

Distribution Loss Factors

2025 – 2026 Financial Year
Final Report (Public Report)

February 2025

Asset Planning & Performance



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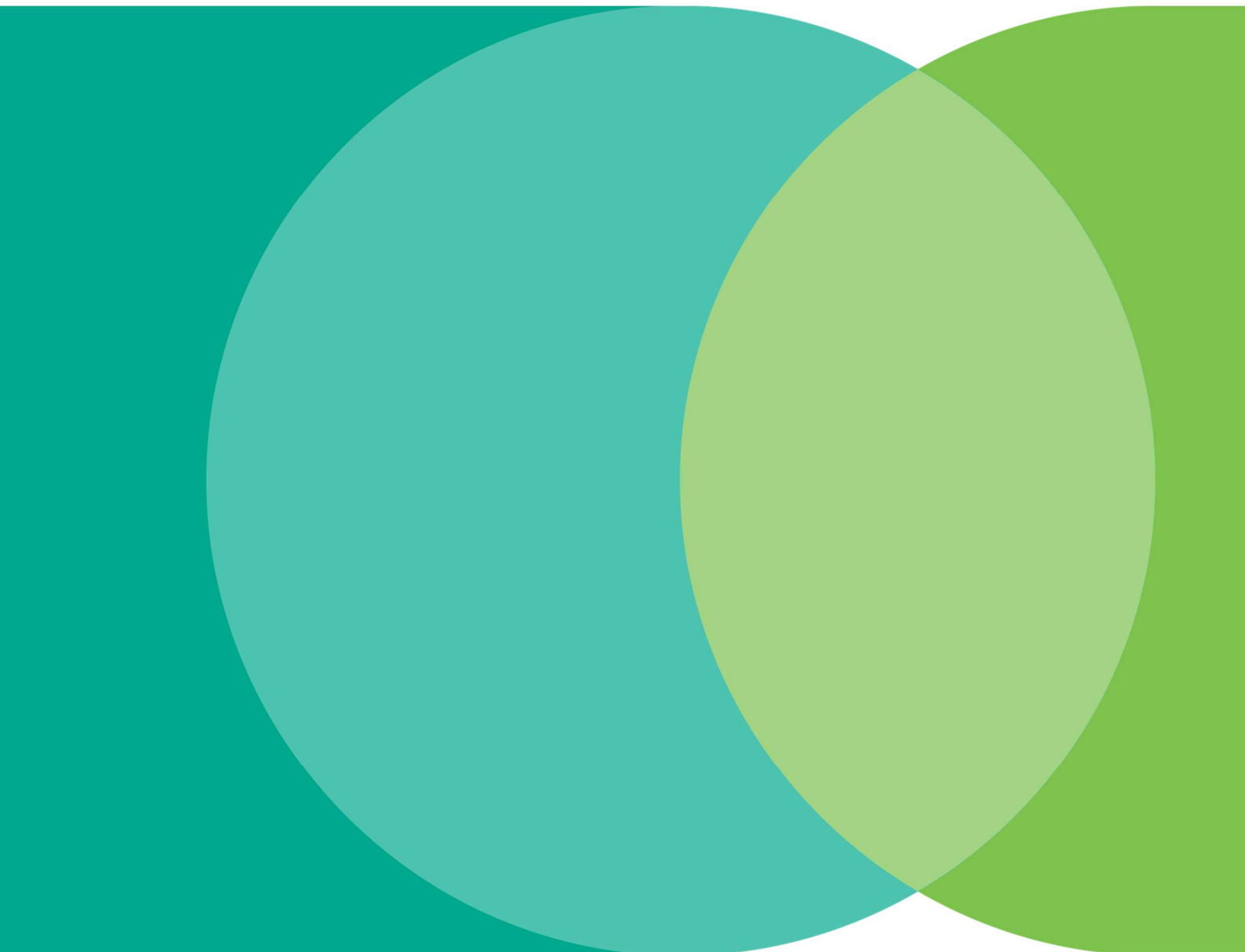
Introduction

The National Electricity Rules require that Distribution Network Service Providers (DNSPs) obtain the approval of the Australian Energy Regulator (AER) as the regulator for distribution loss factors (DLFs) for the Endeavour Energy network. This report nominates the DLFs for Endeavour Energy's electrical distribution network for the 2025/26 financial year.

The methodology used in this calculation are described in Endeavour Energy's publication *Methodology Report Determination of Distribution Loss Factors* dated 3 February 2023 (the Report). The AER requires that distribution loss factors should be calculated for site-specific major customers, while loss factors for each tier of the network should be provided to calculate the losses attributable to the remainder of the customers.

As required by the Report, the proposed DLFs are "forward-looking" and use both demand and energy forecast data as provided by Endeavour Energy's Forecasting & Planning, and Finance sections for the 2025/26 fiscal year. References in this document to 'last financial year' refer to 2023/24 and references to 'next financial year' refer to 2025/26.

Results & Commentary



Tariff customers

Table 1 – Distribution loss factors for tariff customers

Network level ^{1,3}	2024/25		2025/26		Effective section loss factor changes	Cumulative loss factor changes
	Effective section loss factor	Cumulative loss factor ²	Effective section loss factor	Cumulative loss factor ²		
132 kV network	1.0028	1.0028	1.0022	1.0022	-0.06%	-0.06%
Transmission substation	1.0030	1.0076	1.0030	1.0063	0.01%	-0.13%
Sub-transmission network	1.0049	1.0121	1.0040	1.0099	-0.09%	-0.22%
Zone substation	1.0044	1.0114	1.0048	1.0109	0.04%	-0.05%
HV distribution network	1.0048	1.0164	1.0056	1.0167	0.07%	0.03%
Distribution substation	1.0297	1.0479	1.0383	1.0577	0.83%	0.94%
LV distribution network	1.0112	1.0624	1.0193	1.0728	0.80%	0.99%

Notes

1. All loss factors quoted in the above table are given as 1 + the % loss of energy delivered at that level of the network, whether to customers at that level, or to lower levels.
2. In this study section loss factors do not add numerically to give cumulative loss factors because of compounding and network configuration.
3. An allowance for theft losses of 0.5% of total sales has been made.

An examination of the results indicates that the proposed cumulative 2025/26 DLF differ slightly from results obtained in previous years, with significant changes at the distribution substation and LV distribution network levels. Endeavour provides the following commentary regarding the changes in effective section loss factor changes:

- Reduced losses from the 132kV network through to Sub-transmission network (inclusive) could be driven by a significant shift in supply to the network, with a reduction of incoming energy via Bulk Supply Points (Transgrid) and an increase of solar generation in the LV network.
- The significant increase in Distribution Substation and LV network losses could also be attributed to the aforementioned increase in LV network solar generation.

The calculation of the above loss factors is set out in Appendix A. The billed energy data used as the basis of the Report is contained in Appendix B.

