TRANSPOWER

Guidance for developers establishing Wind Farms near Transpower Assets

July 2025

Note – this guide is limited to development of wind farms near the National Grid. For information about connecting to the National Grid please visit our website.

Overview

Development near National Grid assets must be planned carefully to ensure safety risks are not created or compromise the operation, maintenance, upgrade, and development of the Grid.

In particular, development must:

- Not compromise the operation, maintenance, upgrading and development of the National Grid (as provided in the ***National Policy Statement on Electricity Transmission 2008*** *(NPSET);*
- *Comply* with the mandatory safe separation distances in the ***New Zealand Electrical Code of Practice for Electrical Safe Distances*** *(NZECP34:2001);* and
- comply with District and Regional Plan rules

Transpower encourages developers to plan the location of wind turbine structures in accordance with the guidelines below.

This is so that failure of wind turbine structures, or the downwind wake caused by the wind turbine, do not have a negative impact on Transpower's assets. Having an appropriate setback from transmission lines has important safety benefits such as preventing damage to property and risk of harm to people.

It is important to recognise that some of the National Grid is protected by easements and/or designations so different requirements, about what type of land use is appropriate, may apply.

Connection to the National Grid

You should contact Transpower as soon as possible to discuss your connection to the National Grid (if one is required). Working out the demarcation between what assets you will construct, own, and operate, and those which Transpower will construct, own and operate, is a key part of understanding the best pathway forward for obtaining environmental approvals and property rights.

All connection enquiries must go through Our Connection Process. In advance of that process, Transpower can provide comment on how to appropriately develop around the National Grid in a way that does not negatively impact on its assets, or our ability to operate, maintain, upgrade, and develop them.

Importantly, applying for resource consent and/or property rights for a wind farm in advance of an investigation into the connection arrangements required with Transpower is at the developer's risk. It is possible that changes might be needed to the layout or design of the wind farm, or that a connection at the desired location is not feasible.

If your wind farm requires a Grid connection, Transpower will need to assess what environmental approvals are required depending on the type of connection arrangement and ownership of assets. This will need to be discussed early on with the developer.

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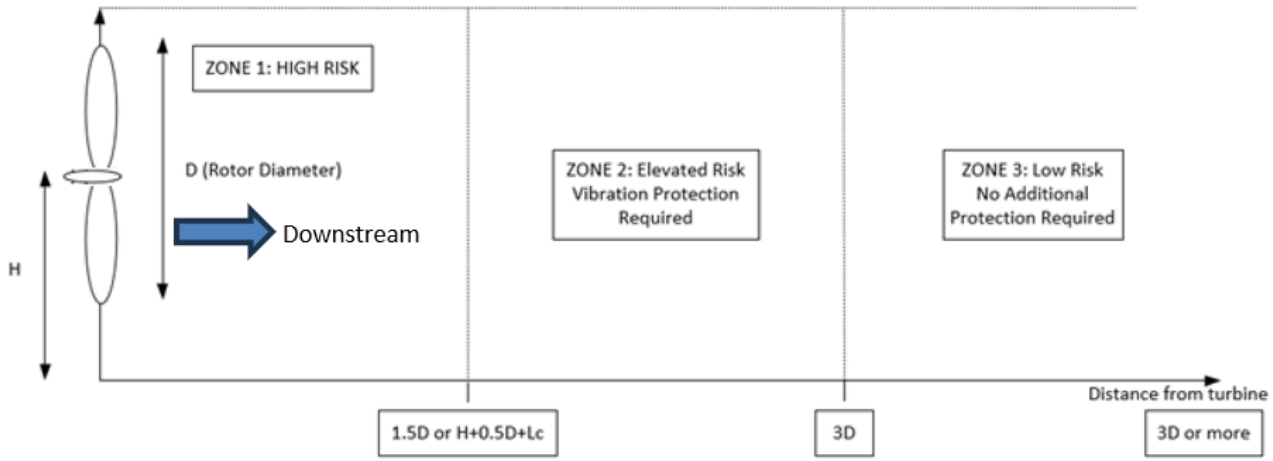
Wind turbine setbacks

Wind turbines pose multiple risks to transmission lines such as downstream turbulence, the potential fall risk and blade throw. As such, distances to transmission lines need to be checked to ensure that any potential impacts are identified and mitigated as needed.



