Network Loss Factor Methodology 2025-2026

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1. Introduction

The Electricity Industry Participation Code requires that Electricity Distributors calculate and publish a loss factor for each loss factor code in the registry. As these loss factors are used by the Reconciliation Manager in allocating volumes of energy at Grid Exit Points to market participants, they are referred to in this report as reconciliation loss factors (RLFs).

This report presents the RLFs that should be applied to each customer's metered energy to recover upstream losses on Top Energy's Network (TEN) for the financial year 2025-2026. It also outlines the methodology, assumptions and data used for the calculation of the RLFs.

The methodology described in this report is based on the requirements set out in the Electricity Authority's "*Guidelines on the calculation and the use of loss factors for reconciliation purposes V2.3*[I]" issued on 26 June 2018.

To calculate the Technical Losses at each stage of the Network, DigSILENT PowerFactory was used. Top Energy's network model is detailed to the HV terminal of distribution transformers.

This Network Loss Factor Methodology is available from Top Energy's website at http://topenergy.co.nz/network/network-disclosures http://www.topenergy.co.nz/network-network-disclosures.shtml

2. Background

Reconciliation Losses are the difference between the total energy injected into the network and the total energy withdrawn from the network at the consumer connection points. These can be measured directly using metering data and include both technical and non-technical losses.

Technical losses are a physical consequence of the transfer of electricity over the network. They occur over all parts of the network and vary with voltage, line length, conductor size and the amount of power being transferred. Technical losses form most of the total reconciliation losses and, while they cannot be measured directly, they can be estimated to a high level of accuracy through mathematical analysis and computer modelling of network performance.

The Guidelines require technical losses attributable to consumers connected to different parts of the network to be separately calculated. Technical losses arising from the supply of electricity to consumers directly connected at high voltage will be lower than the losses incurred in supplying electricity to consumers connected to the low voltage network and hence RLFs applied to high voltage metering points will be lower than those applied to low voltage meters. However, due to the vast number and significant diversity of the customers connected to the distribution network, it is not feasible to measure or calculate the losses caused by each individual customer and so some level of averaging is necessary. Typically, this means that all consumers connected at a given voltage level are attributed the same level of technical losses.

Non-technical losses arise through metering errors, theft, and errors in the back-office processing of electricity accounts by retailers. There is no way they can be measured or directly estimated so they

I This document can be made available from http://www.ea.govt.nz/ This document contains detail requirements and criteria required by the Electricity Authority for loss factor calculation, methodologies, and processes.

are normally derived by subtracting the estimated technical losses from the directly measured reconciliation losses.

An RLF is normally expressed as a multiplier and is used to estimate the total energy that needs to be injected into the network to produce the measured consumption at each ICP. The RLF is calculated as 1/ (1-loss ratio) where the loss ratio equals the average proportion of losses over the network in the delivery of electricity from the point of injection to each metering point.

The Guidelines recommend calculating site-specific RLFs for large loads with significant network impact, while the Code mandates site-specific RLFs for generators with a rated capacity of 1 MW or more. For large consumers, Top Energy calculates a site-specific RLF for the Juken Nissho board mill near Kaitaia. However, due to the relatively low annual consumption of the AFFCO plant near Moerewa, the cumulative RLF for the metering point location (RLF B) is applied. For embedded generation, Top Energy calculates site-specific RLFs for the Ngawha A and B geothermal plants, Kaitaia Solar Farm and Pukenui Solar Farm.

The non-site-specific loss ratios used to calculate the RLF's in this report are calculated for each voltage level. The RLFs representing the energy losses at each network voltage level are applied to the total energy delivered at that voltage level of the network, irrespective of whether the energy is delivered to consumers connected at that voltage or to consumers connected at a lower voltage.