Site-specific customers

In accordance with the National Electricity Rules, all customers with an average energy consumption of greater than 40 GWh and/or 10 MW demand have had site-specific loss factors calculated. Embedded generators with a peak output of greater than 10 MW have also had loss factors calculated.

██████████ now qualifies for a site-specific DLF due to meeting the consumption threshold.

██████████ no longer qualifies for a site-specific DLF due to dropping below both thresholds.

Due to the large volume of data produced from the load flow calculations, the derivation of these values is not provided in this report. However, the calculations are available for examination, should this be required. The results are summarised in the following tables:

Table 2 – Location specific loss factors for customers with consumption greater than 40 GWh p.a. and/or a maximum demand greater than 10 MW

Site-specific customers	NMI/s	2024/25 loss factor	2025/26 loss factor	Change	Comments on change
██████████	NEEE000005	1.0136	1.0086	-0.50%	
██████████	NEEE000506	1.0133	1.0126	-0.06%	
██████████	4311028297 4311028276 4311246110 4311246109	1.0149	1.0096	-0.53%	
██████████	NEEE001656	1.0040	1.0024	-0.16%	
██████████	NEEE004639	1.0116	1.0067	-0.48%	
██████████	NEEE000881	1.0072	1.0203	1.30%	██████████
██████████	NEEE001892 4319900786	1.0147	1.0210	0.62%	██████████
██████████	NEEE000014	1.0081	1.0175	0.93%	██████████
██████████	NEEE001591	1.0099	1.0221	1.20%	██████████
██████████	NEEE000003	1.0104	1.0001	-1.02%	
██████████	NEEE000049	1.0152	1.0056	-0.95%	██████████

Site-specific customers	NMI/s	2024/25 loss factor	2025/26 loss factor	Change	Comments on change
[REDACTED]	4310857952	1.0194	1.0115	-0.78%	[REDACTED]
[REDACTED]	4310866743	1.0087	1.0000	-0.86%	[REDACTED]
[REDACTED]	4310928612 4310928665	1.0164	1.0085	-0.78%	
[REDACTED]	4311206443	1.0051	1.0034	-0.17%	[REDACTED]
[REDACTED]	4310942441	1.0062	1.0002	-0.60%	
[REDACTED]	NEEE005219	1.0078	1.0074	-0.04%	
[REDACTED]	4311371172 4311371951	1.0000	1.0000	0.00%	
[REDACTED]	4311139903	1.0186	1.0216	0.29%	
[REDACTED]	4311159207	1.0058	1.0060	0.01%	
[REDACTED]	4311168207	1.0043	1.0067	0.24%	
[REDACTED]	4311173727	1.0051	1.0037	-0.14%	[REDACTED]
[REDACTED]	4311340412 4311204594 4311204547	1.0094	1.0076	-0.19%	[REDACTED]
[REDACTED]	4311271253 4311271260	1.0015	1.0013	-0.02%	
[REDACTED]	4311322991 4311322992	1.0078	1.0060	-0.18%	
[REDACTED]	4311251697 4311297310	1.0022	1.0005	-0.17%	

Site-specific customers	NMI/s	2024/25 loss factor	2025/26 loss factor	Change	Comments on change
[REDACTED]	4311275493	1.0092	1.0010	-0.81%	[REDACTED]
[REDACTED]	4311339343 4311339344 4311339345	1.0094	1.0076	-0.18%	[REDACTED]
[REDACTED]	NEEE000762 NEEE000764 NEEE000766 NEEE000768 NEEE000760	1.0175	1.0089	-0.85%	
[REDACTED]	NEEE000066	1.0325	1.0295	-0.29%	
[REDACTED]	NEEE000046	1.0040	1.0029	-0.11%	
[REDACTED]	4311061116 4311061119	1.0064	1.0052	-0.12%	
[REDACTED]	NEEE000006	1.0321	1.0288	-0.32%	
[REDACTED]	NEEEW04150 NEEEW04151 NEEEW04152 NEEEW04153 NEEEW04154	1.0090	1.0065	-0.25%	
[REDACTED]	NEEEW00001 NEEEW00002	1.0033	1.0030	-0.03%	
[REDACTED]	NEEEW04511 NEEEW04512	1.0037	1.0044	-0.07%	[REDACTED]
[REDACTED]	NEEE000758	1.0105	1.0041	-0.63%	[REDACTED]

Site-specific customers	NMI/s	2024/25 loss factor	2025/26 loss factor	Change	Comments on change
[REDACTED]	NEEE000759	1.0105	1.0255	1.48%	[REDACTED]

Note:

* - Customer did not qualify for a site specific DLF and a generic DLF was applied

Site-specific embedded generators

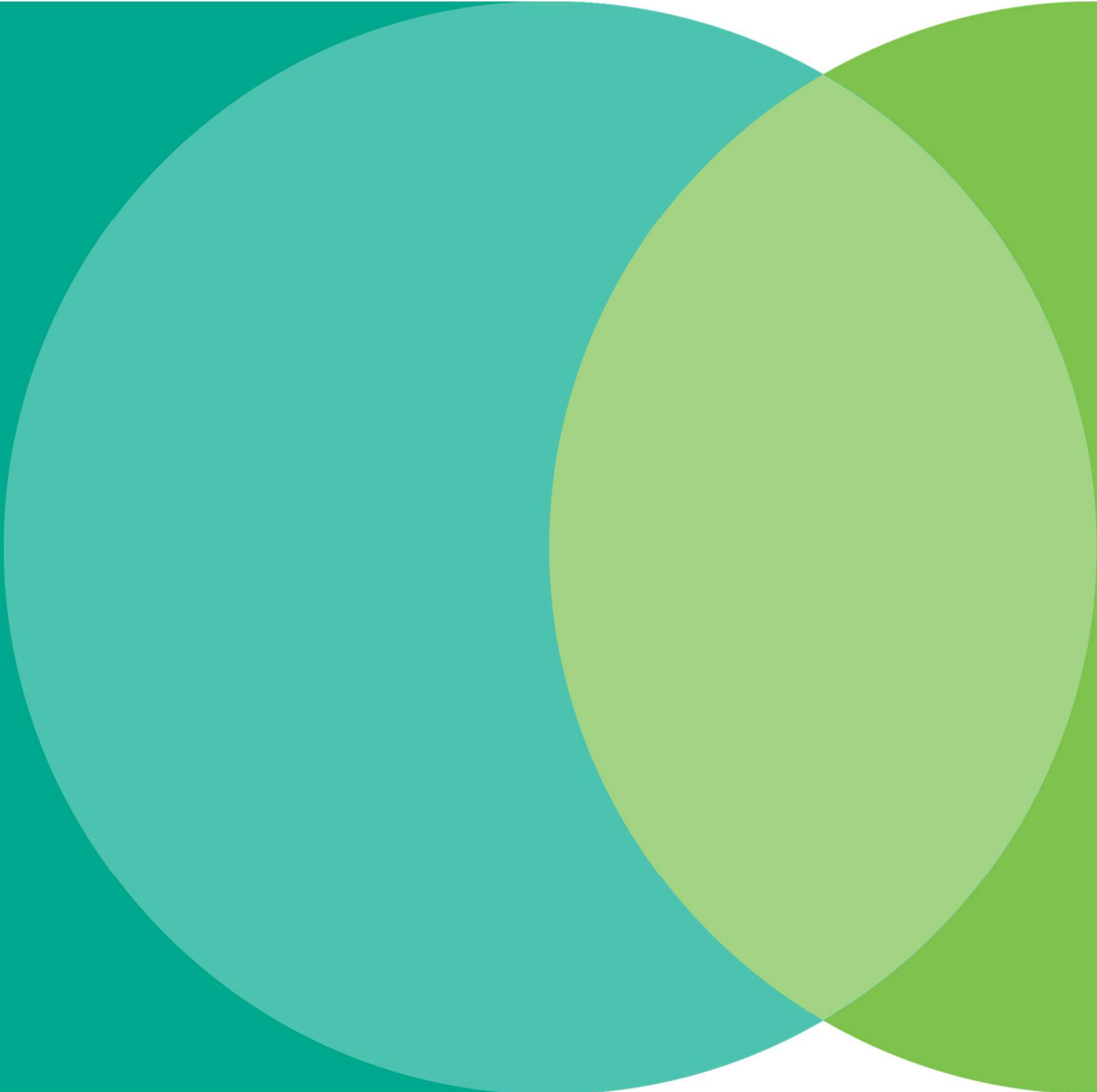
The DLFs for the major embedded generators are as shown below. The methodology for the calculation of these DLFs is based on the difference in losses in the network between the conditions where the generator is operating and not operating over an annual cycle, relative to the energy sent out by the generator over the same period.