The following zones have been identified as guidance for the placement of wind turbines in the vicinity of transmission lines:

Zone 1 (Exclusion zone)
No transmission line shall be present.
This zone extends from the turbines base to the greater of:

- 1.5 × Blade Diameter (D)
  OR
- Height of the nacelle (H) + 0.5 × Blade Diameter (D) + Electrical Clearance (Lc)

Electrical clearance = 4m as per NZECP34 to maintain MAD to avoid electrical flashovers.

Zone 2 (Elevated risk zone)
Within this zone there is an increased risk of line component damage due to wind-induced conductor vibration in the turbine's wake. A risk assessment and wind modelling must be carried out if the turbine's position is within this zone. Vibration protection may be required on the transmission line at the expense of the generator.

This zone extends from 1.5D to 3D where D = the diameter of the turbine blades

In this zone, if the affected line is a tee-off line and is feeding only the windfarm, the wind turbines can be placed as close as the windfarm owner permits, provided that the tee-off is not a hard-tee and will not have system implications to the National Grid in the event of faults.

If the transmission line is feeding a wider area, the following studies are recommended:

- Vortex shedding effects
- Downstream wake induced turbulence
- Inclusion of predominant wind loads in the above two points (i.e. addition of loads the line was designed for, and the site-specific loads that the structures will experience)
- Failure of turbine components (fling distance)

The studies need to prove that the vortex shedding and wake induced effects are no larger than the allowed sustained and gust design wind loads, and that vibration of the conductors, due to the wake induced effects, can sufficiently be mitigated.

Zone 3 (Low risk zone)
The risk to the transmission line is deemed acceptable. No additional vibrational protection or studies will be required for the transmission line.

This zone is for distances greater than 3D where D = diameter of the turbine blades.

New Zealand Electrical Code of Practice for Electrical Safe Distance (NZECP34:2001)

NZECP34 specifies minimum safe separation distances for buildings/structures, earthworks, mobile plant and people from transmission lines and support structures. These minimum safe distances have been set to protect persons, property, vehicles and mobile plant from harm or damage from electrical hazards. NZECP34 is a regulation under the Electricity Act and compliance with its provisions is mandatory.

Earth Potential Rise (EPR) assessment

EPR is the potential for towers, poles, and substations to transfer high voltage and dangerous currents into the ground during a lightning strike or fault on the transmission line. Transpower considers that mitigation measures may need to be implemented where the site is within 100 metres of a tower, pole, or substation, to manage the risk of potential EPR hazard, as a result of the proposed works.

Please be aware that Transpower requests the wind farm developer contact our approved Engineering Consultants (EC) to commission an EPR assessment at their own cost. Any EPR mitigation recommended in the final report should be considered in the design and construction stages of the wind farm development.

The developer should contact Transpower Operational Engineering for advice on whether an EPR assessment is required by emailing a location plan and any supporting information to epr@transpower.co.nz.

Preparation of resource consent

Transpower considers that it is an affected party to any resource consent for a wind farm within 500 meters of any National Grid asset or requiring a connection to Transpower's transmission network. This is due to the potential effects of the proposed work on National Grid assets and the potential effects of the National Grid on the wind farm.

To help decision makers assess whether there are any potential adverse effects on National Grid assets, it is strongly recommended that the resource consent application includes the following:

- A section on the potential effects on the National Grid and the outcome of engagement with Transpower;
- Plans that clearly show the National Grid assets (including name of transmission line and structure numbers and any substation); and
- Any conditions requested by Transpower to be included in the resource consent application.

Transpower requests that the developer provides a draft copy of any site plans and the resource consent application for review and comment, ahead of it being submitted. This is so Transpower can help ensure that the design, construction, operation, and maintenance of the wind farm won't have any potential or actual adverse effects on the National Grid. Draft applications and supporting documents can be emailed to transmission.corridor@transpower.co.nz

An example of the consent conditions Transpower may require to be included by the applicant in its consent application is available on request.

Note that any RMA (Resource Management Act) affected party approval provided by Transpower for a resource consent application associated with a wind farm does not constitute agreement that a connection is appropriate or feasible. Only by going through Our Connection Process can the feasibility of a connection be determined.

Further information

You can also find further information regarding development near the National Grid (including our *Development Guide)* on our website https://www.transpower.co.nz/our-work/landowners-and- developers/developers

If you would like to discuss developing your wind farm near the National Grid, please contact our Environmental Policy and Planning ground at transmission.corridor@transpower.co.nz.

If you would like to discuss the connection of your wind farm to the National Grid please contact our Customer Team at customersolutions@transpower.co.nz or visit https://www.transpower.co.nz/connect-grid