3. Definitions and Abbreviations

1. EA: Electricity Authority
2. RLF: Reconciliation Loss factor
3. Embedded Generation: A generator which operates one or more generating units that are directly connected to a distribution network and injects energy into a distribution network.
4. SCADA: Supervisory Control And Data Acquisition: SCADA systems are typically used to perform data collection and control at the supervisory level in a distribution network.
5. LLF: Load Loss Factor: The LLF is the ratio between the instantaneous losses incurred at the peak load and the average instantaneous losses.
6. ICP: Installation Control Point: An ICP is a unique number that identifies an individual power connection.
7. GXP: Grid Exit Point
8. Utilisation Factor (UF): Utilisation factor is the ratio of the maximum non-coincident kVA demand on the component to the rating of the component.
9. LV: Low Voltage
10. HV: High Voltage
11. TH: Total number of hours in one year (8760).
12. THH: Total number of half hourly recordings in one year.

4. Network Energy Losses

Network Energy losses are categorised mainly in three different categories as following:

4.1 Reconciliation Losses

The Electricity Authority's "*Guidelines on the calculation and the use of loss factors for reconciliation purposes V2.3*" recommends Reconciliation Losses to be calculated from the immediate past 12 months' energy injection and consumption information for an electrically connected network. Hence for this analysis, Top Energy has used the measured Reconciliation Losses over the recent twelve-month period for which all required data is available, 1 September 2023 to 31 August 2024.

These losses are the difference between the energy delivered and the energy sold in the Top Energy Network. In calculating these losses, Top Energy accounts for the energy contributions from Transpower at the Grid Exit Point (KOE), as well as from the Ngawha Geothermal Power Station, which comprises two distinct sections: Ngawha A and Ngawha B. Ngawha A feeds into the sub-transmission level, whereas Ngawha B connects at the transmission level, each influencing the network's losses at different voltages. Moreover, the energy contribution from the Kaitaia Solar Farm (KTS) located in the network's northern region is also factored into the loss calculations.

4.2 Technical Losses

Technical losses represent the electricity that is consumed during the delivery to customers' installations. There are two components of technical losses on a distribution network.

a. Load Losses: These losses depend on the quantity of electricity being supplied through the network. At any given time, these losses are proportional to the square of the current being supplied through the network equipment such as sub-transmission, distribution and LV lines, zone substation and distribution transformers. These losses are also known as copper losses or I^2R losses.

b. No-load Losses: These losses are constant and do not depend on load. These losses arise from the standing or iron losses of the network transformers (both zone substation and distribution transformers).

Losses at peak demand are calculated on the relevant part of the network using Top Energy's DigSILENT PowerFactory load flow package. The associated total energy losses over a twelve-month period were calculated applying an appropriate Load Loss Factor[ii] (LLF) as follows:

$$\text{Load Energy Losses (kWh)} = \text{Load Losses at Peak Demand (kW)} \times \text{TH (hrs)} \times \text{LLF} \quad \textit{(i)}$$

The LLFs for TE's Network and site-specific industrial customers were calculated using 2023-24 actual metered data.

The No-load Losses for substation transformers were obtained from manufacturer's data and test sheets. The associated energy losses are calculated as follows:

$$\text{No-Load Energy Losses (kWh)} = \text{No-Load Losses (kW)} \times \text{TH (hrs)} \quad \textit{(ii)}$$

[ii] Load Loss Factor is explained in detail in Section 5

The LLF was not applied to No-load Losses as these losses are not dependent on transformer loading and do not vary with time. The No-load Losses are multiplied by total hours to calculate the no-load energy losses over the one-year period.

The No-load Losses for distribution transformers were calculated in a similar manner to substation transformers by applying equation ii, using the No-load Losses supplied by the manufacturer. However, as distribution transformers are not modelled in DigSILENT a different approach was used to calculate the distribution transformer load losses.

Manufacturers' data provides the load loss when a transformer is operating at its rated load. The actual distribution transformer peak load losses were assessed by applying a UF, and a LLF was then applied to convert this to annualised energy losses.

Using this data, the annualised load energy losses associated for each type of distribution transformer can be calculated using Equation iii:

Load Energy Losses (kWh) = Load Losses (kW) at Max. Rating x (UF (%)^2) x LLF x TH (hrs)

(iii)

4.3 Low Voltage (LV) Network and Non-Technical Losses

Non-technical Losses are the difference between Reconciliation Losses and Technical Losses for the entire network. These losses include unaccounted energy due to theft, meter inaccuracy and minor billing errors.

