

REGIONS AND MARGINAL LOSS FACTORS: FY 2017-18

NATIONAL ELECTRICITY MARKET

Published: 06 November 2017





IMPORTANT NOTICE

Purpose

This document has been prepared by AEMO as the 'Regions Publication' under clause 2A.1.3 of the National Electricity Rules (Rules), and to inform Registered Participants of the inter-regional loss factor equations and intra-regional loss factors for 2017-18 under clauses 3.6.1 and 3.6.2 of the Rules, and has effect only for the purposes set out in the Rules. The Rules and the National Electricity Law (Law) prevail over this document to the extent of any inconsistency.

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VERSION RELEASE HISTORY

Version No.	Release date	Description
4.0	06 November 2017	 Added MLFs for: Columboola 132kV, Grosvenor PS Unit 1 and Unit 2, Staplyton in Queensland Leichardt Zone SS (Ausgrid), Williamsdale, Williamsdale (Essential Energy), Gullen Range solar farm, Smithfield Energy Facility, White Rock wind farm in New South Wales Mugga Lane solar farm, Royalla solar farm in Australian Capital Territory Deer Park, Kiata wind farm in Victoria Hornsdale Wind farm stage 1, stage 2 and stage 3, Edinburgh Generatation, Lonsdale Generation in South Australia Correction of: Typo on the MLF for Wivenhoe Small Hydro connection point (QABR1) – Table 3
3.0	01 June 2017	 Update to: MLF values for Canberra (ACA1), Williamsdale (NWDL) Mugga Lane Solar Farm and Royalla Solar Farm – Table 4, Table 7 and Table 8
2.0	15 May 2017	 Correction of: MLF value for Wivenhoe Small Hydro connection point (QABR1) – Table 3 typo on the Vd term for the SA – Vic Inter-regional loss factor equation (pages 35 and 38)
1.0	31 March 2017	 Final version. MLFs updated to reflect: Reduction in Queensland region consumption forecast Two committed solar farms at Griffith and Parkes 12 new TNIs and a new VTN in ACT
0.1	3 March 2017	Draft version



EXECUTIVE SUMMARY

This document details the 2017–18 inter-regional loss factor equations and the intra-regional loss factors, or marginal loss factors (MLF). MLFs represent electrical transmission losses across the five regions in the National Electricity Market (NEM) – Queensland, New South Wales (NSW), Victoria, South Australia, and Tasmania. AEMO publishes this information annually by 1 April as required by clause 3.6 of the National Electricity Rules (Rules). This document also serves as the Regions Publication under clause 2A.1.3 of the Rules.

Supply and demand patterns in the NEM are changing at a growing rate, influenced by a combination of drivers, leading to potentially greater uncertainty and volatility of power system flows. AEMO has completed a review and consultation on the Forward Looking Loss Factors (FLLF) methodology (Methodology), and the changes to the Methodology have been reflected in the 2017-18 MLFs calculation.

Major changes in load and generation patterns leading to differences between the 2017-18 and 2016-17 MLFs are as follows:

- Retirement of Hazelwood Power Station (PS) in Victoria in March 2017 has increased modelled power imports from Queensland to NSW, and from NSW to Victoria. Reduced forecast generation in Victoria has reduced power exports from Victoria to South Australia.
- Forecast Liquefied Natural Gas (LNG) and industrial consumption have decreased in Queensland.
- Forecast regional consumption has decreased in Queensland, South Australia and Tasmania.
- Forecast regional consumption has increased in NSW and Victoria.
- Increased forecast generation in Tasmania has decreased modelled power imports from Victoria.

These flow changes have an impact on electrical losses, and drive significant changes in MLFs in 2017–18 compared to 2016–17. They are:

- A reduction in MLFs at connection points in central and northern Queensland.
- A reduction in MLFs at connection points in northern NSW, and an increase in southern NSW.
- A reduction in MLFs at connection points in northern Victoria.
- An increase in MLFs at connection points in South Australia's Riverland, and an increase in MLFs at connection points in south-east South Australia.
- A general decrease in MLFs at connection points in Tasmania.

As well as the MLFs, this document includes other information related to marginal losses for 2017–18, that is:

- Inter-regional loss factor and loss equations.
- Virtual Transmission Nodes (VTNs).
- Connection point Transmission Node Identifiers (TNIs).
- Regions, Regional Reference Nodes (RRNs), and region boundaries.
- Brief overview of the Methodology AEMO uses to calculate MLFs and inter-regional loss factor equations.

AEMO applies a number of quality assurance steps when calculating MLFs. This includes engaging Ernst and Young to perform a two-step parallel MLF calculation to identify and resolve outcomes inconsistent with the Methodology.



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1. MARGINAL LOSS FACTORS BY REGION

This section shows the intra-regional loss factors, commonly known as marginal loss factors (MLFs), for financial year 2017-18, for every load or generation transmission node identity (TNI) in each NEM region.

1.1 Queensland Marginal Loss Factors

Table 1Queensland Loads

Abermain Abermain (Dual MLF – Generation) Abermain (Dual MLF – Load) Alan Sherriff Algester Alligator Creek Alligator Creek Ashgrove West Ashgrove West	33 110 110 132 33	QABM QABR QABR	1.0016 0.9990	0.9990	
Abermain (Dual MLF – Load) Alan Sherriff Algester Alligator Creek Alligator Creek Ashgrove West	110 132	QABR			
Alan Sherriff Algester Alligator Creek Alligator Creek Ashgrove West	132		1 0040	0.9951	
Algester Alligator Creek Alligator Creek Ashgrove West		0.407	1.0018	0.9951	
Alligator Creek Alligator Creek Ashgrove West	33	QASF	1.0383	1.0781	
Alligator Creek Ashgrove West		QALG	1.0153	1.0138	
Ashgrove West	132	QALH	1.0050	1.0383	
	33	QALC	1.0060	1.0452	
Ashgrove West	33	QAGW	1.0149	1.0152	
	110	QCBW	1.0129	1.0125	
Belmont	110	QBMH	1.0114	1.0091	
Belmont Wecker Road	33	QBBS	1.0089	0.9993	
Belmont Wecker Road	11	QMOB	1.0340	1.0308	
Biloela	66/11	QBIL	0.9235	0.9456	
Blackstone	110	QBKS	0.9999	0.9968	
Blackwater	66/11	QBWL	1.0001	1.0265	
Blackwater	132	QBWH	0.9988	1.0262	
Bluff	132	QBLF	0.9985	1.0252	
Bolingbroke	132	QBNB	0.9931	1.0240	
Bowen North	66	QBNN	1.0090	1.0337	
Boyne Island	275	QBOH	0.9593	0.9868	
Boyne Island	132	QBOL	0.9574	0.9824	
Braemar - Kumbarilla Park	275	QBRE	0.9654	0.9573	
Bulli Creek (Essential Energy)	132	QBK2	0.9752	0.9638	
Bulli Creek (Waggamba)	132	QBLK	0.9752	0.9638	
Bundamba	110	QBDA	1.0011	0.9983	
Burton Downs	132	QBUR	1.0116	1.0425	
Cairns	22	QCRN	1.0550	1.0904	
Cairns City	132	QCNS	1.0547	1.0895	
Callemondah (Rail)	132	QCMD	0.9494	0.9750	
Calliope River	132	QCAR	0.9472	0.9747	
Cardwell	22	QCDW	1.0482	1.0856	
Chinchilla	132	QCHA	0.9750	0.9705	
Clare	66	QCLR	1.0457	1.0910	
Collinsville Load	33	QCOL	1.0126	1.0444	





Columboola 132kVImage: status in the status in	Location	Voltage (kV)	TNI	2017-18 MLF	2016-17 MLF	Remark
Coppabella (Rail) 132 QCOP 1.0294 1.0610 Dan Glesson 66 QDGL 1.0394 1.0766 Dingo (Rail) 132 QDNG 0.9838 1.0059 Duaringa 132 QDNS 0.9838 1.0059 Dysart 66/22 QDYS 1.0156 1.0494 Eagle Downs Mine 132 QEGN 1.0268 0.9676 Edmonton 22 QELM 1.0603 1.0883 El Arish 22 QELA 1.0533 1.0883 Gadotit 667 0.9428 0.9884 0.9883 Gladstone South 6611 QGCN 1.0429 1.081 Goodna 33 QGCN 1.0483 1.081 Grantleigh (Rail) 132 QGRR 1.0483 1.081 Grantleigh (Rail) 132 QGRR 1.0491 1.091 Innisfail 22 QIN 1.0601 1.001 Invicta Load 1.021 1.044 1.03	Columboola 132kV	132	QCBB	0.9724		from
Dara Gleeson 66 QDGL 1.0381 1.0786 Dingo (Rail) 132 QDNG 0.8838 1.0059 Duaringa 132 QDRG 0.9874 0.9955 Dysart 6622 QDVS 1.0456 1.0494 Eagle Downs Mine 132 QEGD 1.0259 1.0617 Edmonton 22 QEMT 1.0603 1.0946 Egans Hill 66 QEGN 0.9428 0.9686 Garbutt 666 QGNG 0.9693 0.9833 Garbuts 66/11 QGST 0.9693 0.9833 Gadstone South 66/11 QGST 0.9634 0.9784 Goodna 3 QQDA 1.0420 1.0011 Gregory (Rail) 132 QGRE 0.9784 1.0612 Goodna 132 QGRE 0.9784 1.0091 Insifait 22 QKM 1.0460 1.1021 Invicta Load 132 QEMS 1.0047 1.	Columboola	132	QCBL	0.9715	0.9692	
Dingo (Rail) 132 QDNG 0.9838 1.0059 Duaringa 132 QDRG 0.9754 0.9955 Dysart 66/22 QDYS 1.0166 1.0444 Eagle Downs Mine 132 QEGD 1.0603 1.0444 Eadmonton 22 QEMT 1.0603 1.0446 Egans Hill 66 QEGN 0.9428 0.9686 Garbutt 66 QEGN 1.0533 1.0813 Garbutt 66 QGNG 1.0533 0.9883 Gladstone South 66/11 QGST 0.9534 0.9784 Goodna 33 QGDA 1.0050 1.0027 Goodna 33 QGDR 1.0483 1.0613 Granticipt (Rail) 132 QGRE 0.9731 1.007 Gregory (Rail) 132 QGRE 0.9731 1.0091 Invista 1.021 1.0246 0.9772 1.0476 Invista 1.022 QIKAM 1.0612	Coppabella (Rail)	132	QCOP	1.0294	1.0610	
Duaringa 132 QDRG 0.9754 0.9955 Dysart 66/22 QDYS 1.0156 1.0494 Eagle Downs Mine 132 QEGD 1.0269 1.0047 Eadmonton 22 QELM 1.0269 1.0046 Egans Hill 66 QEGN 0.9428 0.9686 Garbutt 66 QEGN 1.0420 1.0813 Garbutt 66 QGRA 1.0420 1.0813 Goodna 33 QGDN 1.0483 1.0027 Goodna 33 QGCN 1.0483 1.0027 Goodna 33 QGCN 1.0486 0.972 Gregory (Rail) 132 QGR 0.9791 1.001 Invista 2 QINF 1.0481 1.032 Invista 132 QGRN 1.0484 1.032 Invista 132 QINF 1.0660 1.102 Invista 132 QKCK 1.0175 1.0475	Dan Gleeson	66	QDGL	1.0391	1.0786	
Dysart 66/22 QDYS 1.0156 1.0494 Eagle Downs Mine 132 QEGD 1.0269 1.0617 Edmonton 22 QEMT 1.0603 1.0946 Egans Hill 66 QEGN 0.9428 0.9668 El Arish 22 QELA 1.0633 1.0863 Garbutt 666 QGAR 1.0420 1.0816 Gin Gin 132 QGNG 0.9693 0.9883 Gladstone South 66/11 QGSR 1.0420 1.0816 Gooryalla Riverside Mine 132 QGRN 1.0483 1.0813 Grantleigh (Raii) 132 QGRN 0.9426 0.9672 Innisfail 122 QINF 1.0600 1.1001 Invicta Load 132 QINV 0.9444 1.0327 Kamerunga 22 QINM 1.0604 1.0370 King Creek 132 QINV 0.9444 1.0370 Lilyvale (Barcaldine) 132 QINS	Dingo (Rail)	132	QDNG	0.9838	1.0059	
Égigle Downs Mine 1132 Q EGD 1.0268 1.0617 Edmonton 22 Q EMT 1.0603 1.0946 Egans Hill 66 Q EGN 0.9428 0.9686 El Arish 22 Q ELA 1.0503 1.0843 Garbutt 66 Q GAR 1.0420 1.0816 Gin Gin 132 Q GNG 0.9693 0.9683 Goadna 33 Q GDA 1.0420 1.0816 Goonyella Riverside Mine 132 Q GRN 1.0433 1.0813 Grantleigh (Rail) 132 Q GRN 0.9426 0.9672 Gregory (Rail) 132 Q GRN 0.9426 0.9672 Innisfail 22 Q GRM 1.0483 1.0813 Invicta Load 132 Q INV 0.9644 1.0327 Kamerunga 22 Q KAM 1.0084 1.0370 King Creek 132 Q LCM 0.9775 1.0061 Lilyvale (Barcaldine) 132 Q LCM	Duaringa	132	QDRG	0.9754	0.9955	
Edmonton 22 QEMT 1.0603 1.0946 Egans Hill 66 QEGN 0.9428 0.9686 El Arish 22 QELA 1.0503 1.0883 Garbutt 66 QGRN 1.0420 1.0816 Gin Gin 132 QGNS 0.9933 0.9883 Gladstone South 66/11 QGST 0.9534 0.9784 Goodna 33 QGDA 1.0050 1.0027 Goodna 132 QGRN 0.9426 0.9672 Gregory (Rai) 132 QGRN 0.9426 0.9672 Gregory (Rai) 132 QGRN 0.9426 0.9672 Innisfail 22 QGRN 0.9426 0.9672 Invicta Load 132 QGRN 1.0060 1.1001 Invicta Load 132 QGRM 1.0084 1.0327 Kamerunga 22 QKAM 1.0175 1.0475 Lilyvale 66 QLLL 0.9684 1.0122 <td>Dysart</td> <td>66/22</td> <td>QDYS</td> <td>1.0156</td> <td>1.0494</td> <td></td>	Dysart	66/22	QDYS	1.0156	1.0494	
Egans Hill 66 OEGN 0.9428 0.9686 El Arish 22 OELA 1.0533 1.0883 Garbutt 66 QGAR 1.0420 1.0816 Gin Gin 132 QGNG 0.9534 0.9784 Goodna 33 QGNR 1.0420 1.0027 Goonyella Riverside Mine 132 QGRN 0.9426 0.9672 Gregory (Rail) 132 QGRN 0.9426 0.9672 Gregory (Rail) 132 QGRN 0.9426 0.9672 Innistal 22 QINF 1.060 1.1001 Invicta Load 132 QGRN 0.9426 0.9672 Kamerunga 22 QINF 1.0601 1.1001 Invicta Load 132 QINV 0.9644 1.0370 Kamerunga 22 QKAM 1.0612 1.0045 Lilyvale 132 QLCM 0.9775 1.0061 Loganlea 133 QLCH 0.9775 <t< td=""><td>Eagle Downs Mine</td><td>132</td><td>QEGD</td><td>1.0269</td><td>1.0617</td><td></td></t<>	Eagle Downs Mine	132	QEGD	1.0269	1.0617	
L C QELA 1.0533 1.0883 Garbutt 66 QGAR 1.0420 1.0816 Gin Gin 132 QGNG 0.9693 0.9883 Gladstone South 66/11 QGST 0.9534 0.9784 Goodna 33 QGCR 1.0433 1.0813 Goonyella Riverside Mine 132 QGRN 1.0433 1.0813 Grantleigh (Rail) 132 QGRN 0.9426 0.9672 Gregory (Rail) 132 QGRN 0.9426 0.9672 Innisfail 22 QINF 1.0660 1.1260 Invicta Load 132 QGRE 0.971 1.0091 Invicta Load 132 QEMS 1.0621 1.0945 Kamerunga 22 QKAM 1.0612 1.0945 Kamerunga 132 QEMS 1.0175 1.0475 Lilyvale (Barcaldine) 132 QLCM 0.9775 1.0061 Loganlea 1010 QLMR 0.9	Edmonton	22	QEMT	1.0603	1.0946	
Garbutt 66 QGAR 1.0420 1.0816 Gin Gin 132 QGNG 0.9693 0.9883 Gidatsone South 66/11 QGST 0.9534 0.9784 Godna 33 QGQA 1.0085 1.027 Goonyella Riverside Mine 132 QGRR 1.0483 1.0813 Grantleigh (Rail) 132 QGRR 0.9426 0.9672 Gregory (Rail) 132 QGRR 0.9426 0.9672 Innisfail 222 QINF 1.0600 1.1001 Invicta Load 132 QIRM 1.0612 1.0045 Kamerunga 22 QINF 1.0600 1.1001 Invistai 122 QIMM 1.0175 1.0475 Kamerunga 232 QEMS 1.0044 1.0327 King Creek 132 QLCM 0.9775 1.0661 Ligvale 66 QLL 0.9883 0.9746 Loganlea 1012 1.0102 1.0045 <td>Egans Hill</td> <td>66</td> <td>QEGN</td> <td>0.9428</td> <td>0.9686</td> <td></td>	Egans Hill	66	QEGN	0.9428	0.9686	
Gin Gin 132 QGNG 0.9693 0.9883 Gladstone South 66/11 QGST 0.9534 0.9784 Goodna 33 QGDA 1.0050 1.0027 Goonyella Riverside Mine 132 QGYR 1.0483 1.0813 Grantleigh (Rail) 132 QGR 0.9791 1.0091 Ingham 66 QING 1.0600 1.1260 Innisfail 22 QINF 1.0600 1.1001 Invicta Load 132 QINV 0.9644 1.0327 Kamerunga 22 QINF 1.0600 1.1001 Invicta Load 132 QEMS 1.0844 1.0327 Kamerunga 22 QKAM 1.0612 1.0945 King Creek 132 QEKM 1.0475 1.0475 Lilyvale (Barcaldine) 132 QLCM 0.9775 1.0061 Loganlea 110 QLR 1.0112 1.0080 Mackay 33 QMKA 1.001	El Arish	22	QELA	1.0533	1.0883	