The applicable DLFs for embedded generators can have either positive or negative benefits depending on the level of generation and how much of the local generation is consumed locally. When the local generation is consumed locally, overall losses are reduced. However, overall losses incurred in the network increase if the local generation exceeds local load for significant periods during the year. Note that for generators, a DLF less than 1.000 corresponds to an increase in losses when the generators are connected to the network.

Table 3 – Location specific loss factors for embedded generators with peak generation greater than 10 MW

Site-specific embedded generators	NMI/s	2024/25 loss factor	2025/26 loss factor	Change	Comments on change
[REDACTED]	NEEE000748	0.9957	0.9748	-2.10%	[REDACTED]
[REDACTED]	NEEE000749	1.0217	0.9972	-2.39%	[REDACTED]
[REDACTED]	NEEE000750	1.0145	1.0028	-1.15%	[REDACTED]
[REDACTED]	4310951391	0.9996	1.0000	0.04%	[REDACTED]
[REDACTED]	4311422627	0.9980	1.0000	0.20%	[REDACTED]

Reconciliation of forecast and actual losses



As required by the Rules, a reconciliation of forecast and actual losses has been carried out. This involved taking the complete billing data set for the last financial year and comparing the losses incurred with those estimated by the calculations carried out previously for that year. A summary comparison between the actual losses as calculated from the billing data and the losses predicted by calculation at the macro level is shown in Table 4 below. A reconciliation using the proposed DLFs for the relevant year are shown in Table 5.

Details of this calculation for the 2023/24 financial year are contained in Appendix B.

Table 4 – Reconciliation of forecast to actual losses at macro level

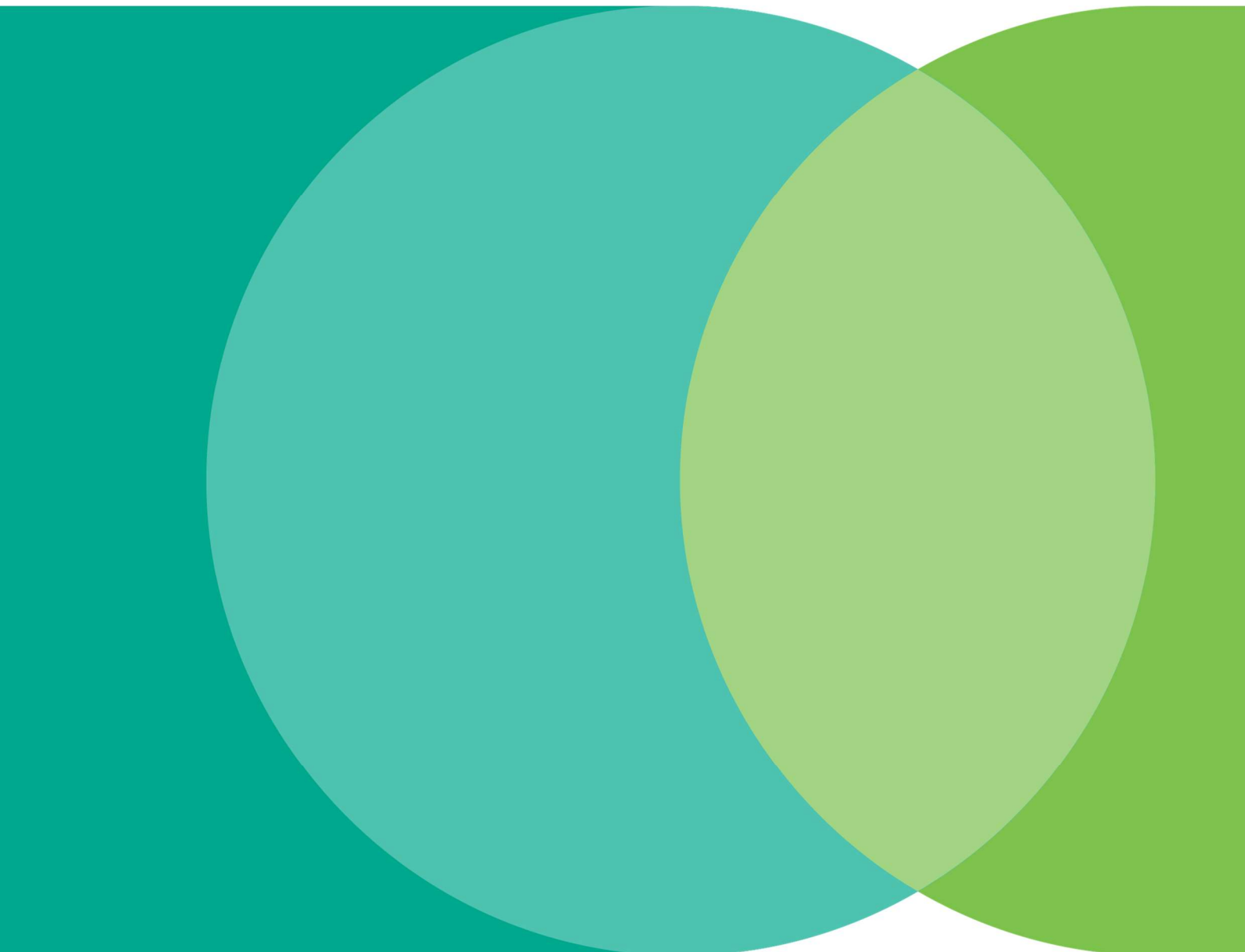
Financial year	Forecast loss (kWh)	Actual loss (kWh)	Difference (kWh)	Energy distributed (kWh)	Forecast error as % of energy distributed
2014/15	620,376,428	672,024,439	-51,648,011	16,127,500,731	-0.32%
2015/16	644,002,105	693,554,014	-49,551,909	16,645,596,945	-0.30%
2016/17	672,024,439	673,002,628	-978,189	16,739,660,930	-0.01%
2017/18	693,554,014	784,053,584	-90,499,570	16,639,359,421	-0.54%
2018/19	673,002,628	783,907,002	-110,904,374	16,758,896,351	-0.66%
2019/20	715,801,176	750,188,080	-34,386,904	16,511,359,434	-0.21%
2020/21	783,907,002	735,934,929	47,972,073	16,716,870,093	0.29%
2021/22	750,188,080	735,905,423	14,282,657	16,711,340,936	0.09%
2022/23	735,934,929	739,782,428	-3,847,500	16,883,000,000	-0.02%
2023/24	739,782,428	812,672,769	-72,890,341	18,305,717,444	-0.40%

