower investigation.
- Powerco applies to Transpower on your (and any other applicant's) behalf as the local network connected to Transpower's grid.
- Before we proceed, you must commit to each stage and costs of the CMF process.

Key information



Engineer engaged to complete impact assessment.



\$10,000 to review your impact assessment.



The review of the impact assessment will take 5-10 weeks, depending on its complexity.



Final application and approval

Following Impact Assessment completion and approval, you'll need to submit a final application to connect to our network. This must be submitted within 12 months of the date your initial application was submitted.

To avoid having your final application declined, you'll need to ensure the following before you complete and submit it to us:

- Our final application form has been used, and it has been filled out correctly.
- Your impact assessment has been submitted and approved, and any issues raised by it have been resolved.
- Transpower input (if required) has been sought by us, and an application made if needed.
- All payments have been made including your initial application and impact assessment review fee.

We will review your final application within 80 business day as per the Code (unless an extension is agreed by both parties) and then we will issue either;

- a conditional final approval letter outlining relevant conditions and/or technical requirements that must be met during the build of your connection, or
- a letter declining your final application, including the reasons for that decision.

There are no costs associated with the review of your final application.

Conditional Final Approval

The conditional final approval we issue to you may include the following;

Transpower system operator obligations, including additional studies to support system integration and meeting the costs associated with those studies and any transmission costs required by Transpower as the national grid owner.

Network upgrade requirements – works on the Powerco network required to support your proposed generation capacity.

Metering, connection and installation control point (ICP) requirements.

Detailed design - studies that determine or demonstrate protection and coordination settings, generation fault ride through capability and control scheme stability.

Project readiness and progress reporting – including any documentation required and pre-commissioning planning.

Operational requirements – specifics relating to how your generation connects to and exports electricity onto our network, including any operational limitations and/or coordination requirements.

Once conditional final approval is granted, you will have 18 months to meet the conditions of approval.

If these conditions are not met within this timeframe, your conditional final approval may expire unless otherwise agreed with us. The 18-month timeframe is set out by Part 6 of the Code and ensures capacity on our network is allocated fairly and efficiently.

Multiple Applications – Contesting Final Applications

In circumstances where there are multiple active applications which together will result in a constraint within Powerco's network, we will;

- Advise applicants as soon as practicable to there being the likelihood of a contesting scenario and provide you with more information.
- Once we have received and approved a final application, we will notify all other applicants. Those applicants have 20 working days to submit their own final applications.
- Assess and review all contesting final applications together.

This section at a glance:

Final Application

- Following completion of impact assessment, we will confirm progression to the final application stage and provide the final application form.
- The final application will be reviewed as per Schedule 6.2 of Part 6 of the Code. We will keep you informed of status and timeframes.
- Contesting applications are assessed and reviewed as outlined.

Contesting Applications;

- If there are multiple applications resulting in a contesting situation, we will notify all parties and provide overview of the approach to assessing the final applications.
- Conditional Final approval;
- Following final application review, we will provide a letter of draft final approval conditions
- Following your review and consideration of any comments, we will issue the final approval letter

Key information



Final application and contesting applications



There are no costs for final application submission & review



Final application approval timeframes:

- <1MW – 45 business days
- 1 to <5MW - 60 business days
- >5MW - 80 business days* * Excludes contesting applications

Hoahoa, whakaaetia hoki

Design and approve

Concept Design Initiation

When you are ready to proceed into Concept Design, we will commence Concept Design Initiation. This stage involves allocation of additional internal stakeholders to support the development of the concept design scope and provide ongoing facilitation and support.

We charge a standard fee for our internal costs associated with the Concept Design Stage;

- \$10,000 11kV connections
- \$40,000 33kV / grid exit point connections

Following your acknowledgment we will commence the CDR scoping, letting and revert to you with the preferred proposal.