Gladstone South 66/11 QGST 0.9534 0.9784 Goodna 33 QGDA 1.0050 1.0027 Goonyella Riverside Mine 132 QGYR 1.0483 1.0813 Grantleigh (Rail) 132 QGRN 0.9426 0.9672 Gregory (Rail) 132 QGRN 0.9426 0.9672 Innisfail 22 QINF 1.0600 1.1001 Invicta Load 132 QINV 0.9644 1.0327 Kamerunga 22 QKAM 1.0612 1.0945 King Creek 132 QEKS 1.0044 1.0370 Lilyvale 66 QLL 0.9688 1.0122 Lilyvale (Barcaldine) 132 QLCM 0.9775 1.0661 Lilyvale (Barcaldine) 133 QLCM 0.9775 1.0061 Loganlea 110 QLCM 0.9775 1.0061 Mackay 33 QLCM 0.9333 0.9746 Midele Ridge (Eregon) 1101	Garbutt	66	QGAR	1.0420	1.0816	
Goodna 33 QCDA 1.0050 1.0027 Goonyella Riverside Mine 132 QGYR 1.0483 1.0813 Grantleigh (Rail) 132 QGRN 0.9426 0.9672 Gregory (Rail) 132 QGRE 0.9791 1.0091 Ingham 66 QING 1.0660 1.1260 Innisfail 22 QINF 1.0602 1.001 Invicta Load 132 QEMM 1.0612 1.0045 Kamerunga 22 QKM 1.0612 1.0945 King Creek 132 QEMS 1.0175 1.0475 Lilyvale (Barcaldine) 132 QLCM 0.9775 1.0061 Loganlea 33 QLCM 0.9775 1.0061 Loganlea 33 QLCM 0.9775 1.0061 Middle Ridge (Energex) 110 QLMK 1.021 1.0322 Middle Ridge (Energex) 110 QMRA 1.0021 1.0324 Middle Ridge (Erergex) 1101	Gin Gin	132	QGNG	0.9693	0.9883	
Goonyella Riverside Mine 132 QGYR 1.0483 1.0813 Grantleigh (Rail) 132 QGRN 0.9426 0.9672 Gregory (Rail) 132 QGRE 0.9791 1.0091 Ingham 66 QING 1.0660 1.1260 Innisfall 22 QINF 1.0600 1.001 Invistal Load 132 QINV 0.9644 1.0327 Kamerunga 22 QKAM 1.0612 1.0945 King Creek 132 QKCK 1.0175 1.0475 Lilyvale (Barcaldine) 132 QLCM 0.9775 1.0061 Loganlea 33 QLGL 1.0148 1.017 Loganlea 1010 QLRA 0.9833 0.9746 Middle Ridge (Energex) 110 QMRA 1.0021 1.0392 Middle Ridge (Erergex) 110 QMRA 1.0171 1.0166 Middle Ridge (Erergex) 110 QMRA 1.0142 1.0172 Molendinar 33<	Gladstone South	66/11	QGST	0.9534	0.9784	
Grantleigh (Rail) 1132 QGRN 0.9426 0.9672 Gregory (Rail) 1132 QGRE 0.9791 1.0091 Ingham 66 QING 1.0600 1.1260 Innistail 22 QINF 1.0600 1.1011 Invicta Load 132 QINV 0.9644 1.0327 Kamerunga 22 QKAM 1.0121 1.0945 Kermis 1.032 QEMS 1.0084 1.0370 King Creek 1.032 QKCK 1.0175 1.0475 Lilyvale (Barcaldine) 132 QLCM 0.9775 1.0061 Loganlea 33 QLKH 1.0148 1.0117 Loganlea 33 QMKA 1.0021 1.0392 Middle Ridge (Energex) 1110 QMRR 0.9833 0.9746 Middle Ridge (Ergon) 1101 QMRR 0.9171 1.0166 Molendinar 1.012 1.0102 1.0172 Moranbah (Mine) 66 QMRN 1	Goodna	33	QGDA	1.0050	1.0027	
Gregory (Raii) 132 QGRE 0.0791 1.091 Ingham 66 QING 1.0660 1.1260 Innisfail 22 QINF 1.0600 1.1011 Invicta Load 132 QINV 0.9644 1.0327 Kamerunga 22 QKAM 1.0612 1.0945 Kemmis 132 QEMS 1.0844 1.0370 King Creek 132 QKCK 1.0175 1.0475 Lilyvale 66 QLIL 0.9808 1.0122 Lilyvale (Barcaldine) 132 QLCM 0.9775 1.0061 Loganlea 133 QLGL 1.0148 1.0117 Loganlea 110 QLGH 1.0121 1.0380 Mackay 33 QMKA 1.0021 1.332 Midel Ridge (Engenx) 1110 QMRR 0.9746 Mindi (Raii) 132 QMMD 0.9846 1.0177 Molendinar 33 QMAL 1.0142 1.0102 </td <td>Goonyella Riverside Mine</td> <td>132</td> <td>QGYR</td> <td>1.0483</td> <td>1.0813</td> <td></td>	Goonyella Riverside Mine	132	QGYR	1.0483	1.0813	
Ingham66QING1.06601.1260Innisfail22QINF1.06001.1001Invicta Load132QINV0.96441.0327Kamerunga22QKAM1.06121.0945Kemmis132QEMS1.00841.0370King Creek132QKCK1.01751.0475Lilyvale66QLIL0.98081.0122Lilyvale (Barcaldine)132QLCM0.97751.0611Loganlea33QLGL1.01481.0117Loganlea1010QLGH1.01211.0392Middle Ridge (Energex)1110QMRX0.98330.9746Middle Ridge (Ergon)1132QMND0.98461.0177Molendinar33QMAL1.01421.0102Moranbah (Mine)66QMRN1.03441.0721Moranbah (Mine)132QMRS1.03331.0719Moranbah South (Rail)1132QMRS1.03331.0719Moranbah Substation132QMRH1.03331.0719Mudgeeraba33QMEH1.03331.0719Mudgeeraba33QMGE1.04781.0783Mudgeeraba132QMRH1.04781.0783	Grantleigh (Rail)	132	QGRN	0.9426	0.9672	
Innisfail 1.0600 1.1001 Innisfail 132 QINF 1.0600 1.1001 Invicta Load 132 QINV 0.9644 1.0327 Kamerunga 22 QKAM 1.0612 1.0945 Kemmis 132 QEMS 1.0175 1.0475 King Creek 132 QKCK 1.0175 1.0475 Lilyvale (Barcaldine) 132 QLCM 0.9775 1.0061 Loganlea 133 QLGH 1.012 1.0080 Mackay 33 QMKA 1.0021 1.0392 Middle Ridge (Energex) 110 QMRS 0.9833 0.9746 Middle Ridge (Ergon) 110 QMRG 0.9833 0.9746 Molendinar 132 QMND 0.9846 1.0172 Molendinar 110 QMRR 1.0142 1.0102 Moranbah (Mine) 666 QMRN 1.0441 1.0526 Moranbah South (Rail) 132 QMRS 1.0333 1.07	Gregory (Rail)	132	QGRE	0.9791	1.0091	
Invicta Load1132QINV0.96441.0327Kamerunga22QKAM1.06121.0945Kemmis1132QEMS1.00841.0370King Creek1132QKCK1.01751.0475Lilyvale66QLIL0.98081.0122Lilyvale (Barcaldine)132QLCM0.97751.0061Loganlea1101QLGH1.01121.0080Mackay33QMKA1.00211.0392Middle Ridge (Energex)1101QMRS0.98330.9746Middle Ridge (Ergon)1101QMRG0.98330.9746Molendinar1101QMRA1.01421.0102Moranbah (Mine)66QMRN1.03421.0120Moranbah South (Rail)132QMBS1.03421.0730Moranbah Substation132QMRH1.03331.0719Moura66/11QMRA0.96090.9779Mt McLaren (Rail)132QMTM1.04781.0783Mudgeeraba33QMGL1.01691.0121Mudgeeraba33QMGL1.01691.0121Mudgeeraba33QMGL1.01691.0121Mudgeeraba101QMGB1.01691.0121	Ingham	66	QING	1.0660	1.1260	
Kamerunga22QKAM1.06121.0945Kemmis132QEMS1.00841.0370King Creek132QKCK1.01751.0475Lilyvale66QLL0.98081.0122Lilyvale (Barcaldine)132QLCM0.97751.0061Loganlea33QLGE1.01481.0117Loganlea1101QLGH1.01121.0080Mackay33QMKA1.00211.0392Middle Ridge (Eregex)61110QMRG0.98330.9746Mindi (Rail)132QMND0.98461.0177Molendinar133QMAL1.01421.0102Moranbah (Mine)66QMRN1.03441.0721Moranbah South (Rail)132QMBS1.03421.0730Moranbah Substation132QMRA1.04781.0730Moranbah Substation132QMRH1.04781.0783Mudgeeraba33QMGL1.01691.0121Mudgeeraba132QMTM1.04781.0783	Innisfail	22	QINF	1.0600	1.1001	
Kemmis132QEMS1.00841.0370King Creek132QKCK1.01751.0475Lilyvale66QLIL0.98081.0122Lilyvale (Barcaldine)132QLCM0.97751.0061Loganlea33QLGL1.01481.0117Loganlea110QLGH1.01211.0800Mackay33QMKA1.00211.0392Middle Ridge (Energex)110QMRX0.98330.9746Mindi (Rail)132QMND0.98461.0177Molendinar110QMRR1.01421.0102Moranbah (Mine)66QMRN1.03441.0721Moranbah South (Rail)132QMBS1.03421.0730Moranbah Substation132QMRH1.03331.0719Moranbah Substation132QMRH1.03331.0719Mudgeeraba33QMGL1.04781.0783Mudgeeraba132QMTM1.04781.0783	Invicta Load	132	QINV	0.9644	1.0327	
King Creek132QKCK1.01751.0475Lilyvale66QLIL0.98081.0122Lilyvale (Barcaldine)132QLCM0.97751.0061Loganlea33QLGL1.01481.0117Loganlea110QLGH1.01211.0392Mackay33QMKA1.00211.0392Middle Ridge (Energex)110QMRX0.98330.9746Middle Ridge (Ergon)110QMRG0.98330.9746Mindi (Rail)132QMND0.98461.0177Molendinar1013QMRA1.01421.0102Moranbah (Mine)66QMRN1.03641.0721Moranbah (Rail)132QMBS1.03421.0730Moranbah South (Rail)132QMRS1.03331.0719Moura66/11QMRA0.96090.9779Mt McLaren (Rail)132QMTM1.04781.0783Mudgeeraba33QMGL1.01691.0121Mudgeeraba101QMGB1.01651.0113	Kamerunga	22	QKAM	1.0612	1.0945	
Lilyvale Model QLIL 0.9808 1.0122 Lilyvale (Barcaldine) 132 QLCM 0.9775 1.0061 Loganlea 33 QLGL 1.0148 1.0117 Loganlea 100 QLGH 1.0148 1.0117 Loganlea 110 QLGH 1.0121 1.0080 Mackay 33 QMKA 1.0021 1.0392 Middle Ridge (Energex) 110 QMRZ 0.9833 0.9746 Middle Ridge (Ergon) 110 QMRG 0.9833 0.9746 Mindi (Rail) 132 QMND 0.9846 1.0177 Molendinar 110 QMAR 1.0142 1.0102 Moranbah (Mine) 66 QMRN 1.0364 1.0721 Moranbah (South (Rail) 132 QMBS 1.0323 1.0721 Moranbah South (Rail) 132 QMBS 1.0344 1.0526 Moranbah Substation 132 QMRH 1.0333 1.0719 Moura 66/11 <td>Kemmis</td> <td>132</td> <td>QEMS</td> <td>1.0084</td> <td>1.0370</td> <td></td>	Kemmis	132	QEMS	1.0084	1.0370	
Lilyvale (Barcaldine) 132 QLCM 0.9775 1.0061 Loganlea 33 QLGL 1.0148 1.0117 Loganlea 100 QLGH 1.0112 1.0080 Mackay 33 QMKA 1.0021 1.0392 Middle Ridge (Energex) 110 QMRX 0.9833 0.9746 Middle Ridge (Ergon) 110 QMRG 0.9833 0.9746 Mindi (Rail) QMRG 0.9833 0.9746 Molendinar 1.012 1.0102 1.0177 Molendinar 1.011 QMRR 1.0147 1.0106 Moranbah (Mine) 66 QMRN 1.0142 1.0102 Moranbah Town) 111 QMRL 1.0142 1.0102 Moranbah Substation 132 QMBS 1.0343 1.0730 Moura 66/11 QMRA 0.9609 0.9779 Mt McLaren (Rail) 132 QMTM 1.0478 1.0783 Mudgeeraba 33 QMGL 1.0169	King Creek	132	QKCK	1.0175	1.0475	
Loganlea 33 QLGL 1.0148 1.0117 Loganlea 110 QLGH 1.0148 1.0112 1.0080 Mackay 33 QMKA 1.0021 1.0392 Middle Ridge (Energex) 110 QMRX 0.9833 0.9746 Middle Ridge (Ergon) 110 QMRG 0.9833 0.9746 Mindi (Rail) 132 QMND 0.9846 1.0177 Molendinar 110 QMAR 1.0147 1.0106 Moranbah (Mine) 66 QMRN 1.0142 1.0102 Moranbah South (Rail) 132 QMBS 1.0721 1.0102 Moranbah Substation 132 QMBS 1.0721 1.0102 Moranbah Substation 132 QMBS 1.0333 1.0719 Moura 66/11 QMRA 0.9609 0.9779 Mt McLaren (Rail) 132 QMTM 1.0478 1.0783 Mudgeeraba 33 QMGE 1.0169 1.0112	Lilyvale	66	QLIL	0.9808	1.0122	
Loganlea 110 QLGH 1.0112 1.0080 Mackay 33 QMKA 1.0021 1.0392 Middle Ridge (Energex) 110 QMRX 0.9833 0.9746 Middle Ridge (Ergon) 110 QMRG 0.9833 0.9746 Mindi (Rail) QMRG 0.9833 0.9746 Molendinar 1012 QMRG 0.9846 1.0177 Molendinar 110 QMAR 1.0147 1.0106 Moranbah (Mine) 66 QMRN 1.0442 1.0102 Moranbah South (Rail) 132 QMBS 1.0342 1.0721 Moranbah Substation 132 QMBS 1.0342 1.0730 Moran 66/11 QMRA 1.0333 1.0719 Moura 66/11 QMRA 0.9609 0.9779 Mt McLaren (Rail) 132 QMTM 1.0478 1.0783 Mudgeeraba 33 QMGL 1.0169 1.0121	Lilyvale (Barcaldine)	132	QLCM	0.9775	1.0061	
Mackay 33 QMKA 1.0021 1.0392 Middle Ridge (Energex) 110 QMRX 0.9833 0.9746 Middle Ridge (Ergon) 110 QMRG 0.9833 0.9746 Mindi (Rail) QMRG 0.9833 0.9746 Mindi (Rail) 132 QMND 0.9846 1.0177 Molendinar 110 QMAR 1.0147 1.0106 Moranbah (Mine) 66 QMRN 1.0364 1.0721 Moranbah (Mine) 111 QMRL 1.0142 1.0102 Moranbah (Mine) 66 QMRN 1.0364 1.0721 Moranbah South (Rail) 132 QMBS 1.0342 1.0730 Moranbah Substation 132 QMBS 1.0333 1.0719 Moura 66/11 QMRA 0.9609 0.9779 Mt McLaren (Rail) 132 QMTM 1.0478 1.0783 Mudgeeraba 33 QMGL 1.0169 1.0121	Loganlea	33	QLGL	1.0148	1.0117	
Middle Ridge (Energex)110QMRX0.98330.9746Middle Ridge (Ergon)110QMRG0.98330.9746Mindi (Rail)132QMND0.98461.0177Molendinar110QMAR1.01471.0106Molendinar33QMAL1.01421.0102Moranbah (Mine)66QMRN1.03641.0721Moranbah (Town)111QMRS1.03421.0730Moranbah South (Rail)132QMBS1.03421.0730Moranbah Substation132QMRH1.03331.0719Moura66/11QMRA0.96090.9779Mt McLaren (Rail)132QMTM1.04781.0783Mudgeeraba33QMGL1.01691.0121Mudgeeraba110QMGB1.01651.0113	Loganlea	110	QLGH	1.0112	1.0080	
Middle Ridge (Ergon)110QMRG0.98330.9746Mindi (Rail)132QMND0.98461.0177Molendinar110QMAR1.01471.0106Molendinar33QMAL1.01421.0102Moranbah (Mine)66QMRN1.03641.0721Moranbah (Town)111QMRL1.04411.0526Moranbah South (Rail)132QMBS1.03331.0719Moura66/11QMRA0.96090.9779Mt McLaren (Rail)132QMTM1.04781.0783Mudgeeraba33QMGL1.01691.0121Mudgeeraba101QMGB1.01651.0113	Mackay	33	QMKA	1.0021	1.0392	
Mindi (Rail)132QMND0.98461.0177Molendinar110QMAR1.01471.0106Molendinar33QMAL1.01421.0102Moranbah (Mine)66QMRN1.03641.0721Moranbah (Town)111QMRL1.04411.0526Moranbah South (Rail)132QMBS1.03331.0719Moura66/11QMRA0.96090.9779Mt McLaren (Rail)132QMTM1.04781.0783Mudgeeraba33QMGL1.01691.0121Mudgeeraba100100QMGB1.01651.0113	Middle Ridge (Energex)	110	QMRX	0.9833	0.9746	
Molendinar 110 QMAR 1.0147 1.0106 Molendinar 33 QMAL 1.0142 1.0102 Moranbah (Mine) 66 QMRN 1.0364 1.0721 Moranbah (Town) 111 QMRL 1.0441 1.0526 Moranbah South (Rail) 132 QMBS 1.0342 1.0730 Moranbah Substation 132 QMRH 1.0333 1.0719 Moura 66/11 QMRA 0.9609 0.9779 Mt McLaren (Rail) 132 QMTM 1.0448 1.0783 Mudgeeraba 33 QMGL 1.0169 1.0121 Mudgeeraba 101 QMGB 1.0165 1.0113	Middle Ridge (Ergon)	110	QMRG	0.9833	0.9746	
Molendinar 33 QMAL 1.0142 1.0102 Moranbah (Mine) 66 QMRN 1.0364 1.0721 Moranbah (Town) 111 QMRL 1.0441 1.0526 Moranbah South (Rail) 132 QMBS 1.0342 1.0730 Moranbah Substation 132 QMRH 1.0333 1.0719 Moura 66/11 QMRA 0.9609 0.9779 Mt McLaren (Rail) 132 QMTM 1.0448 1.0783 Mudgeeraba 33 QMGL 1.0169 1.0121 Mudgeeraba 110 QMGB 1.0165 1.0113	Mindi (Rail)	132	QMND	0.9846	1.0177	
Moranbah (Mine)66QMRN1.03641.0721Moranbah (Town)111QMRL1.04411.0526Moranbah South (Rail)132QMBS1.03421.0730Moranbah Substation132QMRH1.03331.0719Moura66/11QMRA0.96090.9779Mt McLaren (Rail)132QMTM1.04781.0783Mudgeeraba33QMGL1.01691.0121Mudgeeraba110QMGB1.01651.0113	Molendinar	110	QMAR	1.0147	1.0106	
Moranbah (Town)11QMRL1.04411.0526Moranbah South (Rail)132QMBS1.03421.0730Moranbah Substation132QMRH1.03331.0719Moura66/11QMRA0.96090.9779Mt McLaren (Rail)132QMTM1.04781.0783Mudgeeraba33QMGL1.01691.0121Mudgeeraba110QMGB1.01651.0113	Molendinar	33	QMAL	1.0142	1.0102	
Moranbah South (Rail) 132 QMBS 1.0342 1.0730 Moranbah Substation 132 QMRH 1.0333 1.0719 Moura 66/11 QMRA 0.9609 0.9779 Mt McLaren (Rail) 132 QMTM 1.0478 1.0783 Mudgeeraba 33 QMGL 1.0169 1.0121 Mudgeeraba 110 QMGB 1.0165 1.0113	Moranbah (Mine)	66	QMRN	1.0364	1.0721	
Moranbah Substation 132 QMRH 1.0333 1.0719 Moura 66/11 QMRA 0.9609 0.9779 Mt McLaren (Rail) 132 QMTM 1.0478 1.0783 Mudgeeraba 33 QMGL 1.0169 1.0121 Mudgeeraba 110 QMGB 1.0165 1.0113	Moranbah (Town)	11	QMRL	1.0441	1.0526	
Moura 66/11 QMRA 0.9609 0.9779 Mt McLaren (Rail) 132 QMTM 1.0478 1.0783 Mudgeeraba 33 QMGL 1.0169 1.0121 Mudgeeraba 110 QMGB 1.0165 1.0113	Moranbah South (Rail)	132	QMBS	1.0342	1.0730	
Mt McLaren (Rail) 132 QMTM 1.0478 1.0783 Mudgeeraba 33 QMGL 1.0169 1.0121 Mudgeeraba 110 QMGB 1.0165 1.0113	Moranbah Substation	132	QMRH	1.0333	1.0719	
Mudgeeraba 33 QMGL 1.0169 1.0121 Mudgeeraba 110 QMGB 1.0165 1.0113	Moura	66/11	QMRA	0.9609	0.9779	
Mudgeeraba 110 QMGB 1.0165 1.0113	Mt McLaren (Rail)	132	QMTM	1.0478	1.0783	
-	Mudgeeraba	33	QMGL	1.0169	1.0121	
Murarrie (Belmont) 110 QMRE 1.0121 1.0100	Mudgeeraba	110	QMGB	1.0165	1.0113	
	Murarrie (Belmont)	110	QMRE	1.0121	1.0100	