Table 5 – Reconciliation of forecast to actual losses using DLF for that year

Financial year	Forecast loss (kWh)	Actual loss (kWh)	Difference (kWh)	Energy distributed (kWh)	Forecast error as % of energy distributed
2016/17	811,986,066	673,002,628	138,983,438	16,739,660,930	0.83%
2017/18	786,334,666	784,053,584	2,281,082	16,639,359,421	0.01%
2018/19	783,544,563	783,907,002	-362,439	16,758,896,351	0.00%
2019/20	765,491,446	750,188,080	15,303,366	16,511,359,434	0.09%
2020/21	853,091,551	735,934,929	117,156,622	16,716,870,093	0.70%
2021/22	795,245,393	735,905,423	59,339,970	16,711,340,936	0.36%
2022/23	811,613,082	739,782,428	71,830,654	16,883,000,000	0.43%
2023/24	897,055,880	812,672,769	84,383,111	18,305,717,444	0.46%

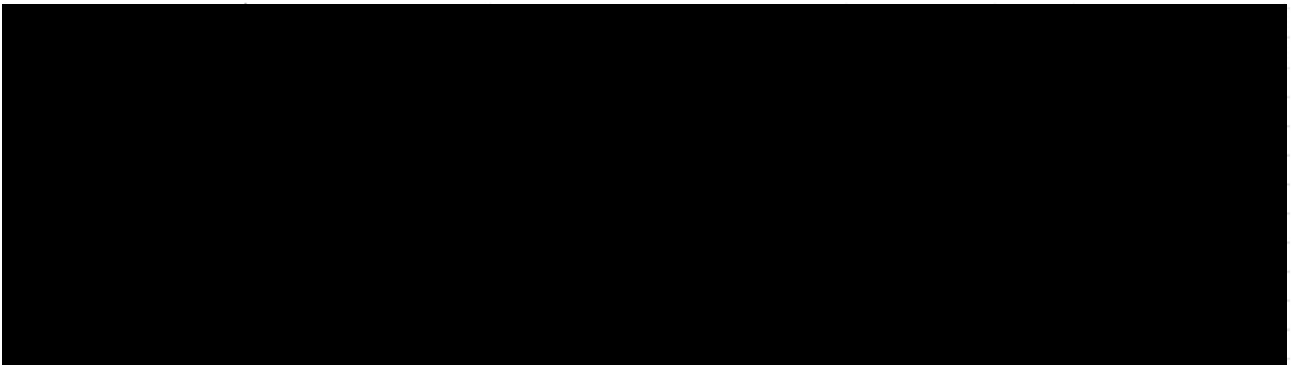
Note that the 2023/24 financial year is the last complete set of available billing data.

Appendices



Appendix B – Billed energy data for 2023/24 financial year

2023/24 Data	
Energy Imports	
Summary - Energy Imports	kWh
TransGrid - All BSP	15,746,185,862
Embedded Generators	3,372,204,350
Sunpower - included in "Embedded Generators" Total	-
Total Imports kWh	19,118,390,213
Embedded Generators breakdown	
	kWh
Landfill Gas	55,423,028
Non-Renewable	945,064,463
Renewable - PV, Hydro & Wind	2,371,716,859
Decommissioned	0
Total Embedded Generation	3,372,204,350
Energy Exports	
Consumption Data based on WAPC	kWh
Total Board Report	18,305,717,444
Dom & CLd	6,094,299,852
Domestic	5,211,645,427
Controlled Load	748,881,091
NSW Solar Bonus Scheme	133,773,335
Commercial	1,983,630,676
General Supply Non TOU	1,832,786,764
General Supply TOU	48,142,376
Unmetered -	102,701,536
Industrial	10,227,786,916
Low Voltage TOU Demand	4,022,958,921
High Voltage TOU Demand	1,813,588,342
Subtransmission TOU Demand	2,830,062,092
Bulk & Inter-distributor Transfer	1,561,177,561



[Redacted content]					

CLASS	CATEGORY	Summary		
		ALL KWH	SITE SPECIFIC KWH	GENERAL KWH
Total of all LV customers (excluding site specifics)		12,100,889,449		Calculated
Total of all HV customers (excluding site specifics)		1,366,907,926		Calculated
Total of all ST Customers (excluding site specifics)		77,811,294		Calculated
Total energy consumption of all site specifics in current year		4,760,108,775		Calculated
Cross Check Total Consumption		18,305,717,444		Calculated
Difference		0		Calculated
Unallocated 132kV customers (energy) kWh		446,877	All sites have time series data	Calculated
Unallocated 33kv and 66kV customers (energy) kWh		77,364,417	All sites have time series data	Calculated
ST Customers (excluding site specifics)				Calculated
HV Customers Connected Directly to Zone Sub HHVT		144,796,422		Calculated
HV Customers Connected into HV network HHVL		1,222,111,505		Calculated
LV Customers connected directly to Distribution Sub HLVL		1,481,327,031		Calculated
LV Customers connected into the LV network HLVL * excluding site specifics		10,516,860,883		Calculated
Unmetered LV Supplies		102,701,536		Calculated
Site Specifics from above		4,760,108,775		Calculated
Cross Check total Consumption		18,305,717,444		Calculated
Difference		0		Calculated
Total Energy in		19,118,390,213		Calculated
Total Billed Energy		18,305,717,444		Calculated
Actual Losses (last Financial Year)		812,672,769		Calculated
Overall losses as a function of Energy Imports		4.25%		Calculated
Overall losses as a function of Energy Sales		4.44%		Calculated
Allowance for Theft (0.5% of total sales)		91,528,587		Calculated
Theft as a % of low voltage sales (\$4.3 of report)		0.76%		Calculated
General Customers Billed (Total Billed less Site Specific Customers)		13,545,608,669		Calculated
Energy in incl Generation		19,118,390,213		Calculated
Site Specifics		4,760,108,775		Calculated
Overall Losses Energy In less General Customers Billed + Energy in incl Generation		812,672,769	Check=> 812,672,769	Calculated
Overall Loss factor as a function of Billed Energy		4.44%		Calculated
Forecast Losses for 2025/26 (From that year's DLF report)		739,782,428	Main spreadsheet -> Reconciliation -> Total losses incl. SS & theft	
Loss Difference		-72,890,341		Calculated
Error as % of Energy Distributed		-0.40%		Calculated

