

Distributed generation electricity network



Avoided cost of transmission methodology

Effective 1 April 2016

This document describes the methodology Vector uses to determine the Transmission Costs from Transpower that are avoided as a result of injection of energy into the local distribution network by a Distributed Generator ("DG"); and how these avoided Transmission Costs will be considered for individual DGs.

Overall principles

In determining the Avoided Cost of Transmission ("ACOT"), Vector has adopted the principles included under Part 6 of the Electricity Industry Participation Code 2010¹. These principles provide that Vector must include consideration of the incremental costs (net of transmission and distribution costs) that an efficient service provider would be able to avoid as a result of the connection of the distributed generation.

Vector's approach to considering the incremental ACOT produced by the DG is by reference to the amount by which Transpower reduces Transmission Costs (as against what would otherwise have been the case) due to the DG being connected within Vector's distribution network; and/or by reference to the amount of electricity produced by the DG at the time that Transmission Costs are determined by Transpower.

Eligibility of DG for ACOT

In order for a DG to be eligible to receive ACOT payments from Vector, the DG must have an agreement² with Vector for the connection of generation plant or equipment to Vector's electricity distribution network. This includes compliance with Vector's connection requirements, operating standards, import/export metering requirements, and all technical requirements under the Electricity Industry Participation Code 2010.

Transpower's Transmission Pricing Methodology

The methodology used by Transpower to determine transmission charges is outlined in Part 12 of the

Electricity Industry Participation Code. This can be found on the Electricity Authority's website at:

<http://www.ea.govt.nz/code-and-compliance/the-code/>

Although the Transmission Pricing Methodology contains a number of transmission charge components, the connection of a DG predominantly affects the interconnection charge component that Vector is charged by Transpower. This is due to the interconnection charge being a variable charge based on local distribution network demand; whereas the remaining charges are fixed charges based on the use of sunk transmission assets. Due to this, only interconnection charges are considered in Vector's Avoided Cost of Transmission methodology.

The purpose of the interconnection charge is to recover the portion of Transpower's AC revenue (as defined in the Transmission Pricing Methodology) that is not already recovered via their connection charges. The Transmission Pricing Methodology determines the Interconnection Rate by dividing the required interconnection revenue by the sum of the average of the Regional Coincident Peak Demands ("RCPD") for all Transmission Regions, which includes all Grid customers and connection locations across the country.

This approach (explained further in Schedule 12.4 of the Electricity Industry Participation Code) determines a single Interconnection Rate applied to the RCPD for each of the four large Transmission Regions (Upper North Island, Lower North Island, Upper South Island and Lower South Island).

¹ See in particular clause 2(a) Schedule 6.4 Electricity Industry Participation Code.

² An agreement can be either in the form of the regulated terms or a negotiated agreement.

Avoided Cost of Transmission Methodology

Vector calculates the transmission interconnection charges that are avoided as a result of the connection of distributed generation by determining the amount of demand avoided because of injections from the DG during RCPD periods. This avoided demand (due to injection by the DG) is multiplied by Transpower's published Interconnection Rate and an Interconnection Adjustment Factor ("IAF") to determine the total ACOT.

The calculation for determining the annual ACOT for an individual DG is as follows:

$$\text{ACOT} = (\text{RCPD}_{\text{DG}} \times \text{Interconnection Rate} \times (1 - \text{IAF})) - \text{AF}$$

The IAF is an adjustment that is applied to ensure only the incremental cost of avoided transmission is calculated. The IAF arises because for each Pricing Year Transpower has a fixed revenue requirement to recover through the application of the Transmission Pricing Methodology. If injections from a DG result in reductions to RCPD in any one year, then under the Transmission Pricing Methodology the Interconnection Rate increases to deliver the same revenue requirement had the DG not reduced the RCPD. The IAF effectively mitigates for Vector's end-consumers the effect of the decrease in the RCPD and the consequential increase in Interconnection Rate caused by injections from the DG. The effect of the IAF is that only the net incremental reduction in transmission cost caused by the DG is measured after any increases in the Interconnection Rate.

Timing of Transmission charges & ACOT

The Capacity Measurement Period precedes the Pricing Year that the interconnection charges are applied. This has the effect that under the Transmission Pricing Methodology a DG may not receive any avoided transmission benefits for up to 19 months after injecting electricity into the local distribution network.

Vector determines the ACOT payable to the DG with respect to the Pricing Year that:

- (1) Vector receives the incremental transmission saving (avoided Transmission Costs) from Transpower; and
- (2) Vector is able to factor the ACOT within the regulated distribution charges to end-consumers.