Newlands 66 QNLD 1.0715 1.0809 North Goonyelia 132 QNGY 1.0499 1.0820 Nerwich Park (Rail) 132 QNOR 1.0007 1.0320 Ochey 110 QCKT 0.9779 0.6864 Oonooie (Rail) 132 QOON 1.0103 1.0399 Orana LNG 275 QORH 0.9678 0.6633 Palmwoods 132 QPAN 0.9461 0.9699 Pandoin 66 QPAL 0.9457 0.9700 Peak Downs (Rail) 132 QPAN 0.9461 0.9699 Proserpine 66 QPAL 1.0280 1.0672 Proserpine 66 QPRO 1.0439 1.0770 Queensland Alumina Ltd (Gladstone South) 132 QQAH 1.0356 Ragian 275 QRGL 0.9427 0.9665 Rocklang (Rail) 132 QQCK 0.9439 0.9657 Rocklands (Rail) 132 QRCK <t< th=""><th>Location</th><th>Voltage (kV)</th><th>TNI</th><th>2017-18 MLF</th><th>2016-17 MLF</th><th>Remark</th></t<>	Location	Voltage (kV)	TNI	2017-18 MLF	2016-17 MLF	Remark
Norrwich Goonyella 132 QNGY 1.0499 1.0820 Norwich Park (Rail) 132 QNOR 1.0007 1.0362 Oakey 110 QOKT 0.9773 0.9684 Ocnocie (Rail) 132 QONH 1.0105 1.0399 Orana LNG 275 QORH 0.9678 0.9633 Palmoxods 132 QPMD 1.0566 1.0120 Pandoin 66 QPU 0.9461 0.9599 Pendoin 66 QPU 1.0680 1.0672 Proneer Valley 66 QPV 1.0680 1.0672 Poserpine 66 QPV 1.0639 1.0770 Queensland Alumina Ltd (Gladstone 322 QQAH 1.0344 1.0755 Ragfan 275 QRGL 0.9427 0.9686 South) 1.033 1.0007 1.0339 1.0072 Reckhampton 66 QRCK 0.9399 0.9657 Rockklands (Rail) 1.0136 1.0012 <td>Nebo</td> <td>11</td> <td>QNEB</td> <td>0.9846</td> <td>1.0116</td> <td></td>	Nebo	11	QNEB	0.9846	1.0116	
Norwich Park (Rail) 132 QNOR 1.0007 1.0362 Cakey 110 QOKT 0.9779 0.9684 Oonoie (Rail) 132 QOON 1.0103 1.0399 Orana LNG 275 QORH 0.9678 0.9633 Painwoods 132 QPWD 1.0556 1.0120 Pandoin 66 QPAL 0.9457 0.9700 Peak Downs (Rail) 132 QPKD 1.0260 1.0672 Proserpine 66 QPRO 1.0439 1.0770 Queensland Alumina Ltd (Gladstone 132 QQAH 0.9666 0.9829 South) 1.022 QQAH 1.0344 1.0776 Queensland Nickel (Yabulu) 132 QQAH 1.0345 1.0107 Raglan 275 QRGL 0.9427 0.9666 Rocklands (Rail) 10130 1.0077 1.0352 Rocklands (Rail) 10130 1.0076 1.0193 Rocklands (Rail) 10160 QREK	Newlands	66	QNLD	1.0715	1.0809	
Oakey 110 QOK 9.9779 0.9684 Conocie (Rail) 112 QOON 1.0103 1.0399 Orana LNG 275 QORH 0.9678 0.9633 Palmwoods 132 QPWD 1.0565 1.0120 Pandoin 666 QPAL 0.9467 0.9699 Pondoin 666 QPAV 1.0680 1.0672 Poneer Valley 666 QPRV 1.0439 1.0770 Queensland Alumina Ltd (Gladstone South) 1.02 QQAH 0.9455 0.9829 Queensland Nickel (Yabulu) 1.22 QQAH 1.0344 1.0735 Redbank Plains 1.11 QRPN 1.0034 1.0170 Rockhampton 666 QRCD 1.0439 0.9726 Rockhampton 666 QRCD 1.0138 1.0129 Rockhampton 666 QRCS 1.0232 1.0667 Runcom 133 QRRS 1.0141 1.0150 Sourd Trine 110	North Goonyella	132	QNGY	1.0499	1.0820	
Oonooie (Rail) 1.32 QON 1.0103 1.0399 Orana LNG 275 QORH 0.9678 0.9633 Palmwoods 1.32 QPWD 1.0056 1.0120 Pandoin 1.32 QPAN 0.9467 0.9609 Pandoin 66 QPAL 0.9457 0.9700 Peak Downs (Rail) 1.32 QPKD 1.0280 1.0672 Proserpine 66 QPRO 1.0439 1.0770 Queensland Alumina Ltd (Gladstone 1.32 QQAH 0.9555 0.9829 Queensland Nickel (Yabulu) 1.32 QQAH 1.0343 1.0770 Queensland Nickel (Yabulu) 1.32 QQAH 1.0343 1.0071 Redbank Plains 1.11 QRRS 0.9427 0.9686 Redkank (Rail) 1.32 QRCK 0.9399 0.9657 Rocklands (Rail) 1.32 QRCK 1.0329 1.0652 Rocklands (Rail) 1.32 QRCK 1.0359 1.0657 Rockl	Norwich Park (Rail)	132	QNOR	1.0007	1.0362	
Orana LNG QORH QORH QORH QORH QORH QORA3 Painwoods 132 QPWD 1.0066 1.0120 Pandoin 132 QPAN 0.9461 0.9699 Pandoin 66 QPAD 1.0260 1.0672 Pioneer Valley 66 QPKD 1.0260 1.0437 Proserpine 66 QPRO 1.0438 1.0770 Queensland Alumina Ltd (Gladstone South) 132 QQAH 0.9565 0.9829 Queensland Nickel (Yabulu) 132 QQAH 1.0344 1.0735 Reghank Plains 111 QRRD 1.0136 1.0129 Rockhampton 666 QRCC 0.9481 0.9726 Rockhamds (Rail) 132 QRCK 0.9399 0.9657 Rockhamgton 666 QRCC 0.9481 0.9726 Rockhamgton 666 QRCK 0.9399 0.9657 Rockhamgton 666 QRCK 0.9399 0.9657	Oakey	110	QOKT	0.9779	0.9684	
Palmwoods 1.012 QPWD 1.0056 1.0120 Pandoin 132 QPAN 0.9461 0.9699 Pandoin 66 QPAL 0.9461 0.9699 Peak Downs (Rall) 132 QPAN 1.0270 1.0270 Proserpine 66 QPKO 1.0439 1.0770 Queensland Alumina Ltd (Gladstone south) 132 QQAH 0.9565 0.9829 Queensland Nickel (Yabulu) 132 QQAH 1.0344 1.0735 Redank Plains 111 QRPN 1.0344 1.0735 Redkank Plains 1132 QQNH 1.0344 1.0735 Rockhangton 66 QRCC 0.9481 0.9726 Rockhands (Rail) 132 QRCK 0.3939 0.9657 Rocklands (Rail) 1102 QRCK 0.3939 0.9657 Rockampton 63 QRCS 1.029 1.0052 Rouson 132 QRCK 0.9399 0.9657 Rouson 1.010<	Oonooie (Rail)	132	QOON	1.0103	1.0399	
Pandoin 132 QPAN 0.9461 0.9699 Pandoin 66 QPAL 0.9457 0.9700 Peak Downs (Rail) 132 QPKD 1.0280 1.0672 Pioneer Valley 66 QPKD 1.0487 0.9700 Queensland Alumina Ltd (Gladstone South) 132 QQAH 0.9555 0.9829 Queensland Nickel (Yabulu) 132 QQAH 1.0344 1.0735 Reglan 275 QRGL 0.9427 0.9886 Redbank Plains 111 QRPN 1.0030 1.0007 Richlands 33 QRLD 1.0136 1.0129 Rocklands (Rail) 132 QRCS 0.9481 0.9766 Rocklands (Rail) 132 QRCS 0.9481 0.9766 Rocklands (Rail) 132 QRCS 1.0021 0.067 Rocklands (Rail) 1032 QRCS 1.029 1.067 Rocklands (Rail) 100 QRCS 1.029 1.067 South Fine	Orana LNG	275	QORH	0.9678	0.9633	
Pandoin 66 QPAL 0.9457 0.9700 Peak Downs (Rail) 132 QPKD 1.0280 1.0672 Pioner Valley 66 QPKO 1.0439 1.0770 Proserpine 66 QPKO 1.0439 1.0770 Queensland Alumina Ltd (Gladstone) 132 QQAH 0.9655 0.9829 South) 132 QQNH 1.034 1.0735 Queensland Nickel (Yabulu) 132 QQNH 1.0300 1.0007 Redbank Plains 11 QRPN 1.0030 1.0007 Richlands 33 QRLD 1.0136 1.0129 Rocklands (Rail) 132 QRCK 0.9427 0.9666 Rocklands (Rail) 1132 QRCK 0.9427 0.9667 Rocklands (Rail) 1132 QRCK 0.9393 0.967 Runcorn 33 QRDS 1.042 1.062 South Fine 1101 QSVK 1.049 1.049 Sounp Creek 132	Palmwoods	132	QPWD	1.0056	1.0120	
Peak Downs (Rail) 132 QPKD 1.0280 1.0672 Pioneer Valley 66 QPIV 1.0060 1.0487 Proserpine 66 QPRO 1.0439 1.0770 Queensland Alumina Ltd (Gladstone South) 132 QQAH 0.9565 0.9829 Queensland Nickel (Yabulu) 132 QQNH 1.0344 1.0735 Ragian 275 QRGL 0.9427 0.9686 Redbank Plains 11 QRN 1.0034 1.0173 Richlands 313 QRLD 1.0136 1.0129 Rockhampton 66 QRCC 0.9481 0.9726 Rocklands (Rail) 132 QRCK 0.9399 0.9657 Rocklands (Rail) 132 QRCK 0.9399 0.9657 Rocklands (Rail) 132 QRCK 0.9399 0.9657 Rocklands (Archerfield) 110 QRCK 1.0052 1.0652 Runcorn 33 QRTS 1.0044 1.0052 South Pine </td <td>Pandoin</td> <td>132</td> <td>QPAN</td> <td>0.9461</td> <td>0.9699</td> <td></td>	Pandoin	132	QPAN	0.9461	0.9699	
Pioneer Valley 66 QPIV 1.060 1.0487 Proserpine 66 QPRO 1.0439 1.0770 Queensland Alumina Ltd (Gladstone South) 132 QQAH 0.9565 0.9829 Queensland Nickel (Yabulu) 132 QQNH 1.0344 1.0735 Raglan 275 QRGL 0.9427 0.9686 Redbank Plains 11 QRPN 1.0030 1.0007 Richlands 33 QRCK 0.9399 0.9657 Rocklands (Rail) 132 QRCK 0.9399 0.9657 Rocklands (Rail) 132 QRCK 0.9399 0.9657 Rocklands (Rail) 132 QRCS 1.0292 1.0667 Runcorn 33 QRBS 1.0161 1.0150 South Pine 110 QSVC 1.0292 1.0667 Summer 110 QSVC 1.0298 1.0449 Summer 110 QSVC 1.0298 1.0491 Tarong 66 <	Pandoin	66	QPAL	0.9457	0.9700	
Proserpine 66 QPRO 1.0439 1.0770 Queensland Alumina Ltd (Gladstone South) 132 QQAH 0.9565 0.9829 Queensland Nickel (Yabulu) 132 QQNH 1.0344 1.0735 Raglan 275 QRGL 0.9427 0.9686 Redbank Plains 11 QRPN 1.0030 1.0007 Richlands 33 QRLD 1.0136 1.0129 Rocklands (Rail) 132 QRCK 0.9999 0.9657 Rockland (Archerfield) 1101 QRLE 1.0059 1.052 Ross 132 QRCS 1.0292 1.0667 Runcorn 33 QRBS 1.0161 1.0150 South Pine 110 QSYN 1.0449 1.049 Sumer 1	Peak Downs (Rail)	132	QPKD	1.0280	1.0672	
Queensland Alumina Ltd (Gladstone South) 132 QQAH 0.9565 0.9829 Queensland Nickel (Yabulu) 132 QQNH 1.0344 1.075 Raglan 275 QRGL 0.9427 0.9686 Redbank Plains 111 QRPN 1.0007 1.0007 Richlands 33 QRLD 1.0136 1.0129 Rockhampton 66 QRCC 0.9481 0.9726 Rocklands (Rail) 132 QRCK 0.9399 0.9657 Rocklands (Kail) 132 QRCK 0.9399 0.9657 Rocklands (Acherfield) 110 QRLE 1.0059 1.052 Ross 132 QRCK 0.9399 0.9657 Runcorn 33 QRLD 1.0059 1.052 South Pine 110 QSNC 1.029 1.0449 Sumner 110 QSUM 1.0068 1.0057 Tangkam (Dalby) 1101 QTKM 0.9816 0.9717 Tarong 66	Pioneer Valley	66	QPIV	1.0060	1.0487	
South) Interface Interface Queensland Nickel (Yabulu) 132 QQNH 1.0344 1.0735 Raglan 275 QRGL 0.9427 0.9686 Redbank Plains 111 QRPN 1.0030 1.0007 Richlands 33 QRLD 1.0136 1.0129 Rockhampton 66 QRCC 0.9481 0.9726 Rocklands (Rail) 132 QRCK 0.9399 0.9657 Rocklands (Kail) 132 QRCK 0.9399 0.9657 Rocklands (Kail) 132 QRCK 1.029 1.0652 Ross 132 QRCS 1.022 1.0667 Runcorn 33 QRB 1.011 1.0159 South Pine 110 QSVC 1.029 1.0449 Summer 110 QSVC 1.029 1.0449 Summer 110 QSVC 1.029 1.0419 Tarong 66 QTK 0.9816 0.9717	Proserpine	66	QPRO	1.0439	1.0770	
Raglan 275 QRGL 0.9427 0.9686 Redbank Plains 11 QRPN 1.0030 1.0007 Richlands 33 QRLD 1.0136 1.0129 Rockhampton 66 QROC 0.9481 0.9726 Rocklands (Rail) 132 QRCK 0.9399 0.9657 Rocklea (Archerfield) 110 QRLE 1.0059 1.052 Ross 132 QROS 1.0292 1.0667 Runcom 33 QRBS 1.0144 1.0049 South Pine 110 QSYC 1.0289 1.0449 Stony Creek 132 QSYC 1.0289 1.0449 Sumner 110 QSUM 1.0068 1.0057 Tangkam (Dalby) 110 QTKM 0.9816 0.9717 Tarong 66 QTRL 0.975 1.033 Tennyson (Rail) 110 QTNN 1.0085 1.0082 Townsville South 66 QTVE 1.0373	Queensland Alumina Ltd (Gladstone South)	132	QQAH	0.9565	0.9829	
Redbank Plains 11 QRPN 1.0030 1.007 Richlands 33 QRLD 1.0136 1.0129 Rockhampton 66 QROC 0.9481 0.9726 Rocklands (Rail) 132 QRCK 0.9399 0.9657 Rocklands (Rail) 110 QRLE 1.0059 1.0052 Ross 132 QROS 1.0292 1.0667 Runcorn 33 QRBS 1.0161 1.0150 South Pine 110 QSVC 1.0289 1.0449 Stony Creek 132 QSYC 1.0289 1.0449 Sumner 110 QSUM 1.0044 1.0049 Targkam (Dalby) 1101 QSWC 1.0289 1.0449 Targeng 66 QTRL 0.9816 0.9717 Tarking (Dalby) 110 QTKM 0.98816 1.00591 Tenenyson (Rail) 110 QTNN 1.0085 1.0082 Townsville South 66 QTVE 1	Queensland Nickel (Yabulu)	132	QQNH	1.0344	1.0735	
Richlands 33 ORLD 1.0136 1.0129 Rockhampton 66 QROC 0.9481 0.9726 Rocklands (Rail) 132 QRCK 0.9399 0.9657 Rocklaad (Archerfield) 110 QRLE 1.0059 1.0052 Ross 132 QROS 1.0292 1.0667 Runcorn 33 QRBS 1.0161 1.0150 South Pine 110 QSPN 1.044 1.0049 Stony Creek 132 QSYC 1.0289 1.0449 Sumner 110 QSUM 1.0068 1.0057 Tangkam (Dalby) 1101 QTKM 0.9816 0.9717 Tarong 66 QTRL 0.9715 0.9691 Teebar Creek 132 QTBC 0.9870 1.0033 Tennyson (Rail) 110 QTNN 1.0055 1.0052 Townsville East 66 QTVE 1.0373 1.0774 Turkinje (Craiglee) 132 QTUH <	Raglan	275	QRGL	0.9427	0.9686	
Rockhampton 66 QROC 0.9481 0.9726 Rocklands (Rail) 132 QRCK 0.9399 0.9657 Rocklaa (Archerfield) 110 QRLE 1.0059 1.0052 Ross 132 QROS 1.0292 1.0667 Runcorn 33 QRBS 1.011 1.0150 South Pine 110 QSPN 1.044 1.0049 Stony Creek 132 QSYC 1.0289 1.0449 Sumner 110 QSUM 1.0068 1.0057 Tangkam (Dalby) 110 QTKM 0.9816 0.9717 Tarong 66 QTRL 0.9715 0.9691 Teebar Creek 132 QTBC 0.9870 1.0033 Tennyson (Rail) 110 QTNN 1.0055 1.0082 Townsville South (KZ) 132 QTUE 1.0763 1.0763 Townsville South (KZ) 132 QTUE 1.0763 1.0764 Turkinje (Craiglee) 132 QT	Redbank Plains	11	QRPN	1.0030	1.0007	
Rocklands (Rail) 132 QRCK 0.9399 0.9657 Rocklaa (Archerfield) 110 QRLE 1.0059 1.0052 Ross 132 QROS 1.0292 1.0667 Runcorn 33 QRBS 1.0161 1.0150 South Pine 110 QSPN 1.044 1.0049 Stony Creek 132 QSYC 1.0289 1.0449 Sumner 110 QSUM 1.0068 1.0057 Tangkam (Dalby) 110 QTKM 0.9816 0.9717 Tarong 66 QTRL 0.9715 0.9691 Teebar Creek 132 QTBC 0.9870 1.003 Tennyson (Rail) 110 QTNN 1.0085 1.0082 Townsville East 66 QTVE 1.0373 1.0774 Townsville South (KZ) 132 QTLL 1.075 1.1103 Turkinje (Craiglee) 132 QTUH 1.0625 1.1103 Wandoan South (NW Surat) 275	Richlands	33	QRLD	1.0136	1.0129	
Rocklea (Archerfield) 110 QRLE 1.0059 1.0052 Ross 132 QROS 1.0292 1.0667 Runcorn 33 QRBS 1.0111 1.0150 South Pine 100 QSPN 1.0044 1.0049 Stony Creek 132 QSYC 1.0289 1.0449 Sumner 100 QSUM 1.0068 1.0057 Tangkam (Dalby) 1010 QTKM 0.9816 0.9717 Tarong 66 QTRL 0.9715 0.9691 Teebar Creek 132 QTBC 0.9870 1.0033 Tennyson (Rail) 110 QTNN 1.0055 1.0062 Townsville East 66 QTVE 1.0373 1.0764 Tully 222 QTLL 1.0779 1.1188 Turkinje (Craiglee) 132 QTWH 1.0827 1.1077 Wandoan South (NW Surat) 275 QWST 0.9846 0.9800 Wandoo (Raii) 132 QWAN	Rockhampton	66	QROC	0.9481	0.9726	
Ross 132 QROS 1.0292 1.0667 Runcorn 33 QRBS 1.0161 1.0150 South Pine 110 QSPN 1.0044 1.0049 Stony Creek 132 QSYC 1.0289 1.0449 Sumner 110 QSUM 1.068 1.0057 Tangkam (Dalby) 110 QTKM 0.9816 0.9717 Tarong 66 QTRL 0.9870 1.0033 Teebar Creek 132 QTBC 0.9870 1.0033 Tennyson (Rail) 110 QTNN 1.0085 1.0082 Townsville East 66 QTVE 1.0337 1.0763 Tuly 22 QTLL 1.0773 1.0765 Tully 22 QTLL 1.0779 1.1188 Turkinje (Craiglee) 132 QWSH 0.9854 0.9810 Wandoan South (NW Surat) 275 QWST 0.9846 0.9800 Wandoo (Rail) 132 QWAN 0.9897 <td>Rocklands (Rail)</td> <td>132</td> <td>QRCK</td> <td>0.9399</td> <td>0.9657</td> <td></td>	Rocklands (Rail)	132	QRCK	0.9399	0.9657	
Runcorn33QRBS1.01611.0150South Pine110QSPN1.00441.0049Stony Creek132QSYC1.02891.0449Sumner110QSUM1.00681.0057Tangkam (Dalby)1100QTKM0.98160.9717Tarong66QTRL0.98701.0033Teebar Creek132QTBC0.98701.0033Tennyson (Rail)110QTNN1.00851.0082Townsville East66QTVE1.03371.0763Tully22QTLL1.07791.1188Turkinje (Craiglee)132QTWH1.07621.1077Wandoan South (NW Surat)275QWST0.98870.9800Wandoo (Rail)132QWAN0.98971.0236Wivenhoe Pump275QWIP0.98550.9940Woolooga (Energex)132QWLG0.98500.9984	Rocklea (Archerfield)	110	QRLE	1.0059	1.0052	
South Pine 110 QSPN 1.0044 1.0049 Stony Creek 132 QSYC 1.0289 1.0449 Sumner 110 QSUM 1.0068 1.0057 Tangkam (Dalby) 110 QTKM 0.9816 0.9717 Tarong 66 QTRL 0.9870 1.0033 Tendear Creek 132 QTBC 0.9870 1.0033 Tennyson 33 QTNS 1.0100 1.0100 Tennyson (Rail) 110 QTNN 1.085 1.082 Townsville East 66 QTVE 1.0373 1.074 Townsville South (KZ) 132 QTZS 1.0419 1.0765 Tully 22 QTLL 1.077 1.1188 Turkinje (Craiglee) 132 QTWH 1.0762 1.1077 Wandoan South (NW Surat) 275 QWSH 0.9846 0.9800 Wandoo (Rail) 132 QWAN 0.9877 1.0236 Wandoo Rail) 132 QWAN <td>Ross</td> <td>132</td> <td>QROS</td> <td>1.0292</td> <td>1.0667</td> <td></td>	Ross	132	QROS	1.0292	1.0667	
Stony Creek 132 QSYC 1.0289 1.0449 Sumner 110 QSUM 1.0068 1.0057 Tangkam (Dalby) 110 QTKM 0.9816 0.9717 Tarong 66 QTRL 0.9715 0.9691 Teebar Creek 132 QTBC 0.9870 1.0033 Tennyson 33 QTNS 1.0100 1.0100 Tennyson (Rail) 110 QTNN 1.0685 1.0082 Townsville East 66 QTVE 1.0373 1.0763 Townsville South (KZ) 132 QTZS 1.0419 1.0765 Tully 22 QTLL 1.0779 1.1188 Turkinje (Craiglee) 132 QTWH 1.0762 1.1077 Wandoan South (NW Surat) 275 QWSH 0.9854 0.9810 Wandoo (Rail) 132 QWAN 0.9875 0.9400 Wandoo (Rail) 275 QWIP 0.975 0.940	Runcorn	33	QRBS	1.0161	1.0150	
Summer 110 QSUM 1.0068 1.0057 Tangkam (Dalby) 110 QTKM 0.9816 0.9717 Tarong 66 QTRL 0.9715 0.9691 Teebar Creek 132 QTBC 0.9870 1.0033 Tennyson 33 QTNS 1.0100 1.0100 Tennyson (Rail) 110 QTNN 1.0085 1.0082 Townsville East 66 QTVE 1.0337 1.0763 Townsville South 66 QTVS 1.0373 1.0774 Townsville South (KZ) 132 QTZS 1.0419 1.0765 Tully 22 QTLL 1.0779 1.1188 Turkinje 66 QTUH 1.0762 1.1077 Wandoan South 132 QWSH 0.9854 0.9810 Wandoan South (NW Surat) 275 QWST 0.9846 0.9800 Wandoo (Raii) 132 QWAN 0.9897 1.0236 Wivenhoe Pump 275 QWIP <td>South Pine</td> <td>110</td> <td>QSPN</td> <td>1.0044</td> <td>1.0049</td> <td></td>	South Pine	110	QSPN	1.0044	1.0049	
Tangkam (Dalby)110QTKM0.98160.9717Tarong66QTRL0.97150.9691Teebar Creek132QTBC0.98701.0033Tennyson33QTNS1.01001.0100Tennyson (Rail)110QTNN1.08551.082Townsville East66QTVE1.03731.0763Townsville South66QTVS1.03731.0774Townsville South (KZ)132QTLL1.07791.1188Turkinje66QTUL1.08771.1103Turkinje (Craiglee)132QTUH1.07621.1077Wandoan South (NW Surat)275QWST0.98460.9800Wandoo (Rail)132QWAN0.98971.0236Wivenhoe Pump275QWIP0.99750.9940Woolooga (Energex)132QWLG0.98500.9844	Stony Creek	132	QSYC	1.0289	1.0449	
Tarong 66 QTRL 0.9715 0.9691 Teebar Creek 132 QTBC 0.9870 1.0033 Tennyson 33 QTNS 1.0100 1.0100 Tennyson (Rail) 110 QTNN 1.0085 1.0082 Townsville East 66 QTVE 1.0367 1.0763 Townsville South 66 QTVS 1.0373 1.0774 Townsville South (KZ) 132 QTZS 1.0419 1.0765 Tully 22 QTLL 1.0779 1.1188 Turkinje (Craiglee) 132 QTUH 1.0762 1.1077 Wandoan South (NW Surat) 275 QWSH 0.9854 0.9800 Wandoo (Rail) 132 QWAN 0.9897 1.0236 Wivenhoe Pump 275 QWIP 0.9975 0.9940 Woolooga (Energex) 132 QWLG 0.9850 0.9844	Sumner	110	QSUM	1.0068	1.0057	
Teebar Creek 132 QTBC 0.9870 1.0033 Tennyson 33 QTNS 1.0100 1.0100 Tennyson (Rail) 110 QTNN 1.0085 1.0082 Townsville East 66 QTVE 1.0373 1.0763 Townsville South 66 QTVS 1.0373 1.0763 Townsville South (KZ) 132 QTZS 1.0419 1.0765 Tully 22 QTLL 1.0779 1.1188 Turkinje (Craiglee) 132 QTUH 1.0762 1.107 Wandoan South (NW Surat) 275 QWSH 0.9846 0.9800 Wandoo (Rail) 132 QWAN 0.9897 1.0236 Wivenhoe Pump 275 QWIP 0.9975 0.9940	Tangkam (Dalby)	110	QTKM	0.9816	0.9717	
Tennyson 33 QTNS 1.0100 1.0100 Tennyson (Rail) 110 QTNN 1.0085 1.0082 Townsville East 66 QTVE 1.0367 1.0763 Townsville South 66 QTVS 1.0373 1.0774 Townsville South (KZ) 132 QTZS 1.0419 1.0765 Tully 22 QTLL 1.0779 1.1103 Turkinje (Craiglee) 132 QTUH 1.0762 1.1077 Wandoan South (NW Surat) 275 QWSH 0.9846 0.9800 Wandoo (Rail) 132 QWIP 0.9975 0.9940 Wivenhoe Pump 275 QWIE 0.9850 0.9984	Tarong	66	QTRL	0.9715	0.9691	
Tennyson (Rail)110QTNN1.00851.0082Townsville East66QTVE1.03671.0763Townsville South66QTVS1.03731.0774Townsville South (KZ)132QTZS1.04191.0765Tully22QTLL1.07791.1188Turkinje (Craiglee)132QTUH1.07621.1077Wandoan South (NW Surat)275QWSH0.98460.9800Wivenhoe Pump275QWIP0.99750.9940Woolooga (Energex)132QWLG0.98500.9984	Teebar Creek	132	QTBC	0.9870	1.0033	
Townsville East 66 QTVE 1.0367 1.0763 Townsville South 66 QTVS 1.0373 1.0774 Townsville South (KZ) 132 QTZS 1.0419 1.0765 Tully 22 QTLL 1.0779 1.1188 Turkinje 66 QTUL 1.0762 1.1077 Turkinje (Craiglee) 132 QTUH 1.0762 1.1077 Wandoan South (NW Surat) 275 QWSH 0.9854 0.9800 Wandoo (Rail) 132 QWAN 0.9897 1.0236 Wivenhoe Pump 275 QWIP 0.9975 0.9940 Woolooga (Energex) 132 QWLG 0.9850 0.9844	Tennyson	33	QTNS	1.0100	1.0100	
Townsville South1.03731.0774Townsville South (KZ)132QTZS1.04191.0765Tully22QTLL1.07791.1188Turkinje66QTUL1.08771.1103Turkinje (Craiglee)132QWSH0.98540.9810Wandoan South (NW Surat)275QWST0.98460.9800Wandoo (Rail)132QWLP0.98751.0236Wivenhoe Pump275QWLP0.98500.9840Woolooga (Energex)132QWLG0.98500.9844	Tennyson (Rail)	110	QTNN	1.0085	1.0082	
Townsville South (KZ) 132 QTZS 1.0419 1.0765 Tully 22 QTLL 1.0779 1.1188 Turkinje 66 QTUL 1.0877 1.1103 Turkinje (Craiglee) 132 QTUH 1.0762 1.107 Wandoan South 132 QWSH 0.9854 0.9810 Wandoan South (NW Surat) 275 QWST 0.9846 0.9800 Wandoo (Rail) 132 QWAN 0.9897 1.0236 Wivenhoe Pump 275 QWIP 0.9975 0.9940 Woolooga (Energex) 132 QWLG 0.9850 0.9984	Townsville East	66	QTVE	1.0367	1.0763	
Tully22QTLL1.07791.1188Turkinje66QTUL1.08771.1103Turkinje (Craiglee)132QTUH1.07621.1077Wandoan South132QWSH0.98540.9810Wandoan South (NW Surat)275QWST0.98460.9800Wandoo (Rail)132QWAN0.98971.0236Wivenhoe Pump275QWIP0.99750.9940Woolooga (Energex)132QWLG0.98500.9844	Townsville South	66	QTVS	1.0373	1.0774	
Turkinje66QTUL1.08771.1103Turkinje (Craiglee)132QTUH1.07621.1077Wandoan South132QWSH0.98540.9810Wandoan South (NW Surat)275QWST0.98460.9800Wandoo (Rail)132QWAN0.98971.0236Wivenhoe Pump275QWIP0.99750.9940Woolooga (Energex)132QWLG0.98500.9844	Townsville South (KZ)	132	QTZS	1.0419	1.0765	
Turkinje (Craiglee) 132 QTUH 1.0762 1.1077 Wandoan South 132 QWSH 0.9854 0.9810 Wandoan South (NW Surat) 275 QWST 0.9846 0.9800 Wandoo (Rail) 132 QWAN 0.9897 1.0236 Wivenhoe Pump 275 QWIP 0.9975 0.9940 Woolooga (Energex) 132 QWLG 0.9850 0.9984	Tully	22	QTLL	1.0779	1.1188	
Wandoan South 132 QWSH 0.9854 0.9810 Wandoan South (NW Surat) 275 QWST 0.9846 0.9800 Wandoo (Rail) 132 QWAN 0.9897 1.0236 Wivenhoe Pump 275 QWIP 0.9975 0.9940 Woolooga (Energex) 132 QWLG 0.9850 0.9984	Turkinje	66	QTUL	1.0877	1.1103	
Wandoan South (NW Surat) 275 QWST 0.9846 0.9800 Wandoo (Rail) 132 QWAN 0.9897 1.0236 Wivenhoe Pump 275 QWIP 0.9975 0.9940 Woolooga (Energex) 132 QWLG 0.9850 0.9984	Turkinje (Craiglee)	132	QTUH	1.0762	1.1077	
Wandoo (Rail) 132 QWAN 0.9897 1.0236 Wivenhoe Pump 275 QWIP 0.9975 0.9940 Woolooga (Energex) 132 QWLG 0.9850 0.9984	Wandoan South	132	QWSH	0.9854	0.9810	
Wivenhoe Pump 275 QWIP 0.9975 0.9940 Woolooga (Energex) 132 QWLG 0.9850 0.9984	Wandoan South (NW Surat)	275	QWST	0.9846	0.9800	
Woolooga (Energex) 132 QWLG 0.9850 0.9984	Wandoo (Rail)	132	QWAN	0.9897	1.0236	
	Wivenhoe Pump	275	QWIP	0.9975	0.9940	
Woolooga (Ergon) 132 QWLN 0.9850 0.9984	Woolooga (Energex)	132	QWLG	0.9850	0.9984	
	Woolooga (Ergon)	132	QWLN	0.9850	0.9984	