DLF HISTORICAL RECONCILIATION				
2023/24				
Site Specific Customers:	NMI List	Actual Sales (GWh)	Previous DLF	DLF * Sales (GWh)
	NEEE000005		1.0136	
	NEEE000506		1.0133	
	4311028297			
	4311028276			
	4311246110		1.0149	
	4311246109			
	NEEE001656		1.0040	
	NEEE004639		1.0116	
	NEEE000881		1.0072	
	NEEE001892			
	4319900786		1.0147	
	NEEE000014		1.0081	
	NEEE001591		1.0099	
	NEEE000003		1.0104	
	NEEE000049		1.0152	
	4310857952		1.0194	
	4310866743		1.0087	
	4310928612			
	4310928665		1.0164	
	4311206443		1.0051	
	4310942441		1.0062	
	NEEE005219		1.0078	
	4311371172			
	4311371951		1.0000	
	4311139903		1.0186	
	4311159207		1.0058	
	4311168207		1.0043	
	4311173727		1.0051	
	4311340412			
	4311204594		1.0094	
	4311204547			
	4311271253			
	4311271260		1.0015	
	4311322991			
	4311322992		1.0078	
	4311251697			
	4311297310		1.0022	
	4311275493		1.0092	
	4311339343			
	4311339344		1.0094	
	4311339345			
	NEEE000762			
	NEEE000764			
	NEEE000766		1.0175	
	NEEE000768			
	NEEE000760			
	NEEE000066		1.0325	
	NEEE000046		1.0040	
	4311061116		1.0064	
	4311061119			
	NEEE000006		1.0321	
	NEEEW04150			
	NEEEW04151			
	NEEEW04152		1.0090	
	NEEEW04153			
	NEEEW04154			
	NEEEW00001		1.0033	
	NEEEW00002			
	NEEEW04511		1.0037	
	NEEEW04512			
	NEEE000758		1.0105	
	NEEE000759		1.0105	
Site Specific Totals	Actual Sales (GWh)	4,760.1	DLF * Sales (GWh)	4,814.6

Formulas should add HVCs that are SS in current DLF study that were not in study to be reconciled
 Formulas should subtract HVCs that are not SS in current DLF study that were in study to be reconciled

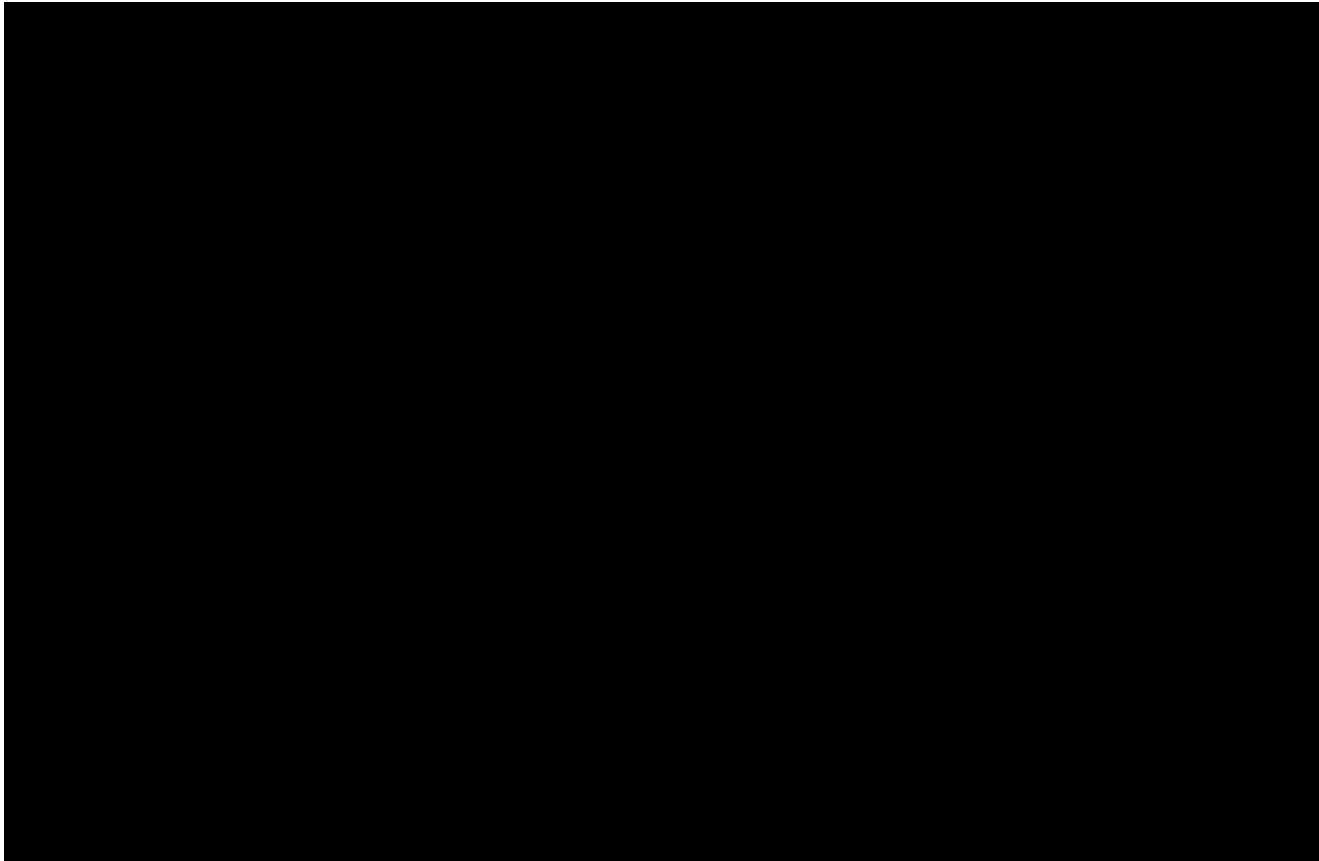
General Loads	Study FY - 2		
	Actual Sales (GWh)	Previous DLF	DLF * Sales (GWh)
132 kV Network	0.4	1.0025	0.4
Transmission Substation	0.0	1.0072	0.0
Subtransmission Network	127.2	1.0116	128.7
Zone Substation	144.8	1.0118	146.5
High Voltage Distribution Network	1,184.6	1.0162	1,203.8
Distribution Substation	1,481.3	1.0502	1,555.7
Low Voltage Distribution Network	10,516.9	1.0691	11,243.2
Unmetered	102.7	1.0691	109.8
General Load Totals			
Actual Sales (GWh)	13,557.9	DLF * Sales (GWh)	14,388.2
	GWh		Totals
Actual Purchases	19,118.4		19,202.8
Billed Sales	18,305.7		18,318.0
Actual Losses	812.7		
Reconciled Purchases	19,202.8		
Reconciled Losses	897.1		
Loss Error	84.4		
Error as a % of Actual Purchases	0.44%		
Error as a % of Actual Sales	0.46%		
Error as a % of Losses	10.38%		
Error as a % of Actual Sales (correcting sales)	0.46%		