Due to the nature of the LV network, its low level of loading and the extensive modelling data that would be required, it is impractical to calculate the LV network's load losses using load flow studies with a high level of accuracy. With such limitations, Top Energy does not separately calculate LV network losses but includes them in its derivation of non-technical losses (which are derived by subtracting high voltage and distribution transformer technical losses from the total measured reconciliation losses). The approach is valid if it is assumed that Non-technical Losses primarily occur at LV level. This applies to the Top Energy network, where only two large consumers are metered at 11kV or above. Hence Non-technical Losses are only allocated to LV network consumers.

LV and Non-technical Energy Losses = Reconciliation Losses – Total Upstream Technical Losses

(iv)

Top Energy has analysed this approach and compared it with what is recommended in the Electricity Authority Guidelines, concluding that the use of the recommended approach would not materially impact the RLFs applied to any ICP.

5. Load Loss Factor

The LLF is the ratio between the average instantaneous losses over a 12-month period, and the instantaneous losses incurred at the peak load during the same period. It is proportional to the square of the load and expressed as:

$$LLF = \sum_{n=1}^{THH} \left(\frac{Load^2_n}{PeakLoad^2}\right)/THH$$

(v)

Where: Load $_n$ = the 30-minute average load in the nth period
THH = the number of 30-minute load recordings in one year
Peak load = the highest 30-minute average load in one year

A single network LLF has been applied uniformly across all parts of the network, excluding distribution transformers. This LLF was calculated using metered data from the past 12 months, incorporating power injected at the Kaikohe Grid Exit Point from the grid, Ngawha power stations, and the Kaitaia Solar Farm. However, a separate LLF was calculated specifically for JNL as a site-specific industrial customer, based on JNL's half-hourly metering data. Additionally, separate LLFs were applied to distribution transformers, as detailed in section 6.6.
A sensitivity test has been undertaken to assess the impact of applying different load factors across a feasible range and found that the most material relative impact on calculated RLFs was under 0.6% and most were under 0.25%. Based on these findings, Top Energy is confident that using a uniform load factor across the entire network, excluding distribution transformers, is an effective approach.

6. RLF Calculation

Figure 1 represents the application of the RLFs at different network stages. This figure does not include the application of any site-specific ICP.

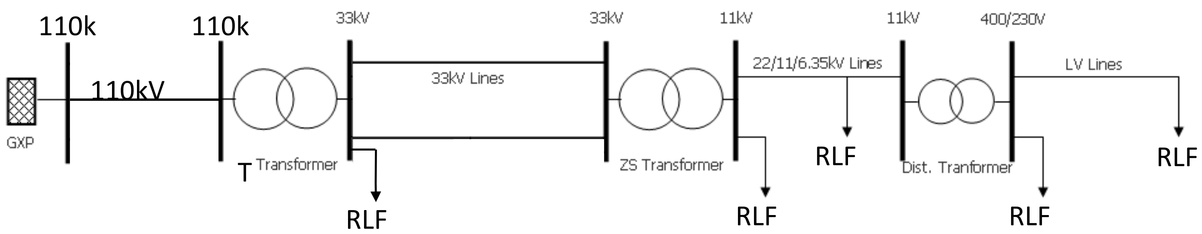

Figure 1: RLF Application at Different Network Stages

6.1 Reconciliation Loss Factor

The Reconciliation Loss Factor for the entire network is calculated using Equation vi

$$\text{RLF R} = 1/\left(1-\left(\frac{\text{Reconciliation Losses (kWh)}}{\Sigma\text{ Energy Injected (kWh) for Entire Network}}\right)\right) \quad (vi)$$

Where Reconciliation Losses are the measured losses on the network over a twelve-month period and the total energy injected is the metered injection over the same period.