Location	Voltage (kV)	TNI	2017-18 MLF	2016-17 MLF	Remark
Woree	132	QWRE	1.0541	1.0887	
Wotonga (Rail)	132	QWOT	1.0290	1.0616	
Wycarbah	132	QWCB	0.9351	0.9585	
Yarwun – Boat Creek (Ergon)	132	QYAE	0.9478	0.9717	
Yarwun – Rio Tinto	132	QYAR	0.9461	0.9716	

Table 2 Queensland Generation

Location	Voltage (kV)	DUID	Connection Point ID	TNI	2017-18 MLF	2016-17 MLF	Remark
Barron Gorge PS Unit 1	132	BARRON-1	QBGH1	QBGH	1.0238	1.0530	
Barron Gorge PS Unit 2	132	BARRON-2	QBGH2	QBGH	1.0238	1.0530	
Braemar PS Unit 1	275	BRAEMAR1	QBRA1	QBRA	0.9607	0.9549	
Braemar PS Unit 2	275	BRAEMAR2	QBRA2	QBRA	0.9607	0.9549	
Braemar PS Unit 3	275	BRAEMAR3	QBRA3	QBRA	0.9607	0.9549	
Braemar Stage 2 PS Unit 5	275	BRAEMAR5	QBRA5B	QBRA	0.9607	0.9549	
Braemar Stage 2 PS Unit 6	275	BRAEMAR6	QBRA6B	QBRA	0.9607	0.9549	
Braemar Stage 2 PS Unit 7	275	BRAEMAR7	QBRA7B	QBRA	0.9607	0.9549	
Callide PS Load	132	CALLNL1	QCAX	QCAX	0.9146	0.9344	
Callide A PS Unit 4	132	CALL_A_4	QCAA4	QCAA	0.9161	0.9268	
Callide A PS Unit 4 Load	132	CALLNL4	QCAA2	QCAA	0.9161	0.9268	
Callide B PS Unit 1	275	CALL_B_1	QCAB1	QCAB	0.9235	0.9456	
Callide B PS Unit 2	275	CALL_B_2	QCAB2	QCAB	0.9235	0.9456	
Callide C PS Unit 3	275	CPP_3	QCAC3	QCAC	0.9211	0.9410	
Callide C PS Unit 4	275	CPP_4	QCAC4	QCAC	0.9211	0.9410	
Condamine PS	132	CPSA	QCND1C	QCND	0.9688	0.9685	
Darling Downs PS	275	DDPS1	QBRA8D	QBRA	0.9607	0.9549	
Gladstone PS (132 kV) Unit 3	132	GSTONE3	QGLD3	QGLL	0.9402	0.9603	
Gladstone PS (132 kV) Unit 4	132	GSTONE4	QGLD4	QGLL	0.9402	0.9603	
Gladstone PS (132kV) Load	132	GLADNL1	QGLL	QGLL	0.9402	0.9603	
Gladstone PS (275 kV) Unit 1	275	GSTONE1	QGLD1	QGLH	0.9431	0.9662	
Gladstone PS (275 kV) Unit 2	275	GSTONE2	QGLD2	QGLH	0.9431	0.9662	
Gladstone PS (275 kV) Unit 5	275	GSTONE5	QGLD5	QGLH	0.9431	0.9662	
Gladstone PS (275 kV) Unit 6	275	GSTONE6	QGLD6	QGLH	0.9431	0.9662	
Grosvenor PS	66	GROSV1	QMRN2G	QMRV	1.0252		Effective from 27/09/2017
Grosvenor PS No2	66	GROSV2	QMRV1G	QMRV	1.0252		Effective from 27/09/2017
Kareeya PS Unit 1	132	KAREEYA1	QKAH1	QKYH	1.0181	1.0495	



Kareeya PS Unit 2	132	KAREEYA2	QKAH2	QKYH	1.0181	1.0495	
Kareeya PS Unit 3	132	KAREEYA3	QKAH3	QKYH	1.0181	1.0495	
Kareeya PS Unit 4	132	KAREEYA4	QKAH4	QKYH	1.0181	1.0495	
Kogan Creek PS	275	KPP_1	QBRA4K	QWDN	0.9635	0.9588	
Koombooloomba	132	KAREEYA5	QKYH5	QKYH	1.0181	1.0495	
Millmerran PS Unit 1	330	MPP_1	QBCK1	QMLN	0.9737	0.9642	
Millmerran PS Unit 2	330	MPP_2	QBCK2	QMLN	0.9737	0.9642	
Mt Stuart PS Unit 1	132	MSTUART1	QMSP1	QMSP	0.9964	0.9834	
Mt Stuart PS Unit 2	132	MSTUART2	QMSP2	QMSP	0.9964	0.9834	
Mt Stuart PS Unit 3	132	MSTUART3	QMSP3M	QMSP	0.9964	0.9834	
Oakey PS Unit 1	110	OAKEY1	QOKY1	QOKY	0.9667	0.9420	
Oakey PS Unit 2	110	OAKEY2	QOKY2	QOKY	0.9667	0.9420	
Stanwell PS Load	132	STANNL1	QSTX	QSTX	0.9366	0.9618	
Stanwell PS Unit 1	275	STAN-1	QSTN1	QSTN	0.9329	0.9561	
Stanwell PS Unit 2	275	STAN-2	QSTN2	QSTN	0.9329	0.9561	
Stanwell PS Unit 3	275	STAN-3	QSTN3	QSTN	0.9329	0.9561	
Stanwell PS Unit 4	275	STAN-4	QSTN4	QSTN	0.9329	0.9561	
Swanbank E GT	275	SWAN_E	QSWE	QSWE	1.0019	0.9984	
Tarong North PS	275	TNPS1	QTNT	QTNT	0.9713	0.9678	
Tarong PS Unit 1	275	TARONG#1	QTRN1	QTRN	0.9712	0.9686	
Tarong PS Unit 2	275	TARONG#2	QTRN2	QTRN	0.9712	0.9686	
Tarong PS Unit 3	275	TARONG#3	QTRN3	QTRN	0.9712	0.9686	
Tarong PS Unit 4	275	TARONG#4	QTRN4	QTRN	0.9712	0.9686	
Staplyton	110	STAPYLTON1	QLGH4S	QLGH	1.0112		Effective from 18/07/2017
Wivenhoe Generation Unit 1	275	W/HOE#1	QWIV1	QWIV	0.9935	0.9902	
Wivenhoe Generation Unit 2	275	W/HOE#2	QWIV2	QWIV	0.9935	0.9902	
Wivenhoe Pump 1	275	PUMP1	QWIP1	QWIP	0.9975	0.9940	
Wivenhoe Pump 2	275	PUMP2	QWIP2	QWIP	0.9975	0.9940	
Yabulu PS	132	YABULU	QTYP	QTYP	1.0035	1.0073	
Yarwun PS	132	YARWUN_1	QYAG1R	QYAG	0.9435	0.9693	

Table 3 Queensland Embedded Generation

Location	Voltage (kV)	DUID	Connection Point ID	TNI	2017-18 MLF	2016-17 MLF
Barcaldine PS - Lilyvale	132	BARCALDN	QBCG	QBCG	0.9507	0.9777
Barcaldine Solar - Lilyvale	132	BARCSF1	QLLV1B	QLLV	0.9715	1.0107
Browns Plains Landfill Gas PS	110	BPLANDF1	QLGH3B	QLGH	1.0112	1.0080



Daandine PS	110	DAANDINE	QTKM1	QTKM	0.9816	0.9717
German Creek Generator	66	GERMCRK	QLIL2	QLIL	0.9808	1.0122
Grosvenor PS At Moranbah 66	66	GROSV1	QMRN2G	QMRV	1.0320	1.0727
Isis CSM	132	ICSM	QGNG1I	QTBC	0.9870	1.0033
Mackay GT	33	MACKAYGT	QMKG	QMKG	0.9577	0.9737
Moranbah Gen	11	MORANBAH	QMRL1M	QMRL	1.0441	1.0526
Moranbah North PS	66	MBAHNTH	QMRN1P	QMRN	1.0364	1.0721
Oaky Creek Generator	66	OAKYCREK	QLIL1	QLIL	0.9808	1.0122
Oaky Creek 2	66	OAKY2	QLIL3O	QLIL	0.9808	1.0122
Racecourse Mill PS 1 - 3	66	RACOMIL1	QMKA1R	QPIV	1.0060	1.0487
Rochedale Renewable Energy Plant	110	ROCHEDAL	QBMH2	QBMH	1.0114	1.0091
Rocky Point Gen (Loganlea 110kV)	110	RPCG	QLGH2	QLGH	1.0112	1.0080
Roghan Road Generator	110	EDLRGNRD	QSPN2	QSPN	1.0044	1.0049
Roma PS Unit 7 - Columboola	132	ROMA_7	QRMA7	QRMA	0.9623	0.9629
Roma PS Unit 8 - Columboola	132	ROMA_8	QRMA8	QRMA	0.9623	0.9629
Southbank Institute Of Technology	110	STHBKTEC	QCBD1S	QCBW	1.0129	1.0125
Ti Tree BioReactor	33	TITREE	QABM1T	QABM	1.0016	0.9990
Whitwood Rd Renewable Energy Plant	110	WHIT1	QSBK1	QBKS	0.9999	0.9968
Windy Hill WF	66	WHILL1	QTUL	QTUL	1.0877	1.1103
Wivenhoe Small Hydro	110	WIVENSH	QABR1	QABR	0.9990	0.9951
Yabulu Steam Turbine (Garbutt 66kV)	66	YABULU2	QGAR1	QYST	0.9778	0.9992

1.2 NSW Marginal Loss Factors¹

Table 4 NSW Loads

Location	Voltage (kV)	TNI	2017-18 MLF	2016-17 MLF	Remark
Albury	132	NALB	1.1080	1.0305	
Alcan	132	NALC	0.9920	0.9933	
Armidale	66	NAR1	0.9020	0.9435	
Australian Newsprint Mill	132	NANM	1.1110	1.0294	
Balranald	22	NBAL	1.2097	1.1166	
Beaconsfield North	132	NBFN	1.0081	1.0078	
Beaconsfield South	132	NBFS	1.0081	1.0078	
Beaconsfield West	132	NBFW	1.0081	1.0078	

¹ The NSW region includes the ACT. ACT generation and load are detailed separately for ease of reference.



Location	Voltage (kV)	TNI	2017-18 MLF	2016-17 MLF	Remark
Belmore Park	132	NBM1	1.0082	1.0079	
Beresfield	33	NBRF	0.9947	0.9965	
Beryl	66	NBER	1.0067	1.0145	
BHP (Waratah)	132	NWR1	0.9886	0.9898	
Boambee South	132	NWST	0.9190	0.9680	
Boggabri East	132	NBGE	0.9677	1.0022	
Boggabri North	132	NBGN	0.9694	1.0056	
Brandy Hill	11	NBHL	0.9924	0.9941	
Broken Hill	22	NBKG	1.2841	1.1714	
Broken Hill	220	NBKH	1.2757	1.1632	
Bunnerong	132	NBG1	1.0080	1.0076	
Bunnerong	33	NBG3	1.0099	1.0097	
Burrinjuck	132	NBU2	1.0324	1.0045	
Canterbury	33	NCTB	1.0135	1.0134	
Carlingford	132	NCAR	1.0041	1.0035	
Casino	132	NCSN	0.9021	0.9648	
Charmhaven	11	NCHM	0.9925	0.9935	
Chullora	132	NCHU	1.0076	1.0077	
Coffs Harbour	66	NCH1	0.9139	0.9634	
Coleambally	132	NCLY	1.1222	1.0477	
Cooma	66	NCMA	1.0387	1.0106	
Cooma (AusNet Services)	66	NCM2	1.0387	1.0106	
Croydon	11	NCRD	1.0113	1.0104	
Cowra	66	NCW8	1.0435	1.0355	
Dapto (Endeavour Energy)	132	NDT1	1.0023	0.9986	
Dapto (Essential Energy)	132	NDT2	1.0023	0.9986	
Darlington Point	132	NDNT	1.1114	1.0470	
Deniliquin	66	NDN7	1.1400	1.0715	
Dorrigo	132	NDOR	0.9116	0.9568	
Drummoyne	11	NDRM	1.0090	1.0090	
Dunoon	132	NDUN	0.8881	0.9553	
Far North VTN		NEV1	0.9632	0.9745	
Finley	66	NFNY	1.1256	1.0825	
Forbes	66	NFB2	1.0551	1.0535	
Gadara	132	NGAD	1.0756	1.0328	
Glen Innes	66	NGLN	0.9000	0.9696	
Gosford	66	NGF3	1.0008	1.0015	
Gosford	33	NGSF	1.0014	1.0021	
Green Square	11	NGSQ	1.0094	1.0081	
Griffith	33	NGRF	1.1321	1.0665	
Gunnedah	66	NGN2	0.9592	0.9879	
Haymarket	132	NHYM	1.0082	1.0079	
Heron's Creek	132	NHNC	0.9921	1.0226	
Holroyd	132	NHLD	0.9998	1.0001	



Location	Voltage (kV)	TNI	2017-18 MLF	2016-17 MLF	Remark
Hurstville North	11	NHVN	1.0068	1.0063	
Homebush Bay	11	NHBB	1.0112	1.0112	
llford	132	NLFD	0.9868	0.9928	
Ingleburn	66	NING	1.0001	1.0005	
Inverell	66	NNVL	0.9127	0.9823	
Kemps Creek	330	NKCK	0.9965	0.9957	
Kempsey	66	NKS2	0.9572	0.9976	
Kempsey	33	NKS3	0.9600	1.0006	
Koolkhan	66	NKL6	0.9255	0.9776	
Kurnell	132	NKN1	1.0055	1.0052	
Kogarah	11	NKOG	1.0120	1.0086	
Kurri	33	NKU3	0.9951	0.9967	
Kurri	11	NKU1	0.9932	0.9932	
Kurri	132	NKUR	0.9930	0.9941	
Lake Munmorah	132	NMUN	0.9810	0.9791	
Lane Cove	132	NLCV	1.0088	1.0086	
Leichhardt Zone SS (Ausgrid)	11	NLDT	1.0106		Effective from 04/10/2017
Liddell	33	NLD3	0.9582	0.9679	
Lismore	132	NLS2	0.9051	0.9661	
Liverpool	132	NLP1	1.0022	1.0019	
Macarthur	132	NMC1	0.9972	0.9953	
Macarthur	66	NMC2	0.9998	0.9986	
Macksville	132	NMCV	0.9362	0.9824	
Macquarie Park	11	NMQP	1.0123	1.0116	
Manildra	132	NMLD	1.0346	1.0410	
Marrickville	11	NMKV	1.0136	1.0132	
Marulan (Endeavour Energy)	132	NMR1	0.9998	0.9922	
Marulan (Essential Energy)	132	NMR2	0.9998	0.9922	
Mason Park	132	NMPK	1.0086	1.0087	
Meadowbank	11	NMBK	1.0120	1.0117	
Molong	132	NMOL	1.0303	1.0359	
Moree	66	NMRE	0.9479	1.0039	
Morven	132	NMVN	1.1004	1.0316	
Mt Piper	66	NMP6	0.9713	0.9765	
Mudgee	132	NMDG	1.0026	1.0095	
Mullumbimby	11	NML1	0.8710	0.9494	
Mullumbimby	132	NMLB	0.8644	0.9403	
Munmorah STS 33	33	NMU3	0.9969	0.9895	
Munmorah	330	NMN1	0.9875	0.9882	
Munyang	11	NMY1	1.0426	1.0148	
Munyang	33	NMYG	1.0426	1.0148	
Murrumbateman	132	NMBM	1.0179	1.0009	
Murrumburrah	66	NMRU	1.0596	1.0245	



Location	Voltage (kV)	TNI	2017-18 MLF	2016-17 MLF	Remark
Muswellbrook	132	NMRK	0.9637	0.9754	
Nambucca Heads	132	NNAM	0.9307	0.9773	
Narrabri	66	NNB2	0.9746	1.0154	
Newcastle	132	NNEW	0.9892	0.9907	
North of Broken Bay VTN		NEV2	0.9926	0.9937	
Orange	66	NRGE	1.0363	1.0450	
Orange	132	NRG1	1.0374	1.0453	
Orange North	132	NONO	1.0343	1.0437	
Ourimbah	33	NORB	0.9977	0.9987	
Ourimbah	132	NOR1	0.9968	0.9976	
Ourimbah	66	NOR6	0.9967	0.9975	
Panorama	66	NPMA	1.0251	1.0292	
Parkes	66	NPK6	1.0497	1.0527	
Parkes	132	NPKS	1.0476	1.0506	
Peakhurst	33	NPHT	1.0069	1.0071	
Pt Macquarie	33	NPMQ	0.9833	1.0187	
Pyrmont	33	NPT3	1.0089	1.0085	
Pyrmont	132	NPT1	1.0084	1.0080	
Queanbeyan 132	132	NQBY	1.0555	1.0250	
Raleigh	132	NRAL	0.9223	0.9691	
Regentville	132	NRGV	0.9993	0.9991	
Rookwood Road	132	NRWR	1.0019	1.0013	
Rozelle	132	NRZH	1.0089	1.0101	
Rozelle	33	NRZL	1.0100	1.0098	
Snowy Adit	132	NSAD	1.0263	0.9741	
Somersby	11	NSMB	1.0018	1.0024	
South of Broken Bay VTN		NEV3	1.0064	1.0060	
St Peters	11	NSPT	1.0113	1.0109	
Stroud	132	NSRD	1.0010	1.0057	
Sydney East	132	NSE2	1.0048	1.0050	
Sydney North (Ausgrid)	132	NSN1	1.0015	1.0016	
Sydney North (Endeavour Energy)	132	NSN2	1.0015	1.0016	
Sydney South	132	NSYS	1.0033	1.0029	
Sydney West (Ausgrid)	132	NSW1	1.0041	1.0035	
Sydney West (Endeavour Energy)	132	NSW2	1.0041	1.0035	
Tamworth	66	NTA2	0.9372	0.9638	
Taree (Essential Energy)	132	NTR2	1.0111	1.0295	
Tenterfield	132	NTTF	0.9028	0.9705	
Terranora	110	NTNR	0.9406	0.9986	
Tomago	330	NTMG	0.9888	0.9905	
Tomago (Ausgrid)	132	NTME	0.9915	0.9923	
Tomago (Essential Energy)	132	NTMC	0.9915	0.9923	
Top Ryde	11	NTPR	1.0095	1.0094	



Location	Voltage (kV)	TNI	2017-18 MLF	2016-17 MLF	Remark
Tuggerah	132	NTG3	0.9930	0.9938	
Tumut	66	NTU2	1.0748	1.0314	
Vales Pt.	132	NVP1	0.9878	0.9883	
Vineyard	132	NVYD	0.9989	0.9991	
Wagga	66	NWG2	1.0888	1.0313	
Wagga North	132	NWGN	1.0889	1.0292	
Wagga North	66	NWG6	1.0941	1.0319	
Wallerawang (Endeavour Energy)	132	NWW6	0.9714	0.9766	
Wallerawang (Essential Energy)	132	NWW5	0.9714	0.9766	
Wallerawang 66 (Essential Energy)	66	NWW4	0.9718	0.9771	
Wallerawang 66	66	NWW7	0.9718	0.9771	
Wallerawang 330 PS Load	330	NWWP	0.9754	0.9798	
Wellington	132	NWL8	0.9831	0.9909	
West Gosford	11	NGWF	1.0024	1.0031	
Williamsdale ²	132	NWDL	1.0356	1.0090	
Williamsdale (Essential Energy)	132	NWD1	1.0382		Effective from 30/08/2017
Wyong	11	NWYG	0.9953	0.9963	
Yanco	33	NYA3	1.1197	1.0546	
Yass	66	NYS6	1.0191	1.0016	
Yass	132	NYS1	1.0135	0.9914	

Table 5 NSW Generation

Location	Voltage (kV)	DUID	Connecti on Point ID	TNI	2017-18 MLF	2016-17 MLF	Remark
Bayswater PS Unit 1	330	BW01	NBAY1	NBAY	0.9520	0.9590	
Bayswater PS Unit 2	330	BW02	NBAY2	NBAY	0.9520	0.9590	
Bayswater PS Unit 3	500	BW03	NBAY3	NBYW	0.9532	0.9603	
Bayswater PS Unit 4	500	BW04	NBAY4	NBYW	0.9532	0.9603	
Blowering	132	BLOWERN G	NBLW8	NBLW	1.0506	0.9815	
Broken Hill GT 1	22	GB01	NBKG1	NBKG	1.2841	1.1714	
Burrinjuck	132	BURRIN	NBUK	NBUK	1.0275	0.9915	
Capital Wind Farm	330	CAPTL_WF	NCWF1R	NCWF	1.0163	0.9931	
Colongra PS Unit 1	330	CG1	NCLG1D	NCLG	0.9831	0.9872	
Colongra PS Unit 2	330	CG2	NCLG2D	NCLG	0.9831	0.9872	
Colongra PS Unit 3	330	CG3	NCLG3D	NCLG	0.9831	0.9872	
Colongra PS Unit 4	330	CG4	NCLG4D	NCLG	0.9831	0.9872	
Eraring 330 PS Unit 1	330	ER01	NEPS1	NEP3	0.9820	0.9829	

² There is currently a registration process in place to replace ACA1 and NWDL TNIs by 12 new TNIs in the ActewAGL network. Royalla and Mugga Lane Solar Farms will also have separate TNIs as part of the forementioned process. The 2017-18 MLF for NWDL listed in the table above will apply from 01 July 2017 until the time when the 12 new TNIs are registered and in commercial operation. Refer to Table 7 for more information on the TNI changes.



Location	Voltage (kV)	DUID	Connecti on Point ID	TNI	2017-18 MLF	2016-17 MLF	Remark
Eraring 330 PS Unit 2	330	ER02	NEPS2	NEP3	0.9820	0.9829	
Eraring 500 PS Unit 3	500	ER03	NEPS3	NEPS	0.9846	0.9846	
Eraring 500 PS Unit 4	500	ER04	NEPS4	NEPS	0.9846	0.9846	
Eraring PS Load	500	ERNL1	NEPSL	NEPS	0.9846	0.9846	
Gullen Range Solar	330	GULLRSF1	NGUR2G	NGUR	1.0010		Effective from 15/08/2017
Gullen Range Wind Farm	330	GULLRWF1	NGUR1G	NGUR	1.0010	0.9909	
Guthega	132	GUTHEGA	NGUT8	NGUT	0.9658	0.9371	
Guthega Auxiliary Supply	11	GUTHNL1	NMY11	NMY1	1.0426	1.0148	
Hume (NSW Share)	132	HUMENSW	NHUM	NHUM	1.1055	1.0020	
Kangaroo Valley – Bendeela (Shoalhaven) Generation - dual MLF	330	SHGEN	NSHL	NSHN	0.9931	0.9904	
Kangaroo Valley (Shoalhaven) Pumps - dual MLF	330	SHPUMP	NSHP1	NSHN	1.0141	1.0100	
Liddell 330 PS Load	330	LIDDNL1	NLDPL	NLDP	0.9509	0.9593	
Liddell 330 PS Unit 1	330	LD01	NLDP1	NLDP	0.9509	0.9593	
Liddell 330 PS Unit 2	330	LD02	NLDP2	NLDP	0.9509	0.9593	
Liddell 330 PS Unit 3	330	LD03	NLDP3	NLDP	0.9509	0.9593	
Liddell 330 PS Unit 4	330	LD04	NLDP4	NLDP	0.9509	0.9593	
Lower Tumut Generation - dual MLF	330	TUMUT3	NLTS8	NLTS	1.0155	0.9897	
Lower Tumut Pipeline Auxiliary	66	TUMT3NL3	NTU2L3	NTU2	1.0748	1.0314	
Lower Tumut Pumps - dual MLF	330	SNOWYP	NLTS3	NLTS	1.0533	1.0142	
Lower Tumut T2 Auxiliary	66	TUMT3NL1	NTU2L1	NTU2	1.0748	1.0314	
Lower Tumut T4 Auxiliary	66	TUMT3NL2	NTU2L2	NTU2	1.0748	1.0314	
Mt Piper PS Load	330	MPNL1	NMPPL	NMTP	0.9725	0.9753	
Mt Piper PS Unit 1	330	MP1	NMTP1	NMTP	0.9725	0.9753	
Mt Piper PS Unit 2	330	MP2	NMTP2	NMTP	0.9725	0.9753	
Smithfield Energy Facility (Sithe)	132	SITHE01	NSYW1	NHD2	0.9979		Effective from 01/11/2017
Upper Tumut	330	UPPTUMUT	NUTS8	NUTS	1.0356	0.9943	
Uranquinty PS Unit 11	132	URANQ11	NURQ1U	NURQ	1.0087	0.9291	
Uranquinty PS Unit 12	132	URANQ12	NURQ2U	NURQ	1.0087	0.9291	
Uranquinty PS Unit 13	132	URANQ13	NURQ3U	NURQ	1.0087	0.9291	
Uranquinty PS Unit 14	132	URANQ14	NURQ4U	NURQ	1.0087	0.9291	
Vales Point 330 PS Load	330	VPNL1	NVPPL	NVPP	0.9845	0.9853	
Vales Point 330 PS Unit 5	330	VP5	NVPP5	NVPP	0.9845	0.9853	
Vales Point 330 PS Unit 6	330	VP6	NVPP6	NVPP	0.9845	0.9853	
White Rock Wind Farm	132	WRWF1	NWRK1W	NWRK	0.8468		Effective from 06/07/2017



Location	Voltage (kV)	DUID	Connecti on Point ID	TNI	2017-18 MLF	2016-17 MLF	Remark
Woodlawn Wind Farm	330	WOODLWN 1	NCWF2W	NCWF	1.0163	0.9931	