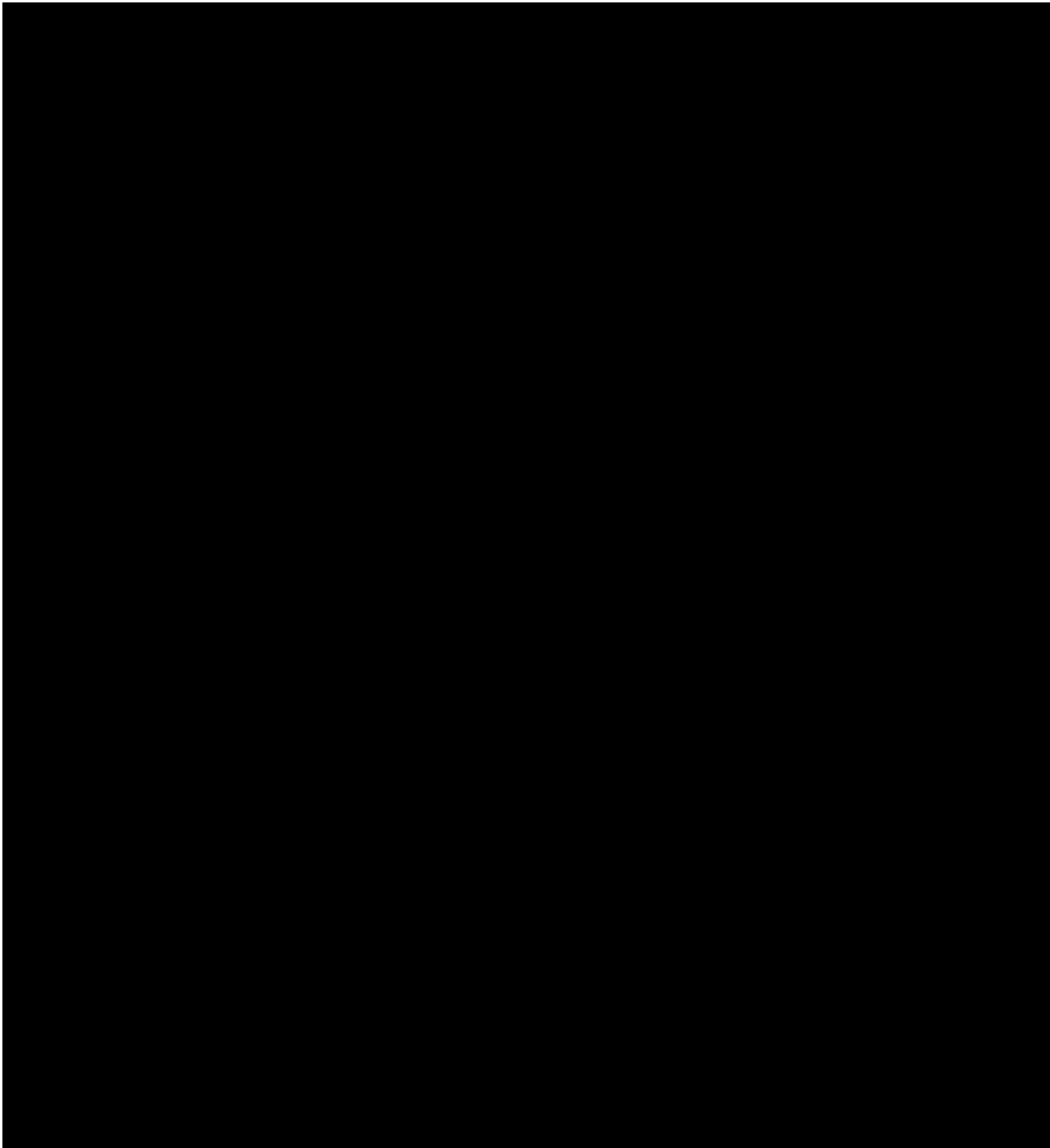
Appendix C – Calculation of losses for HV distribution network

Load	Average Consumption (MW)	LLF (loss load factor)	Peak Demand (MVA)
Abbotsbury ZS	7.51	0.065771987	36.91711626
Albion Park ZS	8.46	0.106103274	30.98923549
Ambarvale ZS	7.08	0.071553883	29.89014175
Anzac Village ZS	8.04	0.105972215	27.3158297
Appin ZS	1.72	0.123479915	5.812067214
Arndell Park ZS	14.57	0.556893931	30.71323236
Baulkham Hills 11kV	12.52	0.153626088	33.77682021
Bella Vista ZS	15.46	0.132808896	44.51324895
Berrima Junction ZS	0.38	0.001212031	14.42231207
Berry ZS	2.97	0.155572272	8.483523807
Blackheath ZS	2.63	0.18578993	6.967200817
Blackmans Flat ZS	2.48	0.137251543	7.387032961
Blaxland ZS	6.26	0.097603583	23.15545342
Bolong ZS	1.87	0.400645527	3.052896937
Bomaderry ZS	7.77	0.177286694	20.19985014
Bonnyrigg ZS	10.63	0.117490968	33.77437065
Bossley Park ZS	10.62	0.117460069	33.16585685
Bow Bowling ZS	27.30	0.475154188	40.9436212
Bowral ZS	8.12	0.201210872	19.60092319
Bringelly ZS	4.82	0.1878661	11.52019752
Bulli ZS	4.12	0.147639654	12.26136745
Bylong ZS	0.09	0.215770862	0.226568848
Cabramatta ZS	6.84	0.242682112	14.60286324
Cambridge Park ZS	6.16	0.091425694	24.87331208
Campbelltown ZS	20.79	0.173138613	51.70959598
Canley Vale ZS	11.76	0.172719087	29.68390194
Carramar ZS	6.87	0.207334442	15.78066153
Castle Hill ZS	8.36	0.121280462	25.03677859
Casula ZS	8.63	0.094037781	30.90940148
Cattai ZS	4.08	0.097616368	15.09818412
Cawdor ZS	8.49	0.104470839	28.63417143
Cheriton Avenue ZS	8.34	0.140409247	23.30397214
Chipping Norton ZS	7.14	0.115958658	22.76966728
Claremont Meadows ZS	9.67	0.137854065	27.73188646
Corrimal ZS	5.97	0.12717333	18.1194143
Cranebrook ZS	13.74	0.223679302	29.47794244
Culburra ZS	3.45	0.191433989	9.428354503
Dapto ZS	8.96	0.108047337	32.41063737
Darkes Forest ZS	0.12	0.02826713	0.842532481
Doonside ZS	11.57	0.100252329	43.11749318
Dundas ZS	10.83	0.117541151	34.24152201
East Richmond ZS	9.49	0.137622814	26.98559968
Eastern Creek ZS	10.97	0.313777222	20.61483572
Edmondson Park ZS	4.42	0.09777	16.85063423
Emu Plains ZS	9.30	0.107092553	31.25603433
Fairfield ZS	12.07	0.203299548	27.60956329
Figtree ZS	8.31	0.133921381	24.84166035
Gerringong ZS	2.42	0.194132468	6.073969158
Glenmore Park ZS	7.61	0.060657205	39.77353173
Glenorie ZS	2.27	0.134453024	6.766789306
Glossodia ZS	4.50	0.090088474	17.52902899
Granville ZS	13.20	0.177171214	32.21933408
Greystanes ZS	6.63	0.098254596	23.2602735
Hartley Vale ZS	0.23	0.037917929	1.33973682
Hazelbrook ZS	3.39	0.162884484	9.829540086
Helensburgh ZS	4.69	0.213233107	10.65776512
Hinchinbrook ZS	10.21	0.067644388	50.81661957
Holroyd ZS	12.98	0.131538194	37.95896251
Homepride ZS	13.59	0.257500923	27.49306712
Horsley Park ZS	3.72	0.292266996	7.256335163
Huntingwood ZS	36.45	0.604284462	47.12755707