The Concept Design Proposal provides scope of works and costs. To initiate the Concept Design, we will provide you with an Advance Works Agreement making commitment to the scope of works and respective costs.

Concept Design and Review

Once the Advance Works Agreement is in place, we will engage the Powerco preferred electrical engineer to undertake the concept design.

The concept design may include:

- Connection design options and preferred solution
- Build estimate and high-level schedule
- Major equipment requirements and purchase details
- Risk register
- Site investigations (geotechnical, ecological, flood risk, archaeological, contaminated soil), if required
- Further investigation of any issues identified in the Network Impact Assessment
- Easement and property consent requirements, if required.

During the concept design and review period, we will discuss any issues raised and work through them with you as required.

The completed concept design will be reviewed internally by our distributed generation, network planning, protection design, power quality, property and consents, and quality engineering teams and following sign off will be released to you.

This section at a glance:

- Following your commitment to our standard Concept Design support costs, we will scope the work and seek proposals
- To proceed with the preferred proposal, you must sign an Advance Works Agreement confirming scope and costs
- Once engaged, the Powerco preferred electrical design consultant will continue to be supported by Powerco stakeholders as the design progresses
- We will sign off on the final Concept Design Report and meet with you to review and discuss the outcomes.

Key information



Distributed Generation Guideline



Powerco Concept Design Support Costs – See Appendix.
Concept Design & Report – subject to scoping and pricing. Ranges from \$50,000 to \$200k plus.



Concept Design Scoping & Letting 4-6 weeks Concept Design – per consultants' proposal, ranges from 6 weeks to 6 months.



Works Agreement

Following your financial investment decision and/or close, and if you are ready to proceed, you will sign a Works Agreement with us before we start delivery.

The Works Agreement will detail the scope of work Powerco will undertake on our network to enable your connection and document your capital contribution.

The signed Works Agreement will authorise us to proceed with delivery. Your project will then be handed over to our project management team.

Terms of the Works Agreement include, but are not limited to:

- Scope, demarcation and ownership of the works.
- Delivery commitments.
- Costs and treatment of cost variations.
- Capital contribution and payment terms.
- Treatment of scope variations.
- Warranties.
- Powerco investment recovery provisions.

If you wish to proceed with detailed design ahead of executing a Works Agreement, we can proceed provided any associated financial commitments are underwritten, and/or paid in full before work commences.



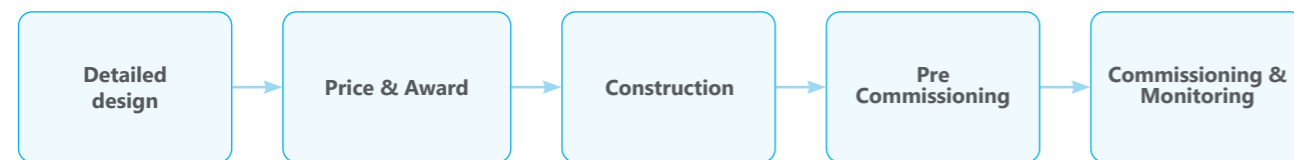
Whakatinana, hanga hoki

Deliver and build

Delivery pathway

Powerco will project manage construction, delivery of the network requirements ready for your generation plant connection and commissioning. We will work with you in a collaborative, open, and transparent way, establishing a project stakeholder team that consistently works together to deliver the network connection for your generation development.

Following entering a Works Agreement, the project will be led by the delivery project manager to oversee the established project stakeholder group.



Detailed design

Your concept design will be the basis for your detailed design. Detailed design provides assurance of the design and how construction will be carried out.

Powerco will undertake the detailed design or engage a Powerco-preferred engineering consultancy to complete it on our behalf.

Additional studies relating to property, environmental and geotechnical matters may also be undertaken at this time, if they were not done in concept design.

The detailed design will include:

- Scope of works and accompanying designs to build.
- Detailed risk register.
- Land access requirements are identified, and any required easements are negotiated.
- Transpower Access and Operation application (for grid exit point works, if applicable)

Detailed design will take between 6 and 14 months to complete, depending on project complexity and dependencies of carrying it out.