As indicated in Figure 1, loss factors can be calculated in a similar way for different network segments where the losses are the calculated losses for that segment and the energy injected refers to the energy injected into a particular segment. Calculation of the losses for each network segment is discussed further below. The energy injected is equal to the energy injected into the entire network, less calculated upstream losses, less energy supplied to customers directly connected at an upstream voltage.

The cumulative RLF at any network voltage level is the product of all upstream RLFs.

6.2 Transmission (110kV)

Transmission losses are distributed evenly among all consumers, including those in the southern region. However, the losses at the Kaikohe transmission substation warrant special attention due to the influence of the Ngawha Power station and its high load factor. When Ngawha A is operational, its output typically feeds directly into the Kaikohe 33kV network, bypassing the Kaikohe 110kV transformers. On the other hand, Ngawha B connects to the 110kV busbar at Kaikohe, so the load and no-load losses on the Kaikohe transformers are considered.

To determine the load losses of the Kaitaia substation and the KOE-KTA 110kV line, load flow analyses were performed for the individual 2023-24 peak periods of the Southern/Eastern and Northern networks. These analyses utilized the network LLF, as outlined in Section 5, and the energy losses were computed using Equation i.

6.3 Sub-transmission Network (33kV line) Losses

Specific load flow studies for the northern and southern 33kV networks were implemented to calculate the Load Losses in 33kV lines at peak demand. The actual 2023-24 peak demand for each 33/11kV substation was used.

The TE network LLF described in section 5 is applied to the Load Losses of the 33kV lines supplied from each transmission substation, thus calculating associated energy losses as per Equation i. In calculating the sub-transmission RLF an adjustment was made to remove the losses attributed to JNL in the calculation of JNL's site specific loss factor.

6.4 Zone Substation Losses

Zone substation models are developed, and load flow studies were carried out using the 2023-24 peak demand for each 11kV distribution feeder to obtain the Load Losses at peak demand.

The TE network LLF described in section 5 is applied to zone substation Load Losses to calculate associated energy losses.

The No-load Losses for all zone substation transformers are obtained from manufacturer's data sheets. Energy losses associated with No-load Losses of the zone substation transformers are calculated as per Equation ii.

6.5 HV Network (22/11/6.35 kV Line) Losses

Top Energy's HV Network, modelled using GIS data, includes detailed feeder backbone models starting from the 11kV bus at each zone substation and encompasses 2-wire and SWER lines with isolating transformers. For simplicity, all spur lines less than 500m are excluded and modelled as lump loads on the HV feeder backbone. Load flow studies, based on 2012 peak demand data, have been used to obtain Load Losses.

All distribution data is currently being updated into DigSILENT PowerFactory. This process is not yet finalized. Calculation have shown to be sufficiently accurate when comparing metered versus calculated (using the loss factors) energy injection into the network.

6.6 Distribution Transformer Losses

The rated Load and No-load Losses incurred in distribution transformers were obtained from Manufacturers' data sheets. Average losses are calculated for transformers including SWER isolating transformers categorized by type and size.

The number of transformers of each size is obtained from Top Energy's GIS database as disclosed in Top Energy's Asset Management Plan.

The Utilisation factors (UF) and LLFs used to calculate transformer load losses are based on the factors recommended in the *Guidelines on the calculation and use of loss factors v2.3*. The energy losses for the Load and No-load Losses are calculated using formula iii.

6.7 Low Voltage Network Losses

The RLF at LV Network level is calculated using energy losses obtained as per sub-section 4.3.

6.8 Embedded Generator Losses

The Guidelines requires embedded generators of 10MW or more to calculate a site specific RLF. Where the embedded generation reduces network losses, the RLF will be greater than 1.00. Conversely, where the embedded generation increases network losses, the RLF will be less than 1.00.

There are two methodologies that may be used to calculate site specific technical losses for ICCs (Individually calculated customers): the pro-rated and incremental methodologies. When the generator is large in relation to other loads in the network, the embedded generator is required to undertake a loss calculation based on incremental effects.