Table 6 NSW Embedded Generation

Appin PS 66 APPIA NAPP1A NAPP 1.0000 0.9986 Awaba Renewable Energy Facility 132 AWABAREF NNEW2 NNEW 0.9992 0.9007 Bankstown Sport Club 132 BANKSPT NNSY38 NSYS 1.003 1.0029 Broachwater PS 132 BWTR1 NNSY38 NSK2 0.09861 Broachwater PS 132 BWTR1 NNS12 0.0011 0.99661 Brown Mountain 66 BROWIMT NCMA1 NCMA 1.0387 1.0106 Campbelltown WSLC 66 WESTGT1 NING1C NING 0.9046 0.9986 Condong PS 110 CONDONG1 NTNR1C NTNR 0.9406 0.9986 Culerin Range Wind Farm 132 CULLRGWF NYS11 1.0135 0.9914 Culerin Range Wind Farm 132 GEMWHYD NMRK2 0.9821 0.9414 1.0035 Eastern Creek 132 GEATOREX NWYD1 NYVD 0.9994 0.9944 </th <th>Location</th> <th>Voltage (kV)</th> <th>DUID</th> <th>Connection Point ID</th> <th>TNI</th> <th>2017-18 MLF</th> <th>2016-17 MLF</th> <th>Remark</th>	Location	Voltage (kV)	DUID	Connection Point ID	TNI	2017-18 MLF	2016-17 MLF	Remark
Facility C Icc Icc Icc Icc Icc Icc Icc Bankstown Spot Club 132 BANKSPT1 NNSYS3 NSYS 1.0033 1.0029 Boco Rock Wind Farm 132 BOCORWIT NNSYS1 NSYS 1.0167 0.9882 Broadwater PS 132 BOVTR1 NNSYS1 NSYS 0.051 0.9661 Broadwater PS 132 BONGHYD NNK11 NCMA1 1.0287 1.1220 Brown Mountain 66 RCWNMT NNK11 NNK18 0.9803 0.9908 Campbelitown WSLC 66 WESTGET1 NING1C NING<1	Appin PS	66	APPIN	NAPP1A	NAPP	1.0000	0.9986	
Boco Rock Wind Farm 132 BOCORWF1 NCMA3B NBCO 1.0167 0.9882 Broadwater PS 132 BWTR1 NLS21B NLS2 0.9051 0.9661 Broken Hill Solar Farm 22 BROKENH1 NBK11B NBK1 1.2456 1.1220 Brown Mountain 66 BROWNMT NCMA1 NCMA 1.0387 1.0106 Burrendong Hydro PS 132 BDONGHYD NWL16 NING 0.9310 0.9909 Campbelltown WSLC 66 WESTCBT1 NING1C NINK1 0.9406 0.9986 Codend PS 101 CONDONG1 NTN1C NINL 0.9427 0.9423 Cullerin Range Wind Farm 132 CULLROWF NYS1C NYS1 1.0135 0.9914 Eastern Creek 132 GEBWNHYD NMRX2 NMR4 0.9327 0.9754 Glenn Innes (Pindari PS) 66 PINDARI NGLN1 NGLN1 NGLN1 0.9000 0.9696 Grange Avenue 132 GRANGEA	0,	132	AWABAREF	NNEW2	NNEW	0.9892	0.9907	
Broadwater PS 132 BWTR1 NLS21B NLS2 0.9051 0.9661 Broken Hill Solar Farm 22 BROKENH1 NBK11B NBK1 1.2456 1.1220 Brown Mountain 66 BROWNMT NCMA1 NCMA 1.0387 1.0106 Burnendong Hydro PS 132 BDONGHYD NWLB1B NWLB 0.9831 0.9909 Campbelltown WSLC 66 WESTCBT1 NING1C NINK1 0.9406 0.9986 Condong PS 110 CONDONG1 NTNR1C NINVL 0.9406 0.9986 Collerin Range Wind Farm 132 CULLRGWF NYS11C NYS1 1.035 0.9914 Eastern Creek 132 GEBWNHYD NMR2G NMRK 0.9637 0.9754 Glenbam Hydro PS 132 GEBWNHYD NMR2G NMRK 0.9309 0.9991 Gunning Wind Farm 132 GENNGEAV NVYD1 NYYD 0.9889 0.9991 Gunnam PS 66 JOUNAMA NGA2	Bankstown Sport Club	132	BANKSPT1	NSYS3R	NSYS	1.0033	1.0029	
Broken Hill Solar Farm 22 BROKENHI NBK11 NBK1 1.2456 1.1220 Brown Mountain 66 BROWNMT NCMA1 NCMA 1.0387 1.0106 Burrendong Hydro PS 132 BDONGHYD NVL81B NVL8 0.9831 0.9909 Campbelltown WSLC 66 WESTCBT1 NING1C NING 0.0406 0.9986 Condong PS 110 CONDONG1 NTNR1C NTNR 0.9406 0.9986 Collerin Range Wind Farm 132 CULLRGWF NYS11C NYS1 1.0135 0.9914 Eastern Creek 132 EASTCRK NSW21 NSW2 1.0041 1.0035 Glenbawn Hydro PS 132 GLBWNHYD NMRK2G NMRK 0.9820 0.9829 Glenn Innes (Pindar PS) 66 PINDARI NGLN NGLN 0.9000 0.9696 Grange Avene 132 GUNNING1 NYS12A NYS1 1.0135 0.9914 Jondabyne Generator 66 JOUABAM1 N	Boco Rock Wind Farm	132	BOCORWF1	NCMA3B	NBCO	1.0167	0.9882	
Brown Mountain 66 BROWINMT NCMA1 NCMA1 1.0387 1.0106 Burrendong Hydro PS 132 BDONGHYD NWL81B NWL8 0.9831 0.9909 Campbelltown WSLC 66 WESTCBT1 NING1C NING 1.0001 1.0005 Condong PS 110 CONDONG1 NTNR1C NTNR 0.9406 0.9986 Cullerin Range Wind Farm 66 COPTNHYD NNVL1C NNV 0.9127 0.9823 Cullerin Range Wind Farm 66 COPTNHYD NNVL1C NNV1 0.9124 0.9829 Glenbawn Hydro PS 132 CLULRGWF NSW21 NSW2 0.9829 0.9829 Glenbawn Hydro PS 132 GLBWNHYD NMRK2G NMRK 0.9637 0.9754 Glenn Innes (Pindari PS) 66 PINDARI NGLN1 NGLN 0.9000 0.9696 Grange Avenue 132 GUNNING1 NYS12 NVYD1 NVYD 0.9989 0.9914 Jundabyne Generator 66	Broadwater PS	132	BWTR1	NLS21B	NLS2	0.9051	0.9661	
Burrendong Hydro PS 132 BDONGHYD NWL81B NWL8 0.9831 0.9999 Campbelltown WSLC 66 WESTCBT1 NING1C NING 1.0001 1.0005 Condong PS 110 CONDONG1 NTNR1C NTNR 0.9406 0.9986 Copeton Hydro PS 66 COPTNHYD NNVL1C NNVL 0.9127 0.9823 Cullerin Range Wind Farm 132 CULLRGWF NYS11C NYS1 1.0041 1.0035 Eastern Creek 132 EASTCRK NSW21 NSW2 1.0041 1.0035 Glenbawn Hydro PS 132 GLBWNHYD NMRK2G NMRK 0.9637 0.9754 Glenn Innes (Pindari PS) 66 PINDARI NGLN1 NGLN1 0.9000 0.9696 Grange Avenue 132 GUNNING1 NYS12A NYS1 1.0135 0.9914 Jindabyne Generator 66 JOUNAMA1 NTU211 NTU2 1.0748 1.0015 Liverpol 132 (Jacks Gully) 132 JACKSGUL	Broken Hill Solar Farm	22	BROKENH1	NBK11B	NBK1	1.2456	1.1220	
Campbellown WSLC 66 WESTCBT1 NING1C NING1 1.0001 1.0005 Condong PS 110 CONDONG1 NTNR1C NTNR 0.9466 0.9986 Copeton Hydro PS 66 COPTNHYD NNVL1C NNVL 0.9127 0.9823 Cullerin Range Wind Farm 132 CULLRGWF NYS11C NYS1 1.0135 0.9914 Eastern Creek 132 EASTCRK NSW21 NSW2 1.0041 1.0035 Glenbawn Hydro PS 132 GLBWNHYD NMRK2G NMRK 0.9629 0.9629 Glenn Innes (Pindari PS) 66 PINDARI NGLN1 NGLN 0.9000 0.9696 Grange Avenue 132 GRANGEAV NVYD1 NVYD 0.9901 0.9914 Jindabyne Generator 66 JNDABNE1 NCMA2 NCMA 1.0387 1.0106 Jounama PS 66 JOUNAMA1 NTU21 NTVE 1.0038 1.0015 Liddell 33 - Hunter Valley 33 HVGTS NLD31	Brown Mountain	66	BROWNMT	NCMA1	NCMA	1.0387	1.0106	
Condong PS 110 CONDONG1 NTNR1C NTNR 0.9406 0.9986 Copeton Hydro PS 66 COPTNHYD NNVL1C NNVL 0.9127 0.9823 Cullerin Range Wind Farm 132 CULLRGWF NYS11C NYS1 1.0135 0.9914 Eastern Creek 132 EASTCRK NSW21 NSW2 1.0041 1.0035 Glenbawn Hydro PS 132 GLBWNHYD NMRK2G NMRK 0.9637 0.9754 Glenn Innes (Pindari PS) 66 PINDARI NUYD1 NVYD 0.9989 0.9991 Gunning Wind Farm 132 GRANGEAV NVYD1 NVYD 0.9989 0.9991 Gunning Wind Farm 132 GUNNING1 NYS12A NYS1 1.0135 0.9914 Jindabyne Generator 66 JOUNAMA1 NTU21J NTU2 1.0374 1.0106 Jounama PS 66 JOUNAMA1 NTU21J NTU2 1.0748 1.0015 Liddell 33 - Hunter Valley 33 HVGTS <t< td=""><td>Burrendong Hydro PS</td><td>132</td><td>BDONGHYD</td><td>NWL81B</td><td>NWL8</td><td>0.9831</td><td>0.9909</td><td></td></t<>	Burrendong Hydro PS	132	BDONGHYD	NWL81B	NWL8	0.9831	0.9909	
Copeton Hydro PS 66 COPTNHYD NNVL1C NNVL 0.9127 0.9823 Cullerin Range Wind Farm 1132 CULLRGWF NYS11C NYS1 1.0135 0.9914 Eastern Creek 1132 EASTCRK NSW21 NSW2 1.0041 1.0035 Eraring 330 BS UN (GT) 330 ERGT01 NEP35B NEP3 0.9820 0.9829 Glenbawn Hydro PS 1132 GLBWNHYD NMRK2G NMRK 0.9637 0.9754 Glenn Innes (Pindari PS) 66 PINDARI NSL14 NSLN 0.9000 0.9896 Grange Avenue 1132 GRANGEAV NVYD1 NVYD 0.9999 0.9914 Jundabyne Generator 66 JUNNING1 NYS12A NYS1 1.0135 0.9914 Jounama PS 66 JOUNAMA1 NYS12A NYS1 1.0166 1.0314 Kreepit 66 KEEPIT NKPT NKP3 1.0038 1.0015 Liverpool 132 (Jacks Gully) 132 JACKSGUL <t< td=""><td>Campbelltown WSLC</td><td>66</td><td>WESTCBT1</td><td>NING1C</td><td>NING</td><td>1.0001</td><td>1.0005</td><td></td></t<>	Campbelltown WSLC	66	WESTCBT1	NING1C	NING	1.0001	1.0005	
Cullerin Range Wind Farm 132 CULLRGWF NYS11C NYS1 1.0135 0.9914 Eastern Creek 132 EASTCRK NSW21 NSW2 1.0041 1.0035 Eraring 330 BS UN (GT) 330 ERGT01 NEP35B NEP3 0.9820 0.9829 Glenbawn Hydro PS 132 GLBWNHYD NMRK2G NMK 0.9607 0.9754 Glenn Innes (Pindari PS) 66 PINDARI NGLN1 NGLN 0.9000 0.9696 Grange Avenue 132 GRANGEAV NVYD1 NVPD 0.9989 0.9914 Gunning Wind Farm 132 GUNNING1 NYS12A NYS1 1.0135 0.9914 Jundabyne Generator 66 JNDABNE1 NCM2 NCM2 1.034 1.0314 Keepit 66 KEPIT NKPT NL93 1.008 1.0015 Liddell 33 – Hunter Valley 33 HVGTS NLD31 NLD3 0.9679 Grs 132 JACKSGUL NLP11 NSW2 <t< td=""><td>Condong PS</td><td>110</td><td>CONDONG1</td><td>NTNR1C</td><td>NTNR</td><td>0.9406</td><td>0.9986</td><td></td></t<>	Condong PS	110	CONDONG1	NTNR1C	NTNR	0.9406	0.9986	
Eastern Creek 132 EASTCRK NSW21 NSW2 1.001 1.003 Eraring 330 BS UN (GT) 330 ERGT01 NEP358 NEP3 0.9820 0.9829 Glenbawn Hydro PS 132 GLBWNHYD NMRK2G NMRK 0.9000 0.9696 Grange Avenue 132 GRANGEAV NVYD1 NVD 0.9989 0.9991 Gunning Wind Farm 132 GUNNING1 NYS12A NYS1 1.0135 0.9914 Jindabyne Generator 66 JNDABNE1 NCMA2 NCMA 1.0387 1.0106 Jounama PS 66 JOUNAMA1 NTU21 NTU2 1.0748 1.0314 Kneumber Landfill 66 KEEPIT NKPT NLP3 0.9582 0.9679 Lidell 33 - Hunter Valleg 33 HVGTS NLD31 NLD3 0.9582 0.9679 Licas Heights II Power 132 JACKSGUL NLP11 NSW2 1.003 1.0029 Power Station 132 LUCASH25 NSYS1	Copeton Hydro PS	66	COPTNHYD	NNVL1C	NNVL	0.9127	0.9823	
Eraring 330 BS UN (GT) 330 ERGT01 NEP35B NEP3 0.9820 0.9829 Glenbawn Hydro PS 132 GLBWNHYD NMRK2G NMRK 0.9637 0.9754 Glenn Innes (Pindari PS) 66 PINDARI NGLN NGLN 0.9000 0.9696 Grange Avenue 132 GRANGEAV NVYD1 NVYD 0.9989 0.9991 Gunning Wind Farm 132 GUNNING1 NYS12A NYS1 1.0135 0.9914 Jindabyne Generator 66 JOUNAMA1 NTU21J NTU2 1.0748 1.0314 Keepit 66 KEEPIT NKPT NKPT 0.9592 0.9879 Kincumber Landfill 66 KEEPIT NKPT NKPT 0.9592 0.9679 Gleid 33 – Hunter Valley 33 HVGTS NLD31 NLD3 0.9582 0.9679 Liceas Heights II Power 132 JACKSGUL NLP11 NSYS 1.0033 1.0029 Power Station 66 MOREESF1 NMR41M<	Cullerin Range Wind Farm	132	CULLRGWF	NYS11C	NYS1	1.0135	0.9914	
Glenbarn Hydro PS 132 GLBWNHYD NMRK2G NMRK 0.9637 0.9754 Glenn Innes (Pindari PS) 66 PINDARI NGLN1 NGLN 0.9000 0.9696 Grange Avenue 132 GRANGEAV NVYD1 NVYD 0.9989 0.9991 Gunning Wind Farm 132 GUNNING1 NYS12A NYS1 1.0135 0.9914 Jindabyne Generator 66 JNDABNE1 NCMA2 NCMA 1.0387 1.0106 Jounama PS 66 JOUNAMA1 NTU21 NTU2 1.0748 1.0314 Keepit 66 KEEPIT NKPT NKPT 0.9592 0.9879 Kincumber Landfill 66 KINCUM1 NGF31 NLD3 1.0015 1.0015 Liddell 33 - Hunter Valley GTs 33 HVGTS NLD31 NLD3 0.9582 0.9679 Lucas Heights Il Power Plant 132 LUCASHGT NSYS2G NSYS 1.0033 1.0029 Noree Solar Farm 66 MOREST1	Eastern Creek	132	EASTCRK	NSW21	NSW2	1.0041	1.0035	
Glenn Innes (Pindari PS) 66 PINDARI NGLNI NGLN 0.9000 0.9696 Grange Avenue 132 GRANGEAV NVYD1 NVYD 0.9989 0.9991 Gunning Wind Farm 132 GUNNING1 NYS12A NYS1 1.0135 0.9914 Jindabyne Generator 66 JNDABNE1 NCMA2 NCMA 1.0387 1.0106 Jounama PS 66 JOUNAMA1 NTU21 NTU2 1.0748 1.0314 Keepit 66 KEEPIT NKPT NKPT 0.9592 0.9879 Kincumber Landfill 66 KINCUM1 NGF31K NGF3 1.0008 1.0015 Liddell 33 - Hunter Valley GTs 33 HVGTS NLD31 NLD3 0.9582 0.9679 Livaes Heights II Power Plant 132 LUCASHGT NSYS2G NSYS 1.0033 1.0029 Moree Solar Farm 66 MOREESF1 NMR41M NMR4 0.9811 0.9433 Nine Willoughby 132 NINEWIL1	Eraring 330 BS UN (GT)	330	ERGT01	NEP35B	NEP3	0.9820	0.9829	
Grange Avenue132GRANGEAVNVYD1NVYD0.99890.9911Gunning Wind Farm132GUNNING1NYS12ANYS11.01350.9914Jindabyne Generator66JNDABNE1NCMA2NCMA1.03871.0106Jounama PS66JOUNAMA1NTU21JNTU21.07481.0314Keepit66KEEPITNKPTNKPT0.95920.9879Kincumber Landfill66KINCUM1NGF31KNGF31.00081.0015Liddell 33 - Hunter Valley GTs33HVGTSNLD31NLD30.95820.9679Liverpool 132 (Jacks Gully)132JACKSGULNLP11NSW21.00411.0035Lucas Heights II Power Plant132LUCASHGTNSYS2GNSYS1.00331.0029Moree Solar Farm66MOREESF1NMR41MNMR40.89110.9433Nine Willoughby132NINEWIL1NSE21RNSE21.00481.0050Nyngan Solar Farm132SITHE01NSW1MNWL80.98310.9093Sithe132SITHE01NSY11NSW21.00411.0035St George Leagues Club33STGEORG1NPHT1ENPH1.00221.0013Talawara PS132TAHMOOR1NLP12TNLP11.00130.9967Taralga Wind Farm132TARLGA1NMR22TNMR20.99880.9922	Glenbawn Hydro PS	132	GLBWNHYD	NMRK2G	NMRK	0.9637	0.9754	
Gunning Wind Farm132GUNNING1NYS12ANYS11.01350.9914Jindabyne Generator66JNDABNE1NCMA2NCMA1.03871.0106Jounama PS66JOUNAMA1NTU21JNTU21.07481.0314Keepit66KEEPITNKPTNKPT0.95920.9879Kincumber Landfill66KINCUM1NGF31KNGF31.00081.0015Liddell 33 - Hunter Valley33HVGTSNLD31NLD30.95820.9679Liverpool 132 (Jacks Gully)132JACKSGULNLP11NSW21.00411.0035Lucas Heights II Power132LUCASHGTNSYS2GNSYS1.00331.0029Plant66MOREESF1NMR41MNMR40.89110.9433Nine Willoughby132NINEWIL1NSE21RNSE21.00481.0035Sithe132STGEORG1NPHT1ENPHT1.00691.0071Sithe132TAHMOOR1NLP12TNLP11.00221.0011Talawara PS132TALWA1NMR22TNMR21.00130.9967	Glenn Innes (Pindari PS)	66	PINDARI	NGLN1	NGLN	0.9000	0.9696	
Jindabyne Generator 66 JNDABNE1 NCMA2 NCMA 1.0387 1.0106 Jounama PS 66 JOUNAMA1 NTU21J NTU2 1.0748 1.0314 Keepit 66 KEEPIT NKPT NKPT 0.9592 0.9879 Kincumber Landfill 66 KINCUM1 NGF31K NGF3 1.0008 1.0015 Liddell 33 – Hunter Valley 33 HVGTS NLD31 NLD3 0.9582 0.9679 Liverpool 132 (Jacks Gully) 132 JACKSGUL NLP11 NSW2 1.0041 1.0035 Lucas Heights II Power 132 LUCASLS2 NSYS1 NSYS 1.0033 1.0029 Moree Solar Farm 66 MOREESF1 NMR41M NMR4 0.8911 0.9433 Nine Willoughby 132 NINEWIL1 NSE21R NSE2 1.0048 1.0050 Nyngan Solar Farm 132 NINEWIL1 NSW2 1.0041 1.0035 Sithe 132 STGEORG1 NPHT1E NPHT	Grange Avenue	132	GRANGEAV	NVYD1	NVYD	0.9989	0.9991	
Jounama PS 66 JOUNAMA1 NTU21J NTU2 1.0748 1.0314 Keepit 66 KEEPIT NKPT NKPT 0.9592 0.9879 Kincumber Landfill 66 KINCUM1 NGF31K NGF3 1.0008 1.0015 Liddell 33 – Hunter Valley GTs 33 HVGTS NLD31 NLD3 0.9582 0.9679 Liverpool 132 (Jacks Gully) 132 JACKSGUL NLP11 NSW2 1.0041 1.0035 Lucas Heights II Power Plant 132 JACKSGUL NLP11 NSW2 1.0041 1.0029 Moree Solar Farm 66 MOREESF1 NMR41M NMR4 0.8911 0.9433 Nine Willoughby 132 NINEWIL1 NSE21R NSE2 1.0048 1.0050 Sithe 132 NINEWIL1 NSE21R NSE2 1.0041 1.0035 Sithe 132 NINEWIL1 NSE21R NSE2 1.0048 1.0050 Sithe 132 SITHE01 NSYW1 NSW2 <td>Gunning Wind Farm</td> <td>132</td> <td>GUNNING1</td> <td>NYS12A</td> <td>NYS1</td> <td>1.0135</td> <td>0.9914</td> <td></td>	Gunning Wind Farm	132	GUNNING1	NYS12A	NYS1	1.0135	0.9914	
Keepit66KEEPITNKPTNKPT0.95920.9879Kincumber Landfill66KINCUM1NGF31KNGF31.00081.0015Liddell 33 – Hunter Valley GTs33HVGTSNLD31NLD30.95820.9679Liverpool 132 (Jacks Gully)132JACKSGULNLP11NSW21.00411.0035Lucas Heights II Power Plant132LUCASHGTNSYS2GNSYS1.00331.0029Lucas Heights Stage 2 Power Station132LUCAS2S2NSYS1NSYS1.00331.0029Moree Solar Farm66MOREESF1NMR41MNMR40.89110.9433Nine Willoughby132NINEWIL1NSE21RNSE21.00411.0035Sithe132SITHE01NSYW1NSW21.00411.0035Sithe132TAHMOOR1NLP12TNLP11.00291.0011Talmoor PS132TALWA1NDT13TNTWA1.00130.9967Taralga Wind Farm132TARALGA1NMR22TNMR20.99880.9922	Jindabyne Generator	66	JNDABNE1	NCMA2	NCMA	1.0387	1.0106	
Kincumber Landfill66KINCUM1NGF31KNGF31.00081.0015Liddell 33 - Hunter Valley GTs33HVGTSNLD31NLD30.95820.9679Liverpool 132 (Jacks Gully)132JACKSGULNLP11NSW21.00411.0035Lucas Heights II Power Plant132LUCASHGTNSYSCNSYS1.00331.0029Lucas Heights Stage 2 Power Station132LUCAS2S2NSYS1NSYS1.00331.0029Moree Solar Farm66MOREESF1NMR41MNMR40.89110.9433Nine Willoughby132NINEWIL1NSE21RNSE21.00481.0050Nyngan Solar Farm132SITHE01NSYW1NWL80.98310.9099Sithe133STGEORG1NPHT1ENPHT1.00291.0011Tahmoor PS132TAHMOOR1NLP12TNLP11.00221.0019Tallawarra PS132TARLGA1NMR2ZTNMR20.99980.9922	Jounama PS	66	JOUNAMA1	NTU21J	NTU2	1.0748	1.0314	
Liddell 33 - Hunter Valley GTs33HVGTSNLD31NLD30.95820.9679Liverpool 132 (Jacks Gully)132JACKSGULNLP11NSW21.00411.0035Lucas Heights II Power Plant132LUCASHGTNSYS2GNSYS1.00331.0029Lucas Heights Stage 2 Power Station132LUCAS2S2NSYS1NSYS1.00331.0029Moree Solar Farm66MOREESF1NMR41MNMR40.89110.9433Nine Willoughby132NINEWIL1NSE21RNSE21.00481.0050Sithe132SITHE01NSYW1NSW21.00411.0035St George Leagues Club33STGEORG1NPH71ENPH71.00691.0071Tahmoor PS132TAHMOOR1NLP12TNLP11.00130.9967Taralga Wind Farm132TARALGA1NMR22TNMR20.99880.9922	Keepit	66	KEEPIT	NKPT	NKPT	0.9592	0.9879	
GTsImage: Constraint of the section of th	Kincumber Landfill	66	KINCUM1	NGF31K	NGF3	1.0008	1.0015	
Lucas Heights II Power Plant132LUCASHGTNSYS2GNSYS1.00331.0029Lucas Heights Stage 2 Power Station132LUCAS2S2NSYS1NSYS1.00331.0029Moree Solar Farm66MOREESF1NMR41MNMR40.89110.9433Nine Willoughby132NINEWIL1NSE21RNSE21.00481.0050Nyngan Solar Farm132NYNGAN1NWL82NNWL80.98310.9909Sithe132SITHE01NSYW1NSW21.00411.0035St George Leagues Club33STGEORG1NPHT1ENPHT1.00291.0011Tahmoor PS132TAHMOOR1NLP12TNLP11.00130.9967Tallawarra PS132TARALGA1NMR22TNMR20.99980.9922	2	33	HVGTS	NLD31	NLD3	0.9582	0.9679	
Plant	Liverpool 132 (Jacks Gully)	132	JACKSGUL	NLP11	NSW2	1.0041	1.0035	
Power StationImage: State of the		132	LUCASHGT	NSYS2G	NSYS	1.0033	1.0029	
Nine Willoughby132NINEWIL1NSE21RNSE21.00481.0050Nyngan Solar Farm132NYNGAN1NWL82NNWL80.98310.9090Sithe132SITHE01NSYW1NSW21.00411.0035St George Leagues Club33STGEORG1NPHT1ENPHT1.00691.0071Tahmoor PS132TAHMOOR1NLP12TNLP11.00221.0019Tallawarra PS132TARALGA1NMR22TNMR20.99980.9922	0 0	132	LUCAS2S2	NSYS1	NSYS	1.0033	1.0029	
Nyngan Solar Farm 132 NYNGAN1 NWL82N NWL8 0.9831 0.9909 Sithe 132 SITHE01 NSYW1 NSW2 1.0041 1.0035 St George Leagues Club 33 STGEORG1 NPHT1E NPHT 1.0069 1.0071 Tahmoor PS 132 TAHMOOR1 NLP12T NLP1 1.0022 1.0019 Tallawarra PS 132 TALWA1 NDT13T NTWA 1.0013 0.9967 Taralga Wind Farm 132 TARALGA1 NMR22T NMR2 0.9998 0.9922	Moree Solar Farm	66	MOREESF1	NMR41M	NMR4	0.8911	0.9433	
Sithe 132 SITHE01 NSYW1 NSW2 1.0041 1.0035 St George Leagues Club 33 STGEORG1 NPHT1E NPHT 1.0069 1.0071 Tahmoor PS 132 TAHMOOR1 NLP12T NLP1 1.0022 1.0019 Tallawarra PS 132 TALWA1 NDT13T NTWA 1.0013 0.9967 Taralga Wind Farm 132 TARALGA1 NMR22T NMR2 0.9998 0.9922	Nine Willoughby	132	NINEWIL1	NSE21R	NSE2	1.0048	1.0050	
St George Leagues Club33STGEORG1NPHT1ENPHT1.00691.0071Tahmoor PS132TAHMOOR1NLP12TNLP11.00221.0019Tallawarra PS132TALWA1NDT13TNTWA1.00130.9967Taralga Wind Farm132TARALGA1NMR22TNMR20.99980.9922	Nyngan Solar Farm	132	NYNGAN1	NWL82N	NWL8	0.9831	0.9909	
Tahmoor PS 132 TAHMOOR1 NLP12T NLP1 1.0022 1.0019 Tallawarra PS 132 TALWA1 NDT13T NTWA 1.0013 0.9967 Taralga Wind Farm 132 TARALGA1 NMR22T NMR2 0.9998 0.9922	Sithe	132	SITHE01	NSYW1	NSW2	1.0041	1.0035	
Tallawarra PS 132 TALWA1 NDT13T NTWA 1.0013 0.9967 Taralga Wind Farm 132 TARALGA1 NMR22T NMR2 0.9998 0.9922	St George Leagues Club	33	STGEORG1	NPHT1E	NPHT	1.0069	1.0071	
Taralga Wind Farm132TARALGA1NMR22TNMR20.99980.9922	Tahmoor PS	132	TAHMOOR1	NLP12T	NLP1	1.0022	1.0019	
	Tallawarra PS	132	TALWA1	NDT13T	NTWA	1.0013	0.9967	
Teralba Power Station 132 TERALBA NNEW1 NNEW 0.9892 0.9907	Taralga Wind Farm	132	TARALGA1	NMR22T	NMR2	0.9998	0.9922	
	Teralba Power Station	132	TERALBA	NNEW1	NNEW	0.9892	0.9907	