Combined Studies, Wide Area Protection

Where there are multiple applications seeking access to the same parts of our distribution network, further assessment may need to be undertaken to fully understand the potential effects of such multiple generators on the network.

Transpower also require studies to be provided for their review, per their Generation Connection Guidelines. These studies can also involve Wide Area Protection Studies depending on the context of your generation and Transpower Connection Management Framework.

Early procurement

Due to long lead times for certain equipment, early procurement may be necessary. We will discuss anticipated lead times with you and commence procurement. Where a Works Agreement has not been executed, orders will only be placed following your commitment to underwrite the associated costs.

Price and award construction

Using the completed detailed design, the project manager will price and award the construction work. This process typically takes between 6 weeks and 3 months.

Manage construction

The Powerco project manager will oversee the coordination of activities to deliver the network connection and associated support services as required (ie protection, communication and control). Regular project meetings will be established with internal and external stakeholders to ensure clarity and transparency. Regular site visits will also be undertaken to ensure milestones are being met and that completed work and materials align with the agreed scope of work.

Where required, the project manager and Powerco relationship representative will liaise with Transpower and you regarding the Transpower connection process, delivery and any other requirements.

This section at a glance:

- Following signing of a Works Agreement, our Delivery Project Manager takes full lead of co-ordination of your connection project through detailed design to construction.
- The network connection assets, and auxiliary services i.e. protection, communications are designed and delivered via our strategic projects process
- Combined and area studies may be required
- The project stakeholders will be in continuing co-ordination with you and your team as both our network works, and your generation development are delivered.

Key information



Detailed design, Pricing & Award, Construction



Actual Costs, plus internal support costs per Works Agreement



Timeframe is scope and resource dependent

Hono, whakaoti hoki

Connect and complete

Commissioning staging

The following provides a general overview of Powerco's requirements for commissioning and network testing of USDG installations and connections to our network.

A detailed and project-specific commissioning plan will be developed with your commissioning agent for the specific USDG installation.

This guide does not supersede or take precedence over the requirements of Powerco's USDG standard, any operational standards or any connection agreement.

There can be up to three stages regarding accessing the network, requiring up to three separate Network Access Permit Applications (NAPA) as follows:

NAPA Stage 1 - Network interconnection equipment installation and livening

- Network Access Permit Application (NAPA) to be submitted by Powerco-approved network contractor installing the network equipment for the USDG connection.
- Lead time is typically minimum 8 weeks prior to commissioning.
- Several NAPAs may be required at this stage to achieve the necessary network configuration.

NAPA Stage 2 - Liven HV connection to USDG plant

- NAPA must be submitted by Powerco-approved network contractor responsible for livening the USDG connection.
- Lead time is typically minimum 8 weeks prior to commissioning
- A commissioning plan and test plan for the USDG installation must be submitted for review. These plans are usually developed by the USDG commissioning agent in liaison with Powerco's commissioning agent.
- Lead times for the delivery of the commissioning plan and test plan for review is as per the USDG standard (currently 8 weeks prior to commissioning).
- The switching for this stage is used as Powerco's pre-requisite gateway. - all pre-requisites, internal and external, to be met prior to livening the connection.

NAPA Stage 3 – USDG / Network Performance (Export) Testing

- This application covers off any network operation or activity required because of the network export testing of the USDG.
- NAPA will be submitted by Powerco after consultation and agreement with the USDG commissioning agent. Actions will generally follow the commissioning and test plan submitted by the generator and will be integrated with any other Powerco requirements.
- A Switching Methodology Spreadsheet will be developed by Powerco for the network testing stage which will reference the USDG test plan and be used as the running sheet on the day.
- For generation greater than 1MW, Transpower protection authorisation must be received prior to commissioning.