Top Energy calculates site-specific RLFs for four embedded generators: Ngawha A [25MW], Ngawha B [31MW], the Kaitaia Solar Farm [23MW], and the Pukenui Solar Farm [17.16MW]. These generators are considered large compared to the load connected to the nearby network, and therefore, the incremental impact methodology is used to ensure accuracy and compliance with the Electricity Authority Guidelines.

6.8.1 Overview of Calculation

Network losses are known to be dependent on the size of both background network load and generation. To accommodate this variability, Top Energy modelled a scenario matrix (Table 1) that considers low, medium, and high values for both generation and load under two conditions: one where the site-specific generator is turned off while all other embedded generators remain on, and another where all embedded generators, including the site-specific generator, are operational.

Table 1 - Whole Network Losses in Each Scenario (MW)

	Site specific generator - Off			**Site specific generator - On**		
	P15 Gen	P60 Gen	P95 Gen	P15 Gen	P60 Gen	P95 Gen
P15 Load						
P60 Load						
P95 Load						

'Low', 'medium', and 'high' are defined by percentile values for both network load and generation. These are consistent with the example discussed in the Guidelines. Specifically, the percentile values used for both generation and network load are P15, P60, and P95. Table 2 summarises the power outputs for the four embedded generators used in this calculation.

Table 2 – Embedded Generators Output (MW)

	Ngawha A	**Ngawha B**	**Kaitaia Solar Farm**	**Pukenui Solar Farm**
P15	21.83	29.49	0	0
P60	23.60	30.16	3.5	2.7
P95	24.83	32.67	23	17.16

In relation to the network load, the three scenarios selected are P15 (15th percentile, representing the lower range of demand from P0 to P30), P60 (60th percentile, representing the mid-range of demand from P30 to P90), and P95 (95th percentile, representing the upper range of demand from P90 to P100).

The correlation between network load and generation is an important consideration for the time-weighted totals methodology. For Ngawha A and Ngawha B, we have computed a correlation matrix using half-hour SCADA data for generation and network demand, as it is reasonable to assume that both plants have the same correlation with load due to their stable generation profiles throughout the day. For the solar farms, since we do not yet have a full year of generation data for either Kaitaia Solar Farm or Pukenui Solar Farm, we have used the loss factor report for Kaitaia Solar Farm prepared by Lodestone and reviewed by Ergo as a reference.

The correlation matrix illustrating the relationship between generation and network load is expected to have the same fields as Table 2, with each element representing the expected number of "half-hours" per year that each scenario is valid.

The network Powerfactory model needs to be run 18 times: nine scenarios where the site-specific generator is turned off while all other embedded generators remain operational, and nine scenarios where all embedded generators, including the site-specific generator, are operational.

Each element in Table 1 is the whole network losses for that particular generation and load scenarios. Total losses with and without generation are calculated by multiplying Table 1 by the expected number of half-hours per year for each scenario (correlation matrix). The loss is calculated for each of the 'no generation' and 'with generation' scenarios by totalling each of the columns.

$$Sum\ of\ network\ loss\ with\ generation = \sum P15, P60, P95\ scenario\ sums$$

The network loss due to generation can be calculated by the formula below

$$\begin{aligned} &Network\ loss\ due\ to\ generation \\ &\qquad = Sum\ of\ network\ loss\ with\ generation \\ &\qquad - Sum\ of\ network\ loss\ without\ generation \end{aligned}$$

The annual generator output can be calculated by using the time-weighted approach. Table 3 provides an example of this calculation structure.

Table 3 - Annual Generator Output (MWh)

	Generation Scenario			
	P15 Gen	P60 Gen	P95 Gen	
Generation (MW)				
HHs of Generation				**Annual Generator Output (MWh)**
Generation (MWh)				

The technical loss factor (TLF) is calculated by the following formula

$$TLF = 1 + \frac{Network\ loss\ due\ to\ generation\ (MWh)}{Annual\ generator\ output\ (MWh)}$$

The technical loss ratio (TLR) is the ratio of TL attributed to a Point of Connection (POC), to the sum of the volume measured at that POC and the attributed TL.

$$TLR = \frac{Network\ loss\ due\ to\ generation\ (MWh)}{Annual\ generator\ output\ (MWh)\ x\ 1 + Network\ loss\ due\ to\ generation\ (MWh)}$$

6.9 Background information

The following is a summary of the input data that forms the basis for the RLF calculation.