Huskisson ZS	5.73	0.198582642	14.09363979
Ilford Hall ZS	0.17	0.151681622	0.558237882
Inner Harbour ZS	3.97	0.193264306	9.583979066
Jamberoo ZS	1.04	0.196920866	2.624105841
Jasper Rd ZS	9.25	0.095927429	33.39339269
Jordan Springs ZS	4.78	0.078503101	22.1411613
Kandos ZS	2.13	0.272344634	4.3720202
Kangaroo Valley ZS	0.89	0.213374645	2.188401666
Katoomba ZS	8.44	0.257441854	17.4685919
Kellyville ZS	4.13	0.061043514	22.26566219
Kembla Grange ZS	2.04	0.091158084	8.124252815
Kemps Creek ZS	5.18	0.117067493	16.15523201
Kenny Street ZS	6.63	0.220002882	14.98318437
Kenthurst ZS	6.93	0.108999378	23.58946026
Kentlyn ZS	9.12	0.126989595	29.53598729
Kiama ZS	5.05	0.169798384	13.88142663
Kingswood ZS	17.11	0.151124316	45.8259636
Kurrajong ZS	3.37	0.085476754	13.80629942
Leabons Lane ZS	8.74	0.177629249	21.43631392
Lennox ZS	10.43	0.231690215	22.44751355
Lithgow ZS	7.82	0.195251492	19.49073111
Liverpool 11kV	18.93	0.225720194	40.85756235
Luddenham ZS	2.88	0.111836393	9.184940857
Macquarie Fields ZS	9.93	0.147542696	27.87456705
Maldon ZS	8.39	0.175665994	21.49531726
Mamre ZS	25.61	0.23736656	54.82813237
Marayong ZS	14.89	0.206695079	34.85622677
Marsden Park ZS	3.59	0.077642859	20.28078161
Meadow Flat ZS	0.49	0.237395723	1.091495018
Menangle Park ZS	-	0	0
Minto ZS	24.32	0.204708757	56.16281046
Mittagong ZS	6.95	0.003598045	21.09703343
Moorebank ZS	10.20	0.230877447	22.52853249
Moss Vale ZS	8.76	0.195402406	21.63223706
Mount Ousley ZS	9.33	0.255943692	19.04780887
Mungerie Park ZS	17.09	0.062148578	87.46899906
Narellan ZS	19.38	0.08739861	72.62717117
Nepean 11kV	8.28	0.064546117	40.55388223
Newton ZS	12.98	0.20768944	29.75631642
North Eastern Creek ZS	11.58	0.270367232	22.90481766
North Leppington ZS	2.09	0.09313512	8.375118694
North Parramatta ZS	12.90	0.187857286	30.9136445
North Richmond ZS	6.33	0.144924042	17.91610696
North Rocks ZS	7.73	0.159097396	20.47527502
North Warragamba ZS	3.80	0.10128156	14.11018742
North Wollongong ZS	6.77	0.323391434	12.22329898
Northmead ZS	8.54	0.166149157	21.87691994
Nowra ZS	9.90	0.182641567	24.17266185
Oakdale ZS	0.72	0.070963236	3.3630367
Oran Park ZS	7.86	0.069165314	41.61522103
Parklea ZS	17.33	0.069800101	82.75138097
Penrith 11kV	19.12	0.230263333	41.24742665
Plumpton ZS	10.28	0.117355798	33.8339385
Port Central ZS	4.32	0.244147867	9.141462228
Port Kembla ZS	6.43	0.214585963	14.7616632
Portland ZS	0.96	0.207549488	2.617476899
Prestons ZS	6.90	0.064772375	35.77978807
Prospect ZS	11.51	0.200594586	26.41782959
Quakers Hill ZS	12.22	0.105565499	43.39361541
Quarries ZS	8.37	0.170071982	21.09423509
Ringwood ZS	3.11	0.157185395	19.96355576
Riverstone ZS	6.39	0.128985857	19.23378966
Robertson ZS	-	0	0
Rooty Hill ZS	12.78	0.15229378	34.94807703
Rosehill ZS	13.33	0.331829894	23.64146835
Russell Vale ZS	5.95	0.174421282	15.68259458
Rydalmere ZS	14.75	0.167744567	37.41543558
Schofields ZS	7.85	0.089936424	37.42292539