Location	Voltage (kV)	DUID	Connection Point ID	TNI	2017-18 MLF	2016-17 MLF	Remark
The Drop PS	66	THEDROP1	NFNY1D	NFNY	1.1256	1.0157	
Tower Power Plant	132	TOWER	NLP11T	NLP1	1.0022	1.0019	
West Nowra	132	AGLNOW1	NDT12	NDT1	1.0023	0.9986	
Wests Illawara Leagues Club	132	WESTILL1	NDT14E	NDT1	1.0023	0.9986	
Wilga Park A	66	WILGAPK	NNB21W	NNB2	0.9746	1.0154	
Wilga Park B	66	WILGB01	NNB22W	NNB2	0.9746	1.0154	
Woodlawn Bioreactor	132	WDLNGN01	NMR21W	NMR2	0.9998	0.9922	
Woy Woy Landfill	66	WOYWOY1	NGF32W	NGF3	1.0008	1.0015	
Wyangala A PS	66	WYANGALA	NCW81A	NCW8	1.0435	1.0355	
Wyangala B PS	66	WYANGALB	NCW82B	NCW8	1.0435	1.0355	

Table 7 ACT Loads

Location	Voltage (kV)	TNI	2017-18 MLF	2016-17 MLF	Remark
Canberra ³	132	ACA1	1.0362	1.0095	
Angle Crossing ⁴	132	AAXG	1.0371		
Belconnen ⁴	132	ABCN	1.0388		
City East ⁴	132	ACTE	1.0419		
Civic ⁴	132	ACVC	1.0394		
East lake ⁴	132	AELK	1.0406		
Gilmore ⁴	132	AGLM	1.0397		
Gold Creek ⁴	132	AGCK	1.0383		
Latham ^₄	132	ALTM	1.0377		
Telopia Park ⁴	132	ATLP	1.0415		
Theodore ⁴	132	ATDR	1.0389		
Wanniassa⁴	132	AWSA	1.0400		
Woden ⁴	132	AWDN	1.0394		
ACT VTN ⁴	132	AAVT	1.0396		
Queanbeyan (ACTEW)	66	AQB1	1.0563	1.0257	
Queanbeyan (Essential Energy)	66	AQB2	1.0563	1.0257	

Table 8 **ACT Embedded Generation**

Location	Voltage (kV)	DUID	Connection Point ID	TNI	2017-18 MLF	2016-17 MLF	Remark
Capital East Solar Farm	66	CESF1	AQB21C	AQB2	1.0563	1.0257	
Mugga Lane Solar Farm ³	132	MLSP1	ACA12M	ACA1	1.0362	1.0095	
Mugga Lane Solar Farm (at Gilmore)	132	MLSP1	ACA12M	AMS1	1.0395		
Royalla Solar Farm ³	132	ROYALLA1	ACA11R	ACA1	1.0362	1.0095	

 ³ There is a currently a registration process in place to replace ACA1 and NWDL TNIs by 12 new TNIs in the ActewAGL network. Royalla and Mugga Lane Solar Farms will also have separate TNIs as part of the forementioned process. The 2017-18 MLF for ACA1 listed in the table above will apply from 01 July 2017 until the time when the 12 new TNIs are registered and in commercial operation.
 ⁴ The 2017-18 MLF value will apply once the TNI registration process is complete and in commercial operation. (see note above).





Location	Voltage (kV)	DUID	Connection Point ID	TNI	2017-18 MLF	2016-17 MLF	Remark
Royalla Solar Farm (at Theodore)	132	ROYALLA1	ACA11R	ARS1	1.0386		

The Regional Reference Node (RRN) for ACT load and generation is the Sydney West 330kV node.

1.3 Victoria Marginal Loss Factors

Table 9Victorian Loads

Location	Voltage (kV)	TNI	2017-18 MLF	2016-17 MLF	Remark
Altona	66	VATS	1.0084	1.0068	
Altona	220	VAT2	1.0081	1.001	
Ballarat	66	VBAT	1.016	1.0209	
Bendigo	66	VBE6	1.0398	1.0664	
Bendigo	22	VBE2	1.0405	1.0658	
BHP Western Port	220	VJLA	0.9948	0.9909	
Brooklyn (Jemena)	22	VBL2	1.0081	1.0064	
Brooklyn (Jemena)	66	VBL6	1.0069	1.0054	
Brooklyn (Powercor)	22	VBL3	1.0081	1.0064	
Brooklyn (Powercor)	66	VBL7	1.0069	1.0054	
Brunswick (CitiPower)	22	VBT2	1.0008	1.0003	
Brunswick (Jemena)	22	VBTS	1.0008	1.0003	
Brunswick 66 kV (CitiPower)	66	VBT6	0.9993	0.9987	
Cranbourne	220	VCB2	0.9933	0.9897	
Cranbourne (AusNet Services)	66	VCBT	0.9962	0.9919	
Cranbourne (United Energy)	66	VCB5	0.9962	0.9919	
Deer Park	66	VDPT	1.0069		Effective from 09/06/2017
East Rowville (AusNet Services)	66	VER2	0.9962	0.9932	
East Rowville (United Energy)	66	VERT	0.9962	0.9932	
Fishermens Bend (CitiPower)	66	VFBT	1.0046	1.0036	
Fishermens Bend (Powercor)	66	VFB2	1.0046	1.0036	
Fosterville	220	VFVT	1.0305	1.0619	
Geelong	66	VGT6	1.0055	1.0048	
Glenrowan	66	VGNT	0.9884	1.0368	
Heatherton	66	VHTS	1.0007	0.9986	
Heywood	22	VHY2	1.0096	1.0111	
Horsham	66	VHOT	1.0473	1.0803	
Keilor (Jemena)	66	VKT2	1.0048	1.0037	
Keilor (Powercor)	66	VKTS	1.0048	1.0037	
Kerang	22	VKG2	1.0779	1.1124	
Kerang	66	VKG6	1.0755	1.1118	
Khancoban	330	NKHN	0.9369	1.0123	
Loy Yang Substation	66	VLY6	0.9826	0.9709	



Location	Voltage (kV)	TNI	2017-18 MLF	2016-17 MLF	Remark
Malvern	22	VMT2	0.9982	0.9962	
Malvern	66	VMT6	0.9971	0.995	
Morwell Power Station Units 1 to 3	66	VMWG	0.982	0.9707	
Morwell PS (G4&5)	11	VMWP	0.9821	0.9708	
Morwell TS	66	VMWT	0.9886	0.9759	
Mt Beauty	66	VMBT	0.9743	1.0189	
Portland	500	VAPD	1.0121	1.0135	
Pt Henry	220	VPTH	1.003	1.0023	
Red Cliffs	22	VRC2	1.1108	1.1621	
Red Cliffs	66	VRC6	1.1068	1.1602	
Red Cliffs (Essential Energy)	66	VRCA	1.1068	1.1602	
Richmond	22	VRT2	0.9997	0.9979	
Richmond (CitiPower)	66	VRT7	1.0015	1.0000	
Richmond (United Energy)	66	VRT6	1.0015	1.0000	
Ringwood (AusNet Services)	22	VRW3	1.0005	0.9989	
Ringwood (AusNet Services)	66	VRW7	1.0005	0.9990	
Ringwood (United Energy)	22	VRW2	1.0005	0.9989	
Ringwood (United Energy)	66	VRW6	1.0005	0.9990	
Shepparton	66	VSHT	1.0037	1.0502	
South Morang (Jemena)	66	VSM6	0.9980	0.9985	
South Morang (AusNet Services)	66	VSMT	0.9980	0.9985	
Springvale (CitiPower)	66	VSVT	0.9989	0.9972	
Springvale (United Energy)	66	VSV2	0.9989	0.9972	
Templestowe (CitiPower)	66	VTS2	1.0005	0.9995	
Templestowe (Jemena)	66	VTST	1.0005	0.9995	
Templestowe (AusNet Services)	66	VTS3	1.0005	0.9995	
Templestowe (United Energy)	66	VTS4	1.0005	0.9995	
Terang	66	VTGT	1.0322	1.0339	
Thomastown (Jemena)	66	VTTS	1.0000	1.0000	
Thomastown (AusNet Services)	66	VTT2	1.0000	1.0000	
Tyabb	66	VTBT	0.9963	0.9925	
Wemen 66 kV (Essential Energy)	66	VWEA	1.1038	1.1513	
Wemen TS	66	VWET	1.1038	1.1513	
West Melbourne	22	VWM2	1.0027	1.0021	
West Melbourne (CitiPower)	66	VWM7	1.0041	1.0031	
West Melbourne (Jemena)	66	VWM6	1.0041	1.0031	
Wodonga	22	VWO2	0.9654	1.0252	
Wodonga	66	VWO6	0.9621	1.0235	
Yallourn	11	VYP1	0.9582	0.9528	



Table 10Victoria Generation

Location	Voltage (kV)	DUID	Connecti on Point ID	TNI	2017-18 MLF	2016-17 MLF	Remark
Ararat WF	220	ARWF1	VART1A	VART	1.0019	1.0299	
Banimboola	220	BAPS	VDPS2	VDPS	0.9372	0.9812	
Basslink (Loy Yang PS Switchyard) Tasmania to Victoria	500	BLNKVIC	VLYP13	VTBL	0.9874	0.9765	
Dartmouth PS	220	DARTM1	VDPS	VDPS	0.9372	0.9812	
Eildon PS Unit 1	220	EILDON1	VEPS1	VEPS	0.9696	0.9945	
Eildon PS Unit 2	220	EILDON2	VEPS2	VEPS	0.9696	0.9945	
Hazelwood PS Load⁵	220	HWPNL1	VHWPL	VHWP	0.9820	0.9701	
Jeeralang A PS Unit 1	220	JLA01	VJLGA1	VJLG	0.9830	0.9641	
Jeeralang A PS Unit 2	220	JLA02	VJLGA2	VJLG	0.9830	0.9641	
Jeeralang A PS Unit 3	220	JLA03	VJLGA3	VJLG	0.9830	0.9641	
Jeeralang A PS Unit 4	220	JLA04	VJLGA4	VJLG	0.9830	0.9641	
Jeeralang B PS Unit 1	220	JLB01	VJLGB1	VJLG	0.9830	0.9641	
Jeeralang B PS Unit 2	220	JLB02	VJLGB2	VJLG	0.9830	0.9641	
Jeeralang B PS Unit 3	220	JLB03	VJLGB3	VJLG	0.9830	0.9641	
Jindabyne pump at Guthega	132	SNOWYGJP	NGJP	NGJP	1.0474	1.1115	
Kiata Wind farm	66	KIATAWF1	VHOG1K	VHOG	1.0357		Effective from 03/11/2017
Laverton PS (LNGS1)	220	LNGS1	VAT21L	VAT2	1.0081	1.0010	
Laverton PS (LNGS2)	220	LNGS2	VAT22L	VAT2	1.0081	1.0010	
Loy Yang A PS Load	500	LYNL1	VLYPL	VLYP	0.9801	0.9723	
Loy Yang A PS Unit 1	500	LYA1	VLYP1	VLYP	0.9801	0.9723	
Loy Yang A PS Unit 2	500	LYA2	VLYP2	VLYP	0.9801	0.9723	
Loy Yang A PS Unit 3	500	LYA3	VLYP3	VLYP	0.9801	0.9723	
Loy Yang A PS Unit 4	500	LYA4	VLYP4	VLYP	0.9801	0.9723	
Loy Yang B PS Unit 1	500	LOYYB1	VLYP5	VLYP	0.9801	0.9723	
Loy Yang B PS Unit 2	500	LOYYB2	VLYP6	VLYP	0.9801	0.9723	
MacArthur Wind Farm	500	MACARTH1	VTRT1M	VTRT	1.0017	1.0022	
McKay Creek / Bogong PS	220	MCKAY1	VMKP1	VT14	0.9213	0.9543	
Mortlake Unit 1	500	MORTLK11	VM0P1O	VM0P	1.0050	1.0015	
Mortlake Unit 2	500	MORTLK12	VM0P2O	VM0P	1.0050	1.0015	
Mt Mercer Windfarm	220	MERCER01	VELT1M	VELT	1.0010	1.0048	
Murray	330	MURRAY	NMUR8	NMUR	0.8964	0.9590	
Newport PS	220	NPS	VNPS	VNPS	0.9990	0.9939	
Valley Power Unit 1	500	VPGS1	VLYP07	VLYP	0.9801	0.9723	
Valley Power Unit 2	500	VPGS2	VLYP08	VLYP	0.9801	0.9723	
Valley Power Unit 3	500	VPGS3	VLYP09	VLYP	0.9801	0.9723	
Valley Power Unit 4	500	VPGS4	VLYP010	VLYP	0.9801	0.9723	
Valley Power Unit 5	500	VPGS5	VLYP011	VLYP	0.9801	0.9723	
Valley Power Unit 6	500	VPGS6	VLYP012	VLYP	0.9801	0.9723	

⁵ 2017/18 MLFs include the retirement of Hazelwood PS



Location	Voltage (kV)	DUID	Connecti on Point ID	TNI	2017-18 MLF	2016-17 MLF	Remark
Waubra Wind Farm	220	WAUBRAWF	VWBT1A	VWBT	0.9997	1.0111	
West Kiewa PS Unit 1	220	WKIEWA1	VWKP1	VWKP	0.9540	1.0026	
West Kiewa PS Unit 2	220	WKIEWA2	VWKP2	VWKP	0.9540	1.0026	
Yallourn W PS 220 Load	220	YWNL1	VYP2L	VYP2	0.9558	0.9509	
Yallourn W PS 220 Unit 1	220	YWPS1	VYP21	VYP3	0.9702	0.9541	
Yallourn W PS 220 Unit 2	220	YWPS2	VYP22	VYP2	0.9558	0.9509	
Yallourn W PS 220 Unit 3	220	YWPS3	VYP23	VYP2	0.9558	0.9509	
Yallourn W PS 220 Unit 4	220	YWPS4	VYP24	VYP2	0.9558	0.9509	

Table 11 Victoria Embedded Generation

Location	Voltage (kV)	DUID	Connection Point ID	TNI	2017-18 MLF	2016-17 MLF
Bairnsdale Power Station	66	BDL01	VMWT2	VBDL	0.9863	0.9745
Bairnsdale PS Generator Unit 2	66	BDL02	VMWT3	VBDL	0.9863	0.9745
Bald Hills WF	66	BALDHWF1	VMWT9B	VMWT	0.9886	0.9759
Ballarat Health Services	66	BBASEHOS	VBAT1H	VBAT	1.0160	1.0209
Broadmeadows Power Plant	66	BROADMDW	VTTS2B	VTTS	1.0000	1.0000
Brooklyn Landfill & Recycling Facility	66	BROOKLYN	VBL61	VBL6	1.0069	1.0054
Chepstowe Wind Farm	66	CHPSTWF1	VBAT3C	VBAT	1.0160	1.0209
Clayton Landfill Gas Power Station	66	CLAYTON	VSV21B	VSV2	0.9989	0.9972
Codrington Wind Farm	66	CODRNGTON	VTGT2C	VTGT	1.0322	1.0339
Coonooer Bridge WF	66	CBWF1	VBE61C	VBE6	1.0398	1.0664
Corio LFG PS	66	CORIO1	VGT61C	VGT6	1.0055	1.0048
Eildon Hydro PS	66	EILDON3	VTT22E	VSMT	0.9980	0.9985
Glenmaggie Hydro PS	66	GLENMAG1	VMWT8G	VMWT	0.9886	0.9759
Hallam Mini Hydro	66	HLMSEW01	VER21H	VER2	0.9962	0.9932
Hallam Road Renewable Energy Facility	66	HALAMRD1	VER22L	VER2	0.9962	0.9932
Hepburn Community WF	66	HEPWIND1	VBAT2L	VBAT	1.0160	1.0209
Hume (Victorian Share)	66	HUMEV	VHUM	VHUM	0.8911	0.9947
Longford	66	LONGFORD	VMWT6	VMWT	0.9886	0.9759
Mornington Landfill Site Generator	66	MORNW	VTBT1	VTBT	0.9963	0.9925
Mortons Lane Wind Farm	66	MLWF1	VTGT4M	VTGT	1.0322	1.0339
Oaklands Hill Wind Farm	66	OAKLAND1	VTGT3A	VTGT	1.0322	1.0339
Shepparton Waste Gas	66	SHEP1	VSHT2S	VSHT	1.0037	1.0502
Somerton Power Station	66	AGLSOM	VTTS1	VSOM	0.9968	0.9949
Springvale Power Plant	66	SVALE1	VSV22S	VSV2	0.9989	0.9972
Tatura	66	TATURA01	VSHT1	VSHT	1.0037	1.0502



Location	Voltage (kV)	DUID	Connection Point ID	TNI	2017-18 MLF	2016-17 MLF
Toora Wind Farm	66	TOORAWF	VMWT5	VMWT	0.9886	0.9759
Traralgon NSS	66	TGNSS1	VMWT1T	VMWT	0.9886	0.9759
William Horvell Hydro PS	66	WILLHOV1	VW061W	VWO6	0.9621	1.0235
Wollert Renewable Energy Facility	66	WOLLERT1	VSMT1W	VSMT	0.9980	0.9985
Wonthaggi Wind Farm	66	WONWP	VMWT7	VMWT	0.9886	0.9759
Wyndham Landfill Site Generator	66	WYNDW	VATS1	VATS	1.0084	1.0068
Yambuk Wind Farm	66	YAMBUKWF	VTGT1	VTGT	1.0322	1.0339
Yarrawonga Hydro PS	66	YWNGAHYD	VSHT3Y	VSHT	1.0037	1.0502

1.4 South Australia Marginal Loss Factors

Table 12 South Australia Loads

Location	Voltage (kV)	TNI	2017-18 MLF	2016-17 MLF
Angas Creek	33	SANC	1.0096	1.0093
Ardrossan West	33	SARW	0.9541	0.9544
Back Callington	11	SBAC	1.0092	1.0071
Baroota	33	SBAR	1.0066	1.0125
Berri	66	SBER	0.9485	0.9379
Berri (Powercor)	66	SBE1	0.9485	0.9379
Blanche	33	SBLA	0.9371	0.9218
Blanche (Powercor)	33	SBL1	0.9371	0.9218
Brinkworth	33	SBRK	1.0011	1.0061
Bungama Industrial	33	SBUN	1.0016	1.0078
Bungama Rural	33	SBUR	1.0114	1.0194
City West	66	SACR	1.0045	1.0047
Clare North	33	SCLN	0.9972	1.0012
Dalrymple	33	SDAL	0.9193	0.9153
Davenport	275	SDAV	1.0048	1.0114
Davenport	33	SDAW	1.0066	1.0129
Dorrien	33	SDRN	1.0083	1.0114
East Terrace	66	SETC	1.0047	1.0048
Happy Valley	66	SHVA	1.0051	1.0050
Hummocks	33	SHUM	0.9751	0.9758
Kadina East	33	SKAD	0.9804	0.9815
Kanmantoo	11	SKAN	1.0089	1.0070
Keith	33	SKET	0.9780	0.9703
Kilburn	66	SKLB	1.0035	1.0017
Kincraig	33	SKNC	0.9571	0.9452
Lefevre	66	SLFE	0.9995	0.9997
Leigh Creek	33	SLCC	1.0575	1.0791
Leigh Creek South	33	SLCS	1.0589	1.0719
Magill	66	SMAG	1.0044	1.0044





Location	Voltage (kV)	TNI	2017-18 MLF	2016-17 MLF
Mannum	33	SMAN	1.0098	1.0071
Mannum – Adelaide Pipeline 1	3.3	SMA1	1.0143	1.0137
Mannum – Adelaide Pipeline 2	3.3	SMA2	1.0134	1.0132
Mannum – Adelaide Pipeline 3	3.3	SMA3	1.0136	1.0135
Middleback	33	SMDL	1.0085	1.0170
Middleback	132	SMBK	1.0102	1.0202
Millbrook	132	SMLB	1.0055	1.0046
Mobilong	33	SMBL	1.0065	1.0032
Morgan – Whyalla Pipeline 1	3.3	SMW1	0.9797	0.9810
Morgan – Whyalla Pipeline 2	3.3	SMW2	0.9872	0.9908
Morgan – Whyalla Pipeline 3	3.3	SMW3	0.9921	0.9972
Morgan – Whyalla Pipeline 4	3.3	SMW4	0.9926	0.9978
Morphett Vale East	66	SMVE	1.0047	1.0051
Mount Barker South	66	SMBS	1.0041	1.0037
Mt Barker	66	SMBA	1.0041	1.0029
Mt Gambier	33	SMGA	0.9390	0.9231
Mt Gunson	33	SMGU	1.0373	1.0445
Munno Para	66	SMUP	1.0035	1.0044
Murray Bridge - Hahndorf Pipeline 1	11	SMH1	1.0088	1.0096
Murray Bridge - Hahndorf Pipeline 2	11	SMH2	1.0105	1.0120
Murray Bridge - Hahndorf Pipeline 3	11	SMH3	1.0102	1.0119
Neuroodla	33	SNEU	1.0308	1.0392
New Osborne	66	SNBN	0.9990	0.9995
North West Bend	66	SNWB	0.9778	0.9754
Northfield	66	SNFD	1.0034	1.0037
Para	66	SPAR	1.0041	1.0042
Parafield Gardens West	66	SPGW	1.0039	1.0054
Penola West 33	33	SPEN	0.9376	0.9241
Pimba	132	SPMB	1.0429	1.0493
Playford	132	SPAA	1.0038	1.0132
Port Lincoln	33	SPLN	0.9900	1.0021
Port Pirie	33	SPPR	1.0110	1.0150
Roseworthy	11	SRSW	1.0103	1.0134
Snuggery Industrial (Dual MLF – Generation)	33	SSNN	0.9174	0.9176
Snuggery Industrial (Dual MLF – Load)	33	SSNN	0.9102	0.9176
Snuggery Rural	33	SSNR	0.9181	0.9016
South Australian VTN	50	SJP1	0.9994	1.0001
Stony Point	11	SSPN	1.0109	1.0189
Tailem Bend	33	STAL	0.9936	0.9896
Templers	33	STEM	1.0061	1.0086
Torrens Island	66	STSY	1.0000	1.0000
Waterloo	33	SWAT	0.9897	0.9931
Whyalla Central Substation	33	SWYC	1.0112	1.0196
Whyalia Terminal BHP	33	SBHP	1.0112	1.0181



Location	Voltage (kV)	TNI	2017-18 MLF	2016-17 MLF
Woomera	132	SWMA	1.0432	1.0510
Wudina	66	SWUD	1.0118	1.0229
Yadnarie	66	SYAD	0.9986	1.0080

Table 13 South Australia Generation

Location	Voltage (kV)	DUID	Connection Point ID	TNI	2017-18 MLF	2016-17 MLF	Remark
Cathedral Rocks Wind Farm	132	CATHROCK	SCRK	SCRK	0.8965	0.8896	
Clements Gap Wind Farm	132	CLEMGPWF	SCGW1P	SCGW	0.9787	0.9822	
Dry Creek PS Unit 1	66	DRYCGT1	SDCA1	SDPS	1.0019	1.0011	
Dry Creek PS Unit 2	66	DRYCGT2	SDCA2	SDPS	1.0019	1.0011	
Dry Creek PS Unit 3	66	DRYCGT3	SDCA3	SDPS	1.0019	1.0011	
Hallett 2 WF	275	HALLWF2	SMOK1H	SMOK	0.9818	0.9871	
Hallett PS	275	AGLHAL	SHPS1	SHPS	0.9820	0.9900	
Hallett WF	275	HALLWF1	SHPS2W	SHPS	0.9820	0.9900	
Hornsdale WF Stage 1	275	HDWF1	SHDW1H	SHDW	0.9799	0.9918	Effective from 14/08/201
Hornsdale WF Stage 2	275	HDWF2	SHDW2H	SHDW	0.9799	0.9918	Effective from 14/08/201
Hornsdale WF Stage 3	275	HDWF3	SHDW3H	SHDW	0.9799		Effective from 14/08/201
Ladbroke Grove PS Unit 1	132	LADBROK1	SPEW1	SPEW	0.9170	0.8872	
Ladbroke Grove PS Unit 2	132	LADBROK2	SPEW2	SPEW	0.9170	0.8872	
Lake Bonney Wind Farm	33	LKBONNY1	SMAY1	SMAY	0.8906	0.8768	
Lake Bonney Wind Farm Stage 2	33	LKBONNY2	SMAY2	SMAY	0.8906	0.8768	
Lake Bonney Wind Farm Stage 3	33	LKBONNY3	SMAY3W	SMAY	0.8906	0.8768	
Mintaro PS	132	MINTARO	SMPS	SMPS	0.9941	0.9889	
Mt Millar Wind Farm	33	MTMILLAR	SMTM1	SMTM	0.9172	0.9120	
North Brown Hill Wind Farm	275	NBHWF1	SBEL1A	SBEL	0.9798	0.9863	
O.C.P.L. Unit 1	66	OSB-AG	SNBN1	SOCP	0.9988	0.9994	
Pelican Point PS	275	PPCCGT	SPPT	SPPT	1.0012	1.0009	
Port Lincoln 3	33	POR03	SPL31P	SPL3	1.0510	1.0064	
Port Lincoln PS	132	POR01	SPLN1	SPTL	1.0158	1.0011	
Quarantine PS Unit 1	66	QPS1	SQPS1	SQPS	0.9856	0.9864	
Quarantine PS Unit 2	66	QPS2	SQPS2	SQPS	0.9856	0.9864	
Quarantine PS Unit 3	66	QPS3	SQPS3	SQPS	0.9856	0.9864	
Quarantine PS Unit 4	66	QPS4	SQPS4	SQPS	0.9856	0.9864	
Quarantine PS Unit 5	66	QPS5	SQPS5Q	SQPS	0.9856	0.9864	
Snowtown WF Stage 2 - North	275	SNOWNTH1	SBLWS1	SBLW	0.9869	0.9888	
Snowtown WF Stage 2 - South	275	SNOWSTH1	SBLWS2	SBLW	0.9869	0.9888	
Snowtown Wind Farm	33	SNOWTWN1	SNWF1T	SNWF	0.9296	0.9289	
Snuggery PS Units 1 to 3	132	SNUG1	SSGA1	SSPS	0.9318	0.8417	
The Bluff wind Farm	275	BLUFF1	SBEL2P	SBEL	0.9798	0.9863	



Location	Voltage (kV)	DUID	Connection Point ID	TNI	2017-18 MLF	2016-17 MLF	Remark
Torrens Island PS A Unit 1	275	TORRA1	STSA1	STPS	1.0016	1.0014	
Torrens Island PS A Unit 2	275	TORRA2	STSA2	STPS	1.0016	1.0014	
Torrens Island PS A Unit 3	275	TORRA3	STSA3	STPS	1.0016	1.0014	
Torrens Island PS A Unit 4	275	TORRA4	STSA4	STPS	1.0016	1.0014	
Torrens Island PS B Unit 1	275	TORRB1	STSB1	STPS	1.0016	1.0014	
Torrens Island PS B Unit 2	275	TORRB2	STSB2	STPS	1.0016	1.0014	
Torrens Island PS B Unit 3	275	TORRB3	STSB3	STPS	1.0016	1.0014	
Torrens Island PS B Unit 4	275	TORRB4	STSB4	STPS	1.0016	1.0014	
Torrens Island PS Load	66	TORNL1	STSYL	STSY	1.0000	1.0000	
Waterloo Wind Farm	132	WATERLWF	SWLE1R	SWLE	0.9751	0.9784	
Wattle Point Wind Farm	132	WPWF	SSYP1	SSYP	0.8330	0.8185	

Table 14 South Australia Embedded Generation

Location	Voltage (kV)	DUID	Connection Point ID	TNI	2017-18 MLF	2016-17 MLF	Remark
Amcor Glass UN 1	11	AMCORGR	SRSW1E	SRSW	1.0103	1.0134	
Angaston Power Station	33	ANGAST1	SDRN1	SANG	1.0121	1.0042	
Blue Lake Milling	33	BLULAKE1	SKET2B	SKET	0.9780	0.9703	
Bolivar WWT Plant (NEW)	66	BOLIVAR1	SPGW1B	SPGW	1.0039	1.0054	
Canunda Wind Farm	33	CNUNDAWF	SSNN1	SCND	0.8967	0.885	
Cummins Lonsdale PS	66	LONSDALE	SMVE1	SMVE	1.0047	1.0051	
Pedler Creek Landfill Gas PS	66	PEDLER1	SMVE5C	SMVE	1.0047	1.0051	
Pt Stanvac Power Station	66	PTSTAN1	SMVE3P	SMVE	1.0047	1.0051	
Starfish Hill Wind Farm	66	STARHLWF	SMVE2	SMVE	1.0047	1.0051	
Tatiara Meat Co	33	TATIARA1	SKET1E	SKET	0.9780	0.9703	
Terminal Storage Mini-Hydro	66	TERMSTOR	SNFD1	SNFD	1.0034	1.0037	
Wingfield 1 LFG PS	66	WINGF1_1	SKLB1W	SKLB	1.0035	1.0017	
Wingfield 2 LFG PS	66	WINGF2_1	SNBN2W	SNBN	0.9990	0.9995	
Edinburgh Generation (at Para 66)	66	SATGN1	SPAG1E	SPAG	1.0022		Effective from 20/10/2017
Lonsdale Generation (at Morphett Vale East 66)	66	SATGS1	SMVG1L	SMVG	1.0007		Effective from 20/10/2017

1.5 Tasmania Marginal Loss Factors

Table 15Tasmania Loads

Location	Voltage (kV)	TNI	2017-18 MLF	2016-17 MLF
Arthurs Lake	6.6	TAL2	0.9937	1.0012
Avoca	22	TAV2	1.0017	1.0301
Boyer SWA	6.6	TBYA	1.0199	1.0322
Boyer SWB	6.6	TBYB	1.0197	1.0325





Bridgewater11TBW21.0.1411.0.278Burne22TBU30.96550.9905Chapel St.1117521.0.264Comalco220TCO11.0.0061.0.006Creek Road33TCR20.91020.9695Derky22TDE20.93680.9390Dervonport22TDE20.98640.9391Dervonport22TDE20.98640.9895Electrona11TEL20.96870.9875George Town (Basslink)220TTH0.96710.0755George Town (Basslink)220TTH0.9675George Town (Basslink)220TTH0.96811.0000Gordon22TGT31.00031.0001George Town (Basslink)220TTH0.98340.9885Hampshire110THM20.98340.9885Huon River11THR21.01631.0021Kingston111THR21.01631.0323Kingston111TKR21.01631.0323Kingston22TTM20.99190.9333Mornington23TTM21.01631.0329Newtor24TTM20.99190.9371Newtor22TTM20.96140.9714Nordok22TTM20.96140.9714Nordok22TTM20.96140.9714Nordok22TTM20.96140.9714N	Location	Voltage (kV)	TNI	2017-18 MLF	2016-17 MLF
Chapel St.11TGS31.01271.0244Cornaleo220TCC11.00061.0006Creek Road33TCR21.01401.0276Derky22TDE20.93720.9695Dervent Bridge22TDE20.93860.9390Devnoport22TDE20.98850.9390Devnoport22TDF20.98840.9895Eleatrona11TEL21.02551.0381Emu Bay11TEL20.98771.00231.0023George Town220TCT11.00001.0000Gordon220TCT11.00011.0000Gordon22TGT41.00011.0001Gordon22THA30.98841.0888Hampshire110THM20.98840.9885Huon River11THK21.01311.0232Kingston11TK121.01561.0331Kingston11TK121.01681.0331Meadowbank22TMV20.99110.9393Mowbray23TMV21.01511.0331Meadowbank22TMV20.99110.9393Mowbray23TMV20.99110.9313Mowbray24TMV20.99110.9313Mowhray25TMV20.99110.9314Newton22TMV20.99120.9314Newton24TMV20.94140.9456Newton	Bridgewater	11	TBW2	1.0141	1.0278
Comalco1200TCO11.00061.0006Creek Road33TCR21.01401.0276Derky122TDE20.96720.9695Dervorn Bridge22TDE20.93840.9390Devonport22TDE20.98621.0381Electrona11TEL21.02551.0381Emu Bay11TEL20.96721.0381Ener (Rowallan)220TFI10.96710.9755George Town (Basslink)220TGT11.00001.0000Gordon220TGT21.00121.055Greater Hobart Area VTN22THN20.98340.9863Hadspen22THN20.98140.9888Hampshire111THR21.03161.0409Kingston33TK121.01451.0409Kingston33TK121.01461.0329Kingston33THR21.01461.0329Kingston22TMN20.99110.9931Meadowbank22TMN20.99110.9931Mowbray22TMN20.99110.9911Newton22TTN20.99110.9911Newton22TTN20.99110.9911North Hobart11TTN30.99140.9914North Hobart11TTN30.99160.9914North Hobart22TTN20.99160.9914North Hobart11TTN30.9916	Burnie	22	TBU3	0.9855	0.9905
Creek Road133TCR21.01401.0276DerhyICR2TDE20.96720.9695Derwnent BridgeIC2TDP20.98840.9390DevonportIC2TDP20.98840.9395ElectronaI11TEL21.02551.0381Erw BayI11TEL20.96270.9875Fisher (Rowalian)220TFI10.96710.9755George Town (Basslink)220TGT11.00001.0000GordonIC2TGT31.00231.0021GordonIC2TTH10.96410.9888HampshireI10THN20.98410.9885Huon RiverI11THR21.03161.0327KingstonI11THR21.03161.0328KingstonI13TK131.01881.0328KingstonI13TK121.01551.0329KingstonI13TK121.01511.0329KingstonI14TK21.03161.0329KingstonI13TK121.01511.0329MowhayI12TM121.01521.0329MowhayI12TM120.98711.0329NortolkI12TM121.01521.0329NortolkI14TK120.98711.0329NortolkI12TM120.98711.0329NortolkI14TM120.98760.9710NortholkI12TM120.98760.9710 </td <td>Chapel St.</td> <td>11</td> <td>TCS3</td> <td>1.0127</td> <td>1.0264</td>	Chapel St.	11	TCS3	1.0127	1.0264
Derby	Comalco	220	TCO1	1.0006	1.0006
Derwent Bridge22TDB20.93680.9390Devonport22TDP20.98640.9896Electrona11TEL20.982910.9814Emu Bay111TED20.98290.9877Fisher (Rowallan)220TF110.96710.9755George Town (Basslink)220TG111.00021.0021George Town (Basslink)220TG120.00011.0000Gordon222TG320.00011.0002Gratter Hobart Area VTNTVN11.01551.0287Hadspen22THA30.99410.9888Hun River110THR21.01651.0287Hadspen22THA30.99410.9888Hun River111TK21.01611.0409Kamande111TK21.01811.0438Kingston111TK21.01831.0323Kingston111TK21.01821.0323Kingston111TK121.01621.0329Mowbray22TMN20.99190.9333Mowbray22TMN20.91700.9710North Hobart111TM130.96070.9710Northold22TM20.96640.9722Que22TM20.96640.9722Que22TM20.96640.9722Que22TM20.96760.9761North Hobart111TM30.96770.9761 </td <td>Creek Road</td> <td>33</td> <td>TCR2</td> <td>1.0140</td> <td>1.0276</td>	Creek Road	33	TCR2	1.0140	1.0276
Devonport122TDP20.98840.9895Electrona111TEL21.02551.0331Erm Bay111TEB20.98270.9877Fisher (Rowallan)220TF110.96711.0021George Town (Basslink)220TG111.00001.0000Gordon220TG111.00001.0000Gordon220TG111.00001.0000Gordon220TH130.99410.9884Hanspehire110TH1020.98340.9868Huon River111TH221.01321.0435Kingston111TK121.01351.0435Kingston111TK121.01631.0329Kingston111TK121.01631.0329Kingston113TK121.01631.0329Mowhary220TM121.01631.0329Mowhary220TM121.01621.0287New Nofolk113TM121.01621.0287North Hobart114TM130.96070.9710North Hobart114TM130.96070.9710North Hobart113TM120.96840.9720Queenstown114TM130.96670.9710North Hobart114TM130.96670.9751Queenstown113TM120.96640.9720Queenstown114TM130.96670.9761Queenstown114TM13<	Derby	22	TDE2	0.9672	0.9695
Electrona11TEL21.02551.0381Erm Bay111TEB20.98290.9877Fisher (Rowallan)220TF110.96710.9755George Town (Basslink)220TGT31.00011.0000Gordon222TG021.01151.0021George Town (Basslink)220TGT11.00001.0000Gordon222TG021.01151.0287Hadspen202TTM10.98340.9865Huon River110THR20.93140.9868Huon River111TK21.03161.0409Kingston111TK21.03181.0409Kingston111TK21.03181.0435Kingston111TK21.01621.0323Kingston111TK21.01691.0321Morington113TK21.03531.0455Lindislame33TLF21.01621.0281Mowbray22TM20.99210.9971Newton22TM20.99260.9711Newton22TM20.99260.9711Newton22TM20.99260.9712Newton22TQU0.99690.9751Newton22TQU0.97680.9751Norwood22TQU0.97680.9751Queenstown22TQU0.97680.9751Queenstown23TR41.01600.9751	Derwent Bridge	22	TDB2	0.9368	0.9390
Emu Bay11TEB20.98290.9877Fisher (Rowallan)220TFI10.96710.9755George Town220TGT31.00231.0021George Town (Basslink)220TGT21.00121.0015Greater Hobart Area VTNTVN11.01551.0287Hadspen22THA30.99410.9888Hampshire110THM20.98340.9865Huon River111THK21.01021.0405Kingston113TKE21.03121.0435Kingston114TKE21.03121.0328Kingston113TKE21.03121.0328Kingston114TKE21.03121.0328Kingston115TLF21.01591.0329Kingston113TLF21.01591.0329Kingston114TKE20.99190.9931Mornington23TLF21.01501.0289Movbray22TM20.99270.9971Newton22TM20.99270.9971Newton22TM20.99260.9971North Hobart111TM30.96070.9712North Hobart22TR120.99260.9974Palmerston22TR20.96640.9722Que22TR20.96640.9725Queenstown22TR20.96640.9725Queenstown22TR20.96640.9726<	Devonport	22	TDP2	0.9884	0.9895
Fisher (Rowallan)220TFI10.96710.9755George Town222TGT31.00231.0021George Town (Basslink)220TGT11.00001.0155Greater Hobart Area VTNTVM11.01551.0221TVM11.0155Hadspen22THA30.99410.9988Hampshire110THM20.98340.9665Huon River111TKE21.03121.0432Kingston33TK131.04881.0323Kingston111TKE21.03131.0485Lindisame33TK121.04921.0435Meadowbark22TME20.99190.9933Mornington33TMT21.01281.0428Newton22TME20.99190.9931Newton22TME20.99270.9971Newton22TM120.91920.9931Nornood22TM20.92620.9974Paireston22TR120.96650.9761Norwood22TR120.96650.9761Queenstown111TM30.90710.9761Norwood22TR20.96670.9763Queenstown22TR20.96670.9763Risdon33TR141.01600.9763Queenstown22TR20.96670.9763Risdon33TR41.01600.9763Risdon33TR141.0160	Electrona	11	TEL2	1.0255	1.0381
George Town (Basslink) 22 TGT3 1.0021 George Town (Basslink) 220 TGT1 1.0000 1.0000 Gordon 222 TGC2 1.0012 1.0155 Greater Hobart Area VTN 22 THA3 0.9941 0.9988 Hadspen 22 THA3 0.9941 0.9986 Huon River 111 THR2 0.9863 1.0409 Kingston 33 TK13 1.0186 1.0423 Kingston 111 TKE2 1.0316 1.0409 Kermandie 111 TKE2 1.0316 1.0323 Kingston 111 TKE2 1.0316 1.0323 Kingston 111 TKE2 1.0313 1.0455 Lindisfarne 33 TLF2 1.0159 1.0316 Mowbray 22 TMB2 0.9919 0.9933 Mowbray 22 TMY2 0.9927 0.9971 New Norfolk 22 TNY2 0.1012 0.9801	Emu Bay	11	TEB2	0.9829	0.9877
George Town (Basslink) 220 TGT1 1.0000 Gordon 22 TGQ2 1.0112 1.0155 Greater Hobart Area VTN 22 THA3 0.9941 0.9988 Hadspen 22 THA3 0.9941 0.9988 Hampshire 110 THR2 0.9384 0.9868 Huon River 111 THR2 1.0312 1.0435 Kingston 33 TK13 1.0188 1.0323 Kingston 111 TKI2 1.0312 1.0435 Kingston 111 TKI2 1.0353 1.0455 Kingston 111 TKI2 1.0353 1.0455 Kingston 111 TKI2 1.0353 1.0455 Moston 22 TMB2 0.9919 0.9933 Morington 33 TMT2 1.0162 1.0244 New Morlok 22 TMN2 1.0128 1.0244 New Morlok 22 TNV2 0.9971 0.9971	Fisher (Rowallan)	220	TFI1	0.9671	0.9755
Gordon22TGO21.00121.0155Greater Hobart Area VTNTVN11.01551.0287Hadspen22THA30.99410.9888Hampshire110THM20.98340.9865Huon River111TKE21.03161.0409Kermandie111TKE21.03161.0323Kingston33TK131.01881.0323Kingston111TKE21.03531.0455Lindisfame33TLF21.01621.0329Koights Road111TKE20.99190.9933Mornington33TMT21.01621.0301Mowbray22TMY20.99270.9971New Norfolk22TNN21.01281.0244Newton22TNN20.99190.9939North Hobart111TNT30.96070.9710North Hobart111TNT30.96070.9710North Hobart111TNT30.96070.9712Queenstown22TRM20.99260.9731Queenstown22TRM20.99260.9735Ridton111TNT30.96070.9712Queenstown22TRM20.99260.9751Ridson111TRT30.96640.9722Queenstown22TRA20.98990.9858Ridson111TRT30.95640.9751Ridson111TRT30.95640.9751<	George Town	22	TGT3	1.0023	1.0021
Greater Hobart Area VTN1.01551.0287Hadspen22THA30.99410.9888Hampshire110THM20.98340.9865Huon River111THR21.03161.0409Kernandie111TKE21.03121.0435Kingston33TK131.01881.0329Kingston111TKE21.01591.0329Kingiston111TKE21.01591.0329Kingiston111TKE21.01591.0329Kingiston111TKE21.01591.0329Kingiston111TKE21.01591.0329Kingiston33TLF21.01591.0301Meadowbank22TME20.99190.9933Mornington33TMT21.01621.0289Newton22TNT20.99270.9971Newton22TNT20.91720.9071North Hobart111TNT30.96070.9710North Hobart22TNT20.92680.9974Palmerston22TQ120.92690.9751Queenstown111TR130.96490.9752Queenstown22TQ120.96290.9687Raiton23TR41.01801.0353Risdon33TR141.01801.0356Risdon33TR141.01801.0356Risdon11TR30.96290.9687Risdon13	George Town (Basslink)	220	TGT1	1.0000	1.0000
Hadspen 22 THA3 0.9941 0.9983 Hampshire 110 THM2 0.9834 0.9865 Huon River 111 THR2 1.0316 1.0409 Kernandie 111 TKE2 1.0312 1.0435 Kingston 33 TK13 1.0188 1.0323 Kingston 111 TKR2 1.0353 1.0435 Lindisfame 33 TLF2 1.0196 1.0329 Mornington 33 TMT2 1.0193 1.0401 New Norfolk 22 TMM2 0.9919 0.9933 Mowbray 22 TMV2 0.9927 0.9971 New Norfolk 22 TMV2 0.9926 0.9974 Newton 11 TMT3 0.90507 0.9710 <	Gordon	22	TGO2	1.0012	1.0155
Hampshire110THM20.98340.9865Huon River111THR21.03161.0409Kermandie111TKE21.03121.0435Kingston33TK131.01881.0323Kingston111TKI21.01961.0329Kingston111TKR21.03531.0455Lindisfame33TLF21.01591.0301Meadowbank23TMT21.01621.0283Mornington33TMT21.01621.0283Nowbray222TMY20.99270.9971New Norfolk222TNN21.01281.0244Newton222TNN20.91210.9609Norwood222TNN20.91210.9609Norwood222TNV20.99260.9971Norwood222TNV20.91210.9609Port Lata222TNV20.99260.9971Queenstown223TQ120.96640.9722Queenstown224TQ120.96690.9730Ridon33TR141.01800.9670Risdon33TR141.01801.0328Risdon33TR141.01801.0328Risdon111TR330.92670.9687Risdon23TR141.01801.0328Risdon111TR330.92690.9687Risdon23TR141.01801.0328Risdon11	Greater Hobart Area VTN		TVN1	1.0155	1.0287
Hun River11THR21.03161.0409Kermandie111TKE21.03121.0435Kingston33TK131.01881.0323Kingston111TKI21.01961.0329Kinghts Road111TKR21.03531.0455Lindisfame33TLF21.01910.0933Mornington33TMT21.01621.0283Mowbray22TMY20.99270.9971New Norfolk22TNY20.91210.9809Newton111TNT30.96070.9710Nornington222TNY20.92620.9971Newton111TNT30.96070.9710North Hobart111TNT30.96070.9710Norwood22TPW20.96640.9722Que22TPW20.96640.9722Queenstown211TQT30.95670.9661Queenstown22TR420.96690.9768Railton22TR420.96990.9895Risdon33TR41.01601.0306Risdon33TR41.01601.0306Risdon33TR420.96290.9689Risdon33TR420.96290.9689Risdon33TR421.01601.0306Risdon33TR41.01601.0306Risdon111TR820.97270.9753Savage River22 <td>Hadspen</td> <td>22</td> <td>THA3</td> <td>0.9941</td> <td>0.9988</td>	Hadspen	22	THA3	0.9941	0.9988
Kermandie11TKE21.03121.0435Kingston33TK131.01881.0323Kingston111TK121.01961.0329Knights Road111TKR21.03531.0455Lindisfame33TLF21.01591.0301Meadowbank22TMB20.99190.9933Mornington33TMT21.01621.0283Mowbray22TMY20.99270.9971New Norfolk22TNN21.01281.0244Newton22TN120.97100.9710North Hobart111TK130.96070.9710Norwood22TN20.99260.9974Palmerston22TPM20.98090.9951Port Latta22TPM30.96070.9710Queenstown111TGT30.96670.9759Queenstown22TQ20.96840.9722Ridon33TR141.01801.0305Risdon33TR141.01801.0305Risdon111TR320.96671.0351Rokeby111TR821.01631.0296Rokeby111TR821.01631.0296Rokeby111TR820.97720.9753Savage River22TS821.01311.0296Soutsdale22TS820.97550.9715Smithton22TS820.97550.9715	Hampshire	110	THM2	0.9834	0.9865
Kingston33TK131.01881.0323Kingston111TKI21.01961.0329Kinghts Road111TKR21.03531.0455Lindisfarne33TLF21.01591.0301Meadowbank22TMB20.99190.9933Mornington33TMT21.01621.0283Mowbray22TMY20.99270.9971New Norfolk22TNT20.97120.9809Newton22TNT20.97120.9809North Hobart111TNT30.96070.9710Northodot22TNW20.99260.9974Palmerston22TPM30.96070.9710Queenstown22TPL20.96640.9722Queenstown22TQU20.97680.9750Queenstown23TR141.01801.0305Risdon111TR130.96670.9750Risdon22TQU20.97680.9750Risdon111TQT30.96460.9720Risdon111TR141.01801.0305Risdon111TR141.01631.0326Rokeby111TR141.01631.0351Rokeby144TR820.97270.9753Savage River22TSD20.97350.9715Smithton22TSD20.97350.9715	Huon River	11	THR2	1.0316	1.0409
Kngston111TK121.01961.0329Knights Road111TKR21.03531.0455Lindisfarne33TLF21.01591.0301Meadowbank22TMB20.99190.9933Mornington33TMT21.01621.0283Mowbray22TMY20.99270.9971New Norfolk22TNN21.01281.0244Newton22TNT20.97120.8809Newton111TNT30.96070.9710North Hobart111TNT30.96070.9710Norwood22TPM20.99260.9974Palmerston22TPM30.96700.9951Port Latta22TPL20.96480.9722Queenstown21TQT20.96290.9675Railton23TR141.01801.0305Risdon111TR131.02281.0351Risdon23TR40.98990.9855Risdon23TR40.98990.9855Risdon111TR131.02281.0351Rokeby111TR131.02281.0351Rokeby111TR141.01631.0276Rosebery24TSR20.91730.9753Savage River22TSR21.00131.0049Sottsdale22TSR20.91730.9751Smithton22TSR20.94330.9574	Kermandie	11	TKE2	1.0312	1.0435
Norm Norm Norm Norm Lindisfame 33 TLF2 1.0155 1.0351 Meadowbank 22 TMB2 0.9919 0.9933 Mornington 33 TMT2 1.0162 1.0283 Mowbray 22 TMY2 0.9927 0.9971 New Norfolk 22 TMY2 0.9927 0.9971 Newton 22 TMY2 0.9927 0.9971 Newton 22 TMY2 0.9927 0.9971 North Hobart 111 TMT3 0.9607 0.9710 Norwood 22 TMV2 0.9124 0.9870 Palmerston 22 TMW2 0.9264 0.9721 Que 22 TQU2 0.9764 0.9751 Queenstown 22 TQU2 0.9664 0.9752 Raiton 22 TQU2 0.9689 0.9687 Risdon 11 TQT3 0.9654 0.9753 Risdon <td< td=""><td>Kingston</td><td>33</td><td>TK13</td><td>1.0188</td><td>1.0323</td></td<>	Kingston	33	TK13	1.0188	1.0323
Normal 33 TLF2 1.0159 1.0301 Meadowbank 22 TMB2 0.9919 0.9933 Mornington 33 TMT2 1.0162 1.0283 Mowbray 22 TMY2 0.9927 0.9971 New Norfolk 22 TMY2 0.9927 0.9971 Newton 22 TMY2 0.9927 0.9971 North Hobart 11 TMT3 0.9607 0.9710 Norwood 22 TMV2 0.9121 0.9809 Palmerston 22 TM2 0.9607 0.9710 Que 22 TPM3 0.9870 0.9911 Que onstown 22 TPM2 0.9664 0.9722 Que onstown 22 TQ2 0.9603 0.9751 Raiton 22 TQ2 0.9629 0.9687 Raiton 22 TR42 0.9899 0.9895 Risdon 11 TR3 1.0228 1.0315 R	Kingston	11	TKI2	1.0196	1.0329
Meadowbank22TMB20.99190.9933Mornington33TMT21.01621.0283Mowbray22TMY20.99270.9971New Norfolk22TNN21.01281.0244Newton22TNT20.97120.9809Newton21TNT30.96070.9710North Hobart11TNT30.96070.9710Norwood22TNW20.99260.9974Palmerston22TPM30.96640.9721Que22TQU20.96640.9722Que22TQU20.96640.9720Queenstown21TQT20.96290.9687Railton22TRA20.98990.9895Risdon11TRI31.02281.031Rokeby11TRK21.01631.0296Rokeby44TRE20.97270.9753Savage River22TSE20.94930.9741Smithton22TSE20.94930.9741	Knights Road	11	TKR2	1.0353	1.0455
Mornington33TMT21.01621.0283Mowbray22TMY20.99270.9971New Norfolk22TNN21.01281.0244Newton22TNT20.97120.9809Newton11TNT30.96070.9710North Hobart111TNH21.01501.0276Norwood22TNW20.99260.9974Palmerston22TPM30.96070.9951Port Latta22TPL20.96640.9722Que enstown22TQ120.96290.9687Queenstown22TQ120.96290.9687Railton22TRA20.98990.9885Risdon33TRI41.01801.0305Risdon11TRI31.02281.0313Rokeby11TRI31.02281.0313Savage River24TSR20.97350.9745Smithton22TSR20.91350.9745	Lindisfarne	33	TLF2	1.0159	1.0301
Mowbray 22 TMY2 0.9927 0.9971 New Norfolk 22 TNN2 1.0128 1.0244 Newton 22 TN2 0.9712 0.9809 Newton 22 TN2 0.9712 0.9809 Newton 11 TN3 0.9607 0.9710 North Hobart 11 TN42 1.0150 1.0276 Norwood 22 TN2 0.9926 0.9974 Palmerston 22 TPM3 0.9870 0.9951 Port Latta 22 TPL2 0.9664 0.9722 Que 22 TQ22 0.964 0.9759 Queenstown 22 TQ22 0.9664 0.9759 Queenstown 22 TQ22 0.9689 0.9689 Risdon 11 TQ3 0.9546 0.9759 Risdon 11 TR42 0.9899 0.9885 Risdon 111 TR13 1.0228 1.0351 Rokeby<	Meadowbank	22	TMB2	0.9919	0.9933
Mowbray22TMY20.99710.9971New Norfolk22TNN21.01281.0244Newton22TNT20.97120.9809Newton11TNT30.96070.9710North Hobart11TNH21.01501.0276Norwood22TNW20.99260.9974Palmerston22TPM30.98700.9951Port Latta22TPL20.96640.9723Que enstown22TQ20.97080.9759Queenstown22TQ20.96240.9687Railton22TR420.98990.9895Risdon33TR141.01801.0305Risdon11TR521.01631.0296Rokeby44TR820.97270.9753Savage River22TS220.93550.9791Smithton22TS20.94930.9574	Mornington	33	TMT2	1.0162	1.0283
Newton22TNT20.97120.9809Newton11TNT30.96070.9710North Hobart111TNH21.01501.0276Norwood22TNW20.99260.9974Palmerston22TPM30.98700.9951Port Latta22TPL20.96640.9722Que22TQU20.97080.9759Queenstown11TQT30.95460.9730Queenstown22TRA20.96990.9687Risdon123TRH21.01631.0305Risdon111TRI31.02281.0351Rokeby111TRK21.01631.0296Savage River22TSD20.97350.9791Smithton22TSD20.97350.9791	Mowbray	22	TMY2	0.9927	0.9971
Newton 11 TNT3 0.9607 0.9710 North Hobart 11 TNT3 0.9607 0.9710 Norwood 22 TNW2 0.9926 0.9974 Palmerston 22 TPM3 0.9870 0.9951 Port Latta 22 TPM3 0.9664 0.9722 Que 22 TQU2 0.9664 0.9723 Queenstown 11 TQT3 0.9546 0.9730 Queenstown 22 TQU2 0.9629 0.9687 Railton 22 TQT2 0.9629 0.9687 Risdon 23 TR4 1.0180 1.0305 Risdon 33 TR4 1.0180 1.0305 Risdon 11 TR3 1.0228 1.0315 Rokeby 11 TR4 0.9677 0.9753 Savage River 24 TR82 0.9727 0.9753 Sottsdale 22 TSR2 1.0013 1.0499 Sn	New Norfolk	22	TNN2	1.0128	1.0244
North Hobart 11 TNH2 1.0150 1.0276 Norwood 22 TNW2 0.9926 0.9974 Palmerston 22 TPM3 0.9870 0.9951 Port Latta 22 TPL2 0.9664 0.9722 Que 22 TQU2 0.9708 0.9759 Queenstown 22 TQU2 0.9708 0.9709 Queenstown 22 TQT2 0.9644 0.9730 Queenstown 22 TQT2 0.9546 0.9730 Railton 22 TQT2 0.9629 0.9687 Risdon 111 TR13 1.0180 1.0305 Risdon 111 TR13 1.0228 1.0316 Rokeby 111 TR12 1.0163 1.0296 Rosebery 44 TR82 0.9727 0.9753 Savage River 22 TSR2 1.0013 1.0049 Scottsdale 22 TSR2 0.9735 0.9774	Newton	22	TNT2	0.9712	0.9809
Norwood22TNW20.99260.9974Palmerston22TPM30.98700.9951Port Latta22TPL20.96640.9722Que22TQU20.97080.9759Queenstown11TQT30.95460.9730Queenstown22TQT20.96290.9687Railton22TRA20.98990.9895Risdon11TR131.0281.0351Rokeby11TRK21.01631.0296Rosebery44TRB20.97270.9753Savage River22TSR21.00131.0049Scottsdale22TSD20.97350.9791	Newton	11	TNT3	0.9607	0.9710
Palmerston22TPM30.98700.9951Port Latta22TPL20.96640.9722Que22TQU20.97080.9759Queenstown11TQT30.95460.9730Queenstown22TQT20.96870.9687Railton22TRA20.98990.9895Risdon33TRI41.01801.0305Risdon111TRI31.02281.0351Rosebery44TRB20.97270.9753Savage River22TSD20.97350.9791Smithon22TSD20.94330.9574	North Hobart	11	TNH2	1.0150	1.0276
Port Latta22TPL20.96640.9722QueCQUTQU20.97080.9730Queenstown11TQT30.95460.9730QueenstownC22TQT20.96290.9687RailtonC22TRA20.98990.9895RisdonC33TRI41.01801.0305RokebyC11TRK21.01631.0296RoseberyC44TRB20.97270.9753Savage RiverC22TSR21.00131.0049ScottsdaleC22TSD20.97350.9791SmithonC22TST20.94930.9574	Norwood	22	TNW2	0.9926	0.9974
QueTQU2TQU20.97080.9759Queenstown11TQT30.95460.9730Queenstown22TQT20.96290.9687Railton22TRA20.98990.9895Risdon33TRI41.01801.0305Risdon11TRI31.02281.0351Rokeby111TRK21.01631.0296Savage River22TSR21.00131.0049Scottsdale22TSD20.97350.9791Smithton22TST20.94930.9574	Palmerston	22	TPM3	0.9870	0.9951
Queenstown11TQT30.95460.9730Queenstown22TQT20.96290.9687Railton22TRA20.98990.9895Risdon33TRI41.01801.0305Risdon111TRI31.02281.0351Rokeby111TRK21.01631.0296Savage River22TSR21.01131.0491Scottsdale22TSD20.97350.9791Smithton22TST20.94930.9574	Port Latta	22	TPL2	0.9664	0.9722
Queenstown22TQT20.96290.9687Railton22TRA20.98990.9895Risdon33TRI41.01801.0305Risdon111TRI31.02281.0351Rokeby111TRK21.01631.0296Rosebery444TRB20.97270.9753Savage River22TSR21.00131.0049Scottsdale22TSD20.97350.9791	Que	22	TQU2	0.9708	0.9759
Railton22TRA20.98990.9895Risdon33TRI41.01801.0305Risdon11TRI31.02281.0351Rokeby11TRK21.01631.0296Rosebery44TRB20.97270.9753Savage River22TSR21.01131.0049Scottsdale22TSD20.97350.9791Smithton22TST20.94930.9574	Queenstown	11	TQT3	0.9546	0.9730
Risdon33TRI41.01801.0305Risdon111TRI31.02281.0351Rokeby11TRK21.01631.0296Rosebery44TRB20.97270.9753Savage River22TSR21.00131.0049Scottsdale22TSD20.97350.9791Smithton22TST20.94930.9574	Queenstown	22	TQT2	0.9629	0.9687
Risdon11TRI31.02281.0351Rokeby11TRK21.01631.0296Rosebery44TRB20.97270.9753Savage River22TSR21.00131.0049Scottsdale22TSD20.97350.9791Smithton22TST20.94930.9574	Railton	22	TRA2	0.9899	0.9895
Rokeby11TRK21.01631.0296Rosebery44TRB20.97270.9753Savage River22TSR21.00131.0049Scottsdale22TSD20.97350.9791Smithton22TST20.94930.9574	Risdon	33	TRI4	1.0180	1.0305
Rosebery 44 TRB2 0.9727 0.9753 Savage River 22 TSR2 1.0013 1.0049 Scottsdale 22 TSD2 0.9735 0.9791 Smithton 22 TST2 0.9493 0.9574	Risdon	11	TRI3	1.0228	1.0351
Savage River 22 TSR2 1.0013 1.0049 Scottsdale 22 TSD2 0.9735 0.9791 Smithton 22 TST2 0.9493 0.9574	Rokeby	11	TRK2	1.0163	1.0296
Scottsdale 22 TSD2 0.9735 0.9791 Smithton 22 TST2 0.9493 0.9574	Rosebery	44	TRB2	0.9727	0.9753
Smithton 22 TST2 0.9493 0.9574	Savage River	22	TSR2	1.0013	1.0049
	Scottsdale	22	TSD2	0.9735	0.9791
Sorell 22 TSO2 1.0239 1.0365	Smithton	22	TST2	0.9493	0.9574
	Sorell	22	TSO2	1.0239	1.0365