Table 4 - Key Input data for embedded generation loss factor calculation.

No	Document	Description
1	NGA_Loss_Factors-2024_Correlation Group.xlsx	Ngawha A loss factor calculation based on incremental impact
2	NGB_Loss_Factors-2024_Correlation Group.xlsx	Ngawha B loss factor calculation based on incremental impact
3	KTS_Loss_Factors-2024_Correlation Group.xlsx	Kaitaia Solar Farm loss factor calculation based on incremental impact
4	PSF_Loss_Factors-2024_Correlation Group.xlsx	Pukenui Solar Farm loss factor calculation based on incremental impact
5	Lodestone Kaitaia - Loss Factor Report_Final v2.pdf	Lodestone loss factor report
6	2024-KTS_PSF-Loss Factor-Correlation.pfd	DigSilent Powerfactory model
7	TE_Network_halfhour_data.xlsx	Top Energy half hourly data: GXP, Generation and Network Demand

Table 5 - Key Input data for RLFs calculation for each network segment and JNL.

No	Document	Description
1	LLF_RLF_Calculation and Summary_FY25-Final.xlsx	Master spreadsheet with the output data from the load flow calculations in PowerFactory, along with LLF and RLF calculations for each network segment (Figure 1)
2	TE_Sales_Volume-FY24.xlsx	Top Energy sales volume data up to September 2024
3	TE_Network_halfhour_data.xlsx	Transmission LLF calculation
4	LLF_Site_Specific_JNL-FY24.xlsx	JNL LLF calculation
5	DLF Distribution Network_2024.xlsx	HV Network (22/11/6.35kV) line losses calculation
6	DLF Distribution Txfrs_2024.xlsx	Distribution transformer losses calculation
7	2024-KTS_PSF-Loss Factor-Correlation.pfd	DigSilent Powerfactory model

7. Site Specific Loads

A site-specific loss factor has been calculated for the JNL mill near Kaitaia because of the relative size of the load and its high LLF. This has been determined as follows:

RLF_A was the same for JNL as for all other consumers, consistent with Top Energy's decision to allocate transmission losses across all consumers based on total consumption.

Using load flow analysis, technical losses on the sub-transmission network at peak load were determined for each network segment used to supply power to the mill. These are the 33kV lines between Kaitaia and the mill and the JNL zone substation transformers. The peak losses on each segment attributable to the mill have been estimated by pro-rating these losses based on the ratio of mill load to the total load on the segment. Annualised losses at each network level attributable to the mill are calculated using the mill's actual LLF.

No load losses on the NPL zone substation transformers have also been attributed to the mill by pro-rating annual no-load losses on each transformer by the ratio of the peak load attributable to the mill and the peak transformer load.

The sub-transmission RLF for the mill was then calculated using the equation i. This was multiplied by RFL_A to obtain the site specific RLF for JNL; this ensured the transmission losses are included.

The sub-transmission losses attributable to the mill are subtracted from the calculated technical losses of each sub-transmission network segment before calculating the sub-transmission network loss factor to avoid double counting.

8. Compliance Requirement

Once RLFs are calculated and applied to appropriate voltage level, the distributor must submit to the Electricity Authority its proposed loss factors for the next financial year, prior to 1 April of each year regardless of whether there is any change from the previous financial year. Moreover, a report detailing loss factor calculation methodology and the detailed RLF / Reconciliation Losses for each voltage level shall be prepared for the submission to the Electricity Authority as per the requirement specified in the Electricity Authority's Guideline [l].

Top Energy intends to recalculate the Loss Factors next year due to changes in the network configuration.

9. Network Loss Factor Summary

This section summaries the loss calculation methodology and the RLF for each stage of the network. Table 6 is the summary of the method applied to calculate losses.