For the avoidance of doubt, for new and existing DG, ACOT will be determined following the end of the Capacity Measurement Period and applied effective from 1 April in the forthcoming Pricing Year.

Payment of ACOT

Prior to the beginning of each Pricing Year, Vector will advise each DG of their annual ACOT (as determined under this methodology) and provide a suitable purchase order number for invoicing purposes.

Vector will make monthly ACOT payments to each DG, following receipt of a suitable invoice from the DG including the relevant purchase order number.

Changes to Vector's Avoided Cost of Transmission methodology

The method by which Transmission Costs are incurred by Vector (as transmission counterparty) is determined largely by parties other than Vector. Vector may change its Avoided Cost of Transmission methodology from time to time to reflect changes in the Transmission Pricing Methodology (and associated Transmission Costs), or any other regulatory or legislative change affecting Transmission Costs or Vector's ability to recover these costs from its end-consumers.

When making changes to the Avoided Cost of Transmission methodology, Vector will attempt to align the Avoided Cost of Transmission methodology with the way costs are incurred as far as is practicable considering the practicalities of allocating these to multiple parties.

Definitions

Administration Fee (AF) means Vector's estimate of the administrative costs in determining the ACOT, recovering the ACOT from end-consumers and distributing the ACOT to DGs. This administrative cost is netted against the ACOT payable in any one year and may result in an invoice to the DG in the event that the administration fee is greater than the ACOT. The administration fee is currently \$1,000 (excluding GST) per year for each DG.

Avoided cost of Transmission (ACOT) means the incremental transmission saving created by and payable to the DG as determined by Vector from time to time in accordance with the formula in 1.4 above.

Capacity Measurement Period means, for a particular Pricing Year, the 12 month period from 1 September to August 31 immediately prior to the start of the Pricing Year.

Distributed Generator (DG) means a party with whom Vector has an agreement for the connection of plant or

equipment to Vector's electricity distribution network where the plant or equipment is capable of injecting electricity into Vector's distribution network.

Electricity Industry Participation (Code) 2010 refers to the current industry regulation as set by the Electricity Authority.

Grid Customers means the parties that have assets directly connected to Transpower's transmission network (Grid).

Interconnection Adjustment Factor (IAF) means the percentage by which the Interconnection Rate would need to be adjusted to account for the presence of DGs as specified in this methodology.

$$\text{IAF} = \text{Vector's RCPD} \div \text{National RCPD}$$

Interconnection Rate means the interconnection rate as published by Transpower for the relevant Pricing Year.

Loss Factor means the factor as determined by Vector from time to time to adjust energy injected at the DGs location into equivalent energy received from the nearest Transmission grid exit point.

National RCPD means the sum of the four Transmission Region RCPD's during the Capacity Measurement Period(s), as determined by Transpower each year.

Pricing Year means the 12 month period from April 1 to March 31, each year.

RCPD_{DG} means the average of the DG's metered half hourly injection (measured in kW) adjusted for losses, during Regional Coincident Peak Demand Periods. The loss adjustment is made by multiplying the injection measured at the DG's export meter by the Loss Factor.

Regional Coincident Peak Demand (RCPD) means for a Transmission Region, the sum of the off take (measured in kW) in that Region during Regional Coincident Peak Demand Periods, as determined by Transpower each year.

Regional Coincident Peak Demand Period means for the Upper North Island, a half hour in which any of the 100 highest regional demands (measured in kW) occurs during the Capacity Measurement Period for the relevant Pricing Year.

Transmission Costs means the transmission charges that Vector incurs from Transpower.

Transmission Pricing Methodology means the methodology used by Transpower to determine its transmission charges as outlined in Part 12 of the Electricity Industry Participation Code, as published by the Electricity Authority from time to time.

Transmission Region means the four regional groups of connection locations, as defined in Transpower's Transmission Pricing Methodology. The four regions are the Upper North Island, Lower North Island, Upper South Island, and Lower South Island.

Transpower means Transpower New Zealand Limited and any successors or permitted assignees.

Upper North Island (UNI) means the geographical area north of Huntly, including Glenbrook, Takanini, Auckland and the Northern Isthmus, as defined in Transpower's Transmission Pricing Methodology.

Vector means Vector Limited and any successors or permitted assignees.

Vector's RCPD means Vector's off take during the Upper North Island Regional Coincident Peak Demand Periods, as determined by Transpower each year.