Seven Hills ZS	8.20	0.17146401	21.24296358
Shellharbour ZS	12.67	0.14381992	36.09492971
Sherwood ZS	7.83	0.107617731	25.62104665
Smithfield ZS	11.19	0.121660373	34.56206914
South Erskine Park ZS	1.40	0.217629811	3.762784343
South Granville ZS	7.77	0.133299877	22.44655425
South Leppington ZS	4.38	0.065915792	24.55516207
South Marsden Park ZS	5.57	0.131437348	17.11452044
South Nowra ZS	3.35	0.141586085	10.18568491
South Windsor ZS	14.20	0.205231101	33.17705109
South Wollongong ZS	6.26	0.260758284	12.72942619
Springwood ZS	7.85	0.103037043	27.58302571
St Marys ZS	10.17	0.112233307	32.41923174
Sussex Inlet ZS	2.18	0.178487741	6.034083198
Tahmoor ZS	6.35	0.137301459	19.31043899
The Oaks ZS	2.22	0.096066012	8.846740607
Tomerong ZS	3.30	0.155413487	10.37640912
Ulladulla ZS	8.69	0.20744267	22.11828126
Unanderra ZS	6.57	0.222176855	14.87956298
Warilla ZS	6.35	0.150581783	17.58294458
Wentworth Falls ZS	2.55	0.208468778	7.462665264
Werrington ZS	16.53	0.257068784	33.82021643
West Castle Hill ZS	11.46	0.103780703	37.49164733
West Liverpool 11kV	16.57	0.192771766	39.36510912
West Parramatta ZS	22.11	0.217297249	50.22912652
West Pennant Hills ZS	4.89	0.07963135	21.52120822
West Wetherill Park 11kV	12.80	0.308940418	26.69122053
West Wollongong ZS	5.40	0.19513396	12.91176462
Westmead ZS	14.99	0.338117422	26.45795191
Wetherill Park ZS	15.70	0.328109549	29.07145955
Whalan ZS	9.69	0.139156002	27.12837925
Wilton ZS	1.16	0.081860504	5.387512281
Windsor ZS	6.45	0.104578323	21.8061286
Wisemans ZS	2.19	0.173907938	5.76153258
Wombarra ZS	2.00	0.153656782	5.800258663
Woodpark ZS	10.23	0.31553153	19.09420549
Yatte Yattah ZS	1.17	0.149679321	3.679582713
Yennora ZS	8.68	0.201949861	20.11771715
Calderwood Mobile	0.00	0.000566772	0.005520593
Box Hill ZS	1.24	0.085043599	11.91214218





Appendix D – Calculation of losses for distribution substations

Rating (kVA)	No. in service	Total Losses (MW)	Assumed LLF	Avg full load series loss %	Avg full load series loss kW	Utilisation Factor	Series losses per tfr (kW)	Total Series Loss (MW)	No load Loss %	No load loss per tfr (kW)	Total No Load Losses (MW)
0	3	-	0.21	1.50%	0	50.00%	-	-	0.50%	0	0.0000
3	9	0.0002	0.21	1.50%	0.045	50.00%	0.00	0.00002	0.50%	0.015	0.0001
5	81	0.0023	0.21	1.50%	0.075	50.00%	0.00	0.00032	0.50%	0.025	0.0020
6	0	-	0.21	1.50%	0.09	50.00%	0.00	-	0.50%	0.03	0.0000
8	1	0.0000	0.21	1.50%	0.1125	11.00%	0.00	0.00000	0.50%	0.0375	0.0000
10	596	0.0366	0.21	1.50%	0.15	60.00%	0.01	0.00676	0.50%	0.05	0.0298
12	2	0.0001	0.21	1.50%	0.18	60.00%	0.01	0.00003	0.50%	0.06	0.0001
15	381	0.0351	0.21	1.50%	0.225	60.00%	0.02	0.00648	0.50%	0.075	0.0286
16	444	0.0430	0.21	1.50%	0.24	60.00%	0.02	0.00806	0.50%	0.08	0.0355
20	18	0.0022	0.21	1.20%	0.24	65.00%	0.02	0.00038	0.50%	0.1	0.0018
23	8	0.0012	0.21	1.20%	0.276	81.00%	0.04	0.00030	0.50%	0.115	0.0009
25	3798	0.5954	0.21	1.20%	0.3	71.00%	0.03	0.12062	0.50%	0.125	0.4748
30	2	0.0004	0.21	1.20%	0.36	60.00%	0.03	0.00005	0.50%	0.15	0.0003
50	1218	0.3544	0.21	1.20%	0.6	57.00%	0.04	0.04986	0.50%	0.25	0.3045
55	4	0.0010	0.21	1.20%	0.66	54.80%	0.04	0.00017	0.40%	0.22	0.0009
58	15	0.0043	0.21	1.20%	0.696	60.00%	0.05	0.00079	0.40%	0.232	0.0035
63	1836	0.5809	0.21	1.20%	0.756	63.70%	0.06	0.11827	0.40%	0.252	0.4627
75	6	0.0022	0.23	1.20%	0.9	60.00%	0.07	0.00045	0.40%	0.3	0.0018
100	2905	1.4430	0.23	1.20%	1.2	59.20%	0.10	0.28100	0.40%	0.4	1.1620
110	29	0.0120	0.23	1.10%	1.21	54.70%	0.08	0.00241	0.30%	0.33	0.0096
150	397	0.2477	0.23	1.10%	1.65	67.70%	0.17	0.06905	0.30%	0.45	0.1787
160	143	0.0895	0.23	1.10%	1.76	60.00%	0.15	0.02084	0.30%	0.48	0.0686
200	2836	2.2356	0.23	1.10%	2.2	61.00%	0.19	0.53397	0.30%	0.6	1.7016
220	384	0.3257	0.23	1.00%	2.2	61.00%	0.19	0.07230	0.30%	0.66	0.2534
250	759	0.8037	0.23	1.00%	2.5	73.30%	0.31	0.23449	0.30%	0.75	0.5693
260	38	0.0337	0.23	1.00%	2.6	63.10%	0.24	0.00905	0.25%	0.65	0.0247
300	3575	3.7823	0.23	1.00%	3	66.20%	0.30	1.08104	0.25%	0.75	2.6813
315	3354	3.5401	0.23	0.95%	2.9925	62.40%	0.27	0.89886	0.25%	0.7875	2.6413
400	1603	1.8231	0.23	0.95%	3.8	48.54%	0.21	0.33010	0.25%	1	1.6030
500	7482	11.9053	0.23	0.90%	4.5	57.42%	0.34	2.55284	0.25%	1.25	9.3525
600	44	0.0772	0.23	0.90%	5.4	45.35%	0.26	0.01124	0.25%	1.5	0.0660
750	241	0.5361	0.23	0.90%	6.75	47.44%	0.35	0.08421	0.25%	1.875	0.4519
800	26	0.0661	0.23	0.90%	7.2	57.13%	0.54	0.01405	0.25%	2	0.0520
910	0	-	0.23	0.90%	8.19	52.19%	0.51	-	0.25%	2.275	0.0000
1000	2972	11.1000	0.23	0.90%	9	77.30%	1.24	3.67602	0.25%	2.5	7.4300
1500	762	3.3241	0.23	0.90%	13.5	44.68%	0.63	0.47657	0.25%	3.75	2.8575
2000	3	0.0180	0.23	0.90%	18	55.00%	1.25	0.00376	0.25%	5	0.0150
2500	0	-	0.23	0.90%	22.5	52.36%	1.42	-	0.25%	6.25	0.0000
3000	0	-	0.23	0.90%	27	55.00%	1.88	-	0.25%	7.5	0.0000
5000	0	-	0.23	0.90%	45	58.21%	3.27	-	0.25%	12.5	0.0000
10000	0	-	0.23	0.90%	90	38.93%	3.14	-	0.25%	25	0.0000
Total	35975	43.1299						10.6644			32.47