Table 6 - Loss Calculation for Each Stage of the Network

Loss Type	Losses Applied to	Load Losses	No-Load Losses
Reconciliation Losses	Entire Network	Total Network Injection - Total Network Consumption	
Technical Losses	Transmission (110kV)	Using DigSilent PowerFactory Simulation	Using Manufacturer's Data sheet and Test sheets
	Sub-Transmission Network (33kV Lines)		N/A
	Zone Substation		Using Manufacturer's Data sheet and Test sheets
	HV Network (22/11/6.35kV Lines)		N/A
	Distribution Transformers	Using Transformer count, % Utilisation Factor, Manufacturer's Data sheets, Appendix C of Draft Guidelines 2013	Using Manufacturer's Data sheet and Test sheets
LV and Non-Technical Losses	LV Network	Reconciliation Losses – Total Upstream technical losses.	

Table 7 - RLF for Each Stage of the Network and Site-Specific Customers – Financial Year 2024/25

Loss Type	Loss Factor Code	Applied to Customer Connected to	Individual RLF	Cumulative RLF
Reconciliation Losses	RLF R	Entire Network (Reconciliation)	N/A	1.1216
Technical Losses	RLF A	Transmission Network (110kV)	1.0074	1.0074
	RLF B	Sub-Transmission Network (33kV Lines, Zone Substation)	1.0229	1.0305
	RLF C.1	HV Network (22/11/6.35kV Lines)	1.0235	1.0547
	RLF C.2	Distribution Transformers	1.0155	1.0710
Non-Technical Losses	RLF D	LV Network (Non-Technical + LV)**	1.0600	1.1267
Site-Specific Load	RLF I1	JNL	1.0162	N/A
	RLF 12	AFFCO (Cumulative Sub-Trans)	1.0305	N/A
Site-Specific Generation	RLF G1	Ngawha Generation A	0.9966	N/A
	RLF G2	Ngawha Generation B	0.9939	N/A
	RLF G3	Kaitaia Solar Farm	1.0163	N/A
	RLF G4	Pukenui Solar Farm*	0.9076	N/A

*The Pukenui Solar Farms loss factors has been calculated and populated within this methodology document in anticipation of the site being commissioned within calendar year 2025.
** To ensure consistency and minimise fluctuations, two-yearly data of energy injection and sales was used in the calculation of the Low Voltage loss factor.

Table 8 - Summary of overall losses on the TE Network

	ACTUAL	CURRENT	Less IND	NETWORK	BUDGET
kWh	24 Month to Sep24	12 mths to Sep 24	12 mnths	12 mths to Sep 24	12 mths to Sep 24
Total Energy Injected into Network	738,535,577.19	366,778,057.81	39,947,069.12	326,830,988.69	374,332,564.66
Total Energy Sold to Customers	662,595,552.29	327,854,131.22	39,179,005.19	288,675,126.03	338,181,014.23
Total Losses (kWh)	75,940,024.90	38,923,926.59	768,063.93	38,155,862.66	36,151,550.42
Loss percentage	10.28%	10.61%	1.92%	11.67%	9.66%
TLF for Entire Network (Reconciliation) Including ICC	1.1146	1.1187	1.0196	1.1322	1.1069

APPROVALS

REVIEWED BY:	Nishan Sooknandan Planning Manager 	Date: 30/01/2025
APPROVED BY:	Claire Picking General Manager 	Date 31/01/2025

Version History

VERSION	APPROVED BY	DATE
1.0	General Manager	Jan/2013
2.0	General Manager	Jan/2018
3.0	General Manager	Jan/2024
4.0	General Manager	Jan/2025

Version Change Table

VERSION	PAGE	CHANGED BY	DESCRIPTION OF CHANGE
3.0	All	Carlo P	PowerFactory Model Updated; Recalculation of Loss Factors Completed; Kaitaia Solar Farm and Pukenui Solar Farm Included. Revision of Ngawha A and B loss factor calculation.