Location	Voltage (kV)	TNI	2017-18 MLF	2016-17 MLF
St Leonard	22	TSL2	0.9915	0.9964
St. Marys	22	TSM2	1.0165	1.0435
Starwood	110	TSW1	1.0009	1.0008
Tamar Region VTN		TVN2	0.9938	0.9982
Temco	110	TTE1	1.0039	1.0037
Trevallyn	22	TTR2	0.9931	0.9980
Triabunna	22	TTB2	1.0382	1.0533
Tungatinah	22	TTU2	0.9367	0.9417
Ulverstone	22	TUL2	0.9868	0.9888
Waddamana	22	TWA2	0.9537	0.9667
Wayatinah	11	TWY2	0.9979	1.0079
Wesley Vale	22	TWV2	0.9863	0.9810

Table 16 Tasmania Generation

Location	Voltage (kV)	DUID	Connection Point ID	TNI	2017-18 MLF	2016-17 MLF
Basslink (George Town)	220	BLNKTAS	TGT11	TGT1	1.0000	1.0000
Bastyan	220	BASTYAN	TFA11	TFA1	0.9486	0.9496
Bell Bay No.3	110	BBTHREE1	TBB11	TBB1	1.0001	1.0001
Bell Bay No.3	110	BBTHREE2	TBB12	TBB1	1.0001	1.0001
Bell Bay No.3	110	BBTHREE3	TBB13	TBB1	1.0001	1.0001
Bluff Point and Studland Bay Wind Farms	110	WOOLNTH1	TST11	TST1	0.9025	0.9120
Butlers Gorge	110	BUTLERSG	TBG11	TBG1	0.9216	0.9399
Catagunya	220	LI_WY_CA	TLI11	TLI1	0.9919	1.0028
Cethana	220	CETHANA	TCE11	TCE1	0.9630	0.9723
Cluny	220	CLUNY	TCL11	TCL1	0.9908	1.0055
Devils gate	110	DEVILS_G	TDG11	TDG1	0.9703	0.9700
Fisher	220	FISHER	TFI11	TFI1	0.9671	0.9755
Gordon	220	GORDON	TGO11	TGO1	0.9594	0.9676
John Butters	220	JBUTTERS	TJB11	TJB1	0.9445	0.9456
Lake Echo	110	LK_ECHO	TLE11	TLE1	0.9487	0.9360
Lemonthyme	220	LEM_WIL	TSH11	TSH1	0.9711	0.9749
Liapootah	220	LI_WY_CA	TLI11	TLI1	0.9919	1.0028
Mackintosh	110	MACKNTSH	TMA11	TMA1	0.9402	0.9367
Meadowbank	110	MEADOWBK	TMB11	TMB1	0.9770	0.9756
Musselroe	110	MUSSELR1	TDE11M	TDE1	0.9133	0.9193
Paloona	110	PALOONA	TPA11	TPA1	0.9668	0.9754
Poatina	220	POAT220	TPM11	TPM1	0.9813	0.9929
Poatina	110	POAT110	TPM21	TPM2	0.9677	0.9824
Reece No.1	220	REECE1	TRCA1	TRCA	0.9399	0.9413
Reece No.2	220	REECE2	TRCB1	TRCB	0.9402	0.9390
Repulse	220	REPULSE	TCL12	TCL1	0.9908	1.0055
Rowallan	220	ROWALLAN	TFI12	TFI1	0.9671	0.9755
Tamar Valley CCGT	220	TVCC201	TTV11A	TTV1	1.0000	1.0000





Location	Voltage (kV)	DUID	Connection Point ID	TNI	2017-18 MLF	2016-17 MLF
Tamar Valley OCGT	110	TVPP104	TBB14A	TBB1	1.0001	1.0001
Tarraleah	110	TARRALEA	TTA11	TTA1	0.9338	0.9453
Trevallyn	110	TREVALLN	TTR11	TTR1	0.9898	0.9927
Tribute	220	TRIBUTE	TTI11	TTI1	0.9466	0.9437
Tungatinah	110	TUNGATIN	TTU11	TTU1	0.9233	0.9091
Wayatinah	220	LI_WY_CA	TLI11	TLI1	0.9919	1.0028
Wilmot	220	LEM_WIL	TSH11	TSH1	0.9711	0.9749

Table 17 Tasmania Embedded Generation

Location	Voltage [kV]	DUID	Connection Point ID	TNI	2017-18 MLF	2016-17 MLF
Midlands PS	22	MIDLDPS1	TAV21M	TAV2	1.0017	1.0301
Remount	22	REMOUNT	TMY21	TVN2	0.9938	0.9982



2. CHANGES IN MARGINAL LOSS FACTORS

This section summarises the changes in MLFs for 2017–18 from the 2016–17 MLFs, and the trends driving them.

The following major trends in the NEM caused changes in MLFs in 2017–18 from 2016–17:

- Retirement of Hazelwood Power Station (PS) in Victoria.
- Decreased forecast consumption in Southern Queensland, in particular decreased consumption in production of LNG, and other major industrial load forecasts.
- Increased regional consumption forecast in NSW and Victoria.
- Decreased regional consumption forecast in Queensland, South Australia and Tasmania.
- Increased hydro generation forecast in Tasmania.
- Increased in installed wind capacity in South Australia.
- Forecast reduction in Basslink power transfers from Victoria to Tasmania.

These major trends dictated the following changes in modelled net power transfer on interconnectors:

- Increased power flow from Queensland to NSW when compared to the 2016-17 MLF study.
- Increased power from NSW to Victoria when compared to the 2016-17 MLF study.
- Reduced power flow from Victoria to South Australia when compared to the 2016-17 MLF study.
- Reduced power flow from Victoria to Tasmania when compared to the 2016-17 MLF study.

These changes have a consequent effect on MLFs, in particular at locations geographically close to interconnectors.

2.1 Changes to Marginal Loss Factors in Queensland

The 2017-18 Queensland region consumption forecast is 6.1% lower than the 2016-17 forecast used in 2016-17 MLF calculations. The decrease is largely due to the decrease in LNG and other major industrial load forecasts in central and southern Queensland⁶. This along with reduced generation in Victoria due to the retirement of Hazelwood PS, has led to an increase in Queensland generation and exports when compared to the 2016-17 MLF study.

These two factors have resulted in an increase in power flow from central Queensland toward the regional reference node; hence there is a general reduction in MLFs at connection points in Central and Northern Queensland.

Figure 1 shows the changes to MLFs at Queensland connection points in the 2017-18 study compared to the previous year.

⁶ Forecast Operational consumption – as sent out. It was sourced from the 2016 NEFR Report, and the update to the report. See link http://www.aemo.com.au/Electricity/National-Electricity-Market-NEM/Planning-and-forecasting/National-Electricity-Forecasting-Report



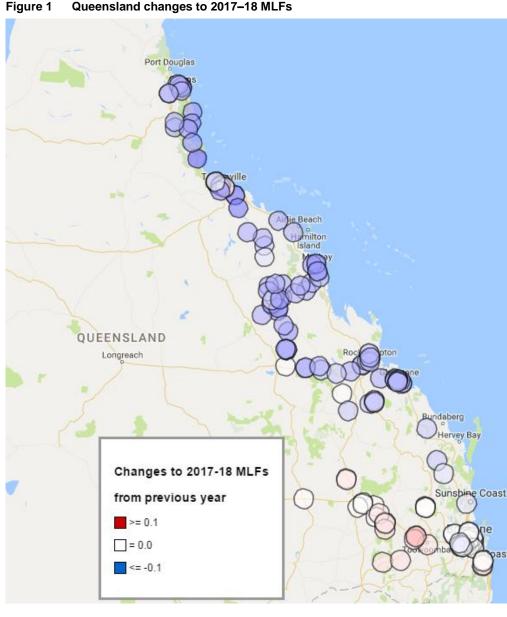


Figure 1 Queensland changes to 2017-18 MLFs

Changes to Marginal Loss Factors in NSW 2.2

The NSW energy consumption forecast for 2017-18 has increased by 0.5% when compared to the 2016-17 MLF study⁶. Generation in Victoria has reduced when compared to the 2016-17 MLF study due to retirement of Hazelwood PS. This has driven an increase in NSW generation, and an increase in NSW export to Victoria. As a result:

- MLFs at connection points in Southern NSW have increased due to anticipated increased power exports to Victoria.
- MLFs at connection points in Northern NSW have reduced due to anticipated increased power imports from Queensland.

Figure 2 shows the changes to MLFs at NSW connection points in the 2017–18 study compared to the previous year.



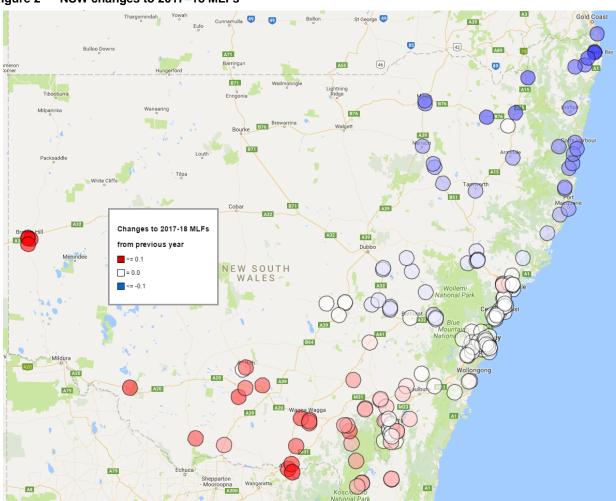


Figure 2 NSW changes to 2017–18 MLFs

2.3 Changes to Marginal Loss Factors in Victoria

Victoria's energy consumption forecast for 2017-18 has increased by 0.17% when compared to the 2016-17 MLF study⁶. Hazelwood PS is due to be retired at the end of March 2017. To balance supply and demand, an anticipated increase in imports into Victoria and an increase in generation in the Latrobe Valley was modelled.

Forecast generation in Tasmania has increased by 3.1% when compared to the 2016-17 MLF study (refer to section B.3.3). This has resulted in reduced transfers from Victoria to Tasmania in the MLF model.