Completion

After commissioning and a performance monitoring period, Powerco will issue a Completion Letter. This letter will confirm project completion, commencement of the connection agreement terms, documentation of respective conditions met, varied or waived, and any other matters to ensure clarity of the connection attributes and operating parameters while connected to the network.



Supporting information

Our agreements explained

Advance Works Agreement

Prior to signing a Works Agreement, you may enter into one or more Advance Works Agreements with us. An Advance Works Agreement sets out the terms on which we agree to undertake, and you agree to pay for, any 'advance work' prior to a Works Agreement being signed. Examples of advance works include:

- Concept design review
- Ordering long lead equipment (eg transformers)
- Carrying out detailed design of the works
- Obtaining investigations or technical reports (eg geotechnical)
- Preparation of resource consent applications

Works Agreement

Before we start network development, we will agree the final scope of work and your capital contribution, and this will be recorded in a Works Agreement. Once the Works Agreement is signed, Powerco will engage a Powerco-approved contractor to design and carry out the works.

Land Purchase Agreement

In certain circumstances, we may need to purchase land from you, for example, where your project requires a substation to be built on your land. We use the template Auckland District Law Society (ADLS) Agreement for Sale and Purchase, which sets out the details of the land being sold and the terms and conditions of the transaction.

Connection Agreement

For some large customers, we enter into a Connection Agreement. These agreements detail the terms and conditions under which you are connected to and receive lines services from our network. If you have a Connection Agreement with us, you will be billed directly by Powerco for lines charges rather than through your retailer. You will have a separate agreement with your retailer for the electricity you purchase.

Easement Agreement

To connect your project to our network, certain electrical equipment may need to be installed on your land. This may include overhead poles and lines, underground cables, transformers and switchgear. An Easement Agreement grants Powerco the legal right to install and maintain this equipment on your land. The equipment remains our property, and we are responsible for its maintenance. An Easement Agreement also gives us the right to access your property when we need to inspect or maintain the equipment. An easement is registered on the land title and remains in place even if the land is sold.



Glossary

Capacity

The amount of electricity available for customers to use.

Distributed generation

When customers who generate their own power (eg solar, wind, liquid fuel) connect to a distribution network.

Easement

A legal right to use another person’s land for a specified purpose, such as installing equipment (eg poles, overhead lines or transformers) on a customer’s (or their neighbour’s) land.

kW

Kilowatt. 1,000 watts.

Load

The amount of electricity you draw from the network to run your operations.

Peak load

The highest amount of electricity you use to run your operations during a specific period (eg when all machinery is in use during peak production periods).

MVA

Megavolt-ampere, 1,000kVA.

MW

Megawatt. 1,000 kilowatts.

N-1 security

N-1 security is uninterrupted electricity supply. N-1 security involves building contingency into an electricity supply solution so that in the event that the primary source of supply is interrupted, supply will come from a second source.

Powerco contractor

An electrical or gas contractor engaged to carry out work on Powerco’s network.

Short circuit ratio

Definition here

Transpower

The state-owned enterprise that owns and operates New Zealand’s national electricity transmission grid.

Contact us

To get in touch about the utility scale distributed generation process, email UtilityScaleGeneration@powerco.co.nz.

Appendix – Costs

Activity	Description	11kV Connection*	Complex
33kV Initial Application Fee	Per Part 6	\$7,690 (GST excl.)	\$7,690 (GST excl.)
Impact Assessment Review	Internal Powerco FTE cost allocation - Standard average cost	\$10,000 (GST excl.)	\$10,000 (GST excl.)
Concept Design Initiation Advance Works Agreement	Internal Powerco cost for scoping, supporting and completion of Concept Design	\$10,000 (GST excl.)	\$40,000 (GST excl.)
Delivery, commissioning and operational support costs	Internal Powerco cost supporting project delivery from Works Agreement to completion	>5MW \$64,795 (GST excl.)	TBC

