

# Network Loss Methodology

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# Contents

What is the purpose of this document?.....	3
What are network losses?.....	3
What key principles apply? .....	3
What are Electra’s calculated losses? .....	3
How are losses calculated? .....	4
How are losses applied?.....	5
What regulation does this relate to? .....	5
Definitions.....	5
When will this policy be reviewed? .....	5



## What is the purpose of this document?

The purpose of this document is to capture the process Electra has used to assess technical and non-technical losses, to calculate the loss factors effective to the distribution of electricity to connected households and businesses in the Kāpiti and Horowhenua districts.



## What are network losses?

Network losses refer to the electricity that is ‘used up’ or ‘lost’ as it travels through the delivery system from the transmission network (the grid exit point) to a customer’s home or business. As electricity moves through power lines, a portion of it is naturally lost as heat due to the resistance in the wires. These losses are typically higher when electricity must travel long distances or over lower-voltage lines. These are categorised into four types:

- **Technical losses** - these are the physical losses that are an unavoidable part of moving electricity. They are primarily caused by the heating of network equipment like transformers, power lines, and cables
- **Non-technical losses** - these are unexplained losses where the amount of energy actually used at connection points doesn't match the amount reported by electricity traders. These differences usually come from theft, metering errors (like faulty equipment or incorrect setups), or mistakes in data handling and office systems
- **Reconciliation losses** - this is the total figure that combines both technical and non-technical losses. It represents the overall difference between the energy put into the network and the energy taken out.
- **Unaccounted for electricity** - this is the final gap or leftover difference between predicted energy volumes and what is actually measured. It accounts for any discrepancies remaining after the reported energy has already been adjusted for the calculated losses.



## What key principles apply?

This methodology was developed pursuant to the Electricity Industry Participation Code 2010 and is aligned with the Electricity Authority’s Guidelines on the calculation and use of loss factors for reconciliation purposes.



## What are Electra’s calculated losses?

For the period from 1 April 2026 to 31 March 2027, the following losses will apply.

### Reconciliation Loss Factors

Code/ICP	Description	Loss Factor Code	Loss Factor
Electra Network	Low Voltage Connections	1	1.071
0110007806EL3CF	Mangahao King Country Energy	MHO1	1.000

## Losses by Category

Description	Losses
<b>Total Technical Losses</b>	4.71%
<b>Total Non-Technical Losses</b>	1.89%
<b>Total Losses</b>	6.60%

## Technical Losses by Network Study Area

Description	Technical Losses
<b>Northern</b> (from the Mangahao GXP)	5.80%
<b>Southern</b> (from the Paraparaumu GXP)	4.10%



## How are losses calculated?

For the purposes of calculating losses, the Electra network is split into two distinct study areas. The Northern area, normally supplied from Transpower's Managahao GXP, and the Southern area, normally supplied from the Paraparaumu GXP, represent two areas that can be studied independently.

Loss calculations are performed using the following methods:

**Technical Losses:** are calculated using a range of modelling software and formulae within each network study area. The guidelines require that we undertake this assessment at least once every five years or when major changes to network topology or connections occur. It is an estimate with an assumed accuracy of  $\pm 20\%$ .

Technical losses were last calculated in November 2021, studying the period ending August 2021. There have been no major topology or connection changes warranting reassessment however a new study will be completed within the 2026 calendar year to apply from April 2027.

**Reconciliation Losses:** are calculated as the difference between reported energy injected into the network (PEMS.i) and reported energy extracted (PGR265.e).

The sum of real power injected into our network is obtained from metering data sources at the connection points to the Mangahao and Paraparaumu GXPs (PEMS.i). The energy that exits Electra's network is extracted from the Reconciliation Manager's report GR265 (PGR265.e). i.e.

$$\text{Reconciliation Losses} = \text{PEMS.i} - \text{PGR265.e}$$

**Non-technical Losses:** Calculated by subtracting technical losses from reconciliation losses. i.e.

$$\text{Non Technical Losses} = \text{Reconciliation Losses} - \text{Technical Losses}$$

**Unaccounted for Electricity:** Determined by the difference between reported injected and extracted energy after it has been adjusted for losses.



## How are losses applied?

The reconciliation loss factor is used as a multiplier applied to the volume of energy measured at a point of connection. This scales the volume to account for the attributed reconciliation loss relevant to that specific connection point.



## What regulation does this relate to?

This policy has been developed with consideration given to:

- The [Electricity Industry Participation Code 2010](#), specifically clause 7(1)(e) of Schedule 11.1
- The [Guidelines on the calculation and use of loss factors for reconciliation purposes](#).

Related information on Electra’s pricing and disclosure requirements is available on the website:

- [Prices - Electra](#)
- [Disclosures - Electra](#).



## Definitions

The policy contains terms that are used internally to Electra and across the industry and have a certain meaning that is important for understanding this policy:

<b>Connection</b>	The point on the system network where the consumer is connected. In most situations this is also the point where the responsibility for the equipment that conveys electricity transfers from Electra to the consumer
<b>Consumer</b>	The person who is responsible for the energy consumed at a Connection
<b>Consumption</b>	The measurement for use of electricity over time. Typically measured in kWh, it reflects the electrical energy consumed by a 1-kilowatt appliance in an hour
<b>Electra</b>	Electra Limited trading as Electra
<b>ICP</b>	Installation Control Point is the point at which a retailer is deemed to supply electricity to you. Each ICP is assigned a unique number. ICP numbers are shown on all electricity accounts
<b>Registry</b>	The database of record used by retailers, distributors and metering equipment providers to configure information about installation connection points (ICPs)



## When will this document be reviewed?

This document will be reviewed annually to capture technical loss studies, changes in legislation and changes in the configuration of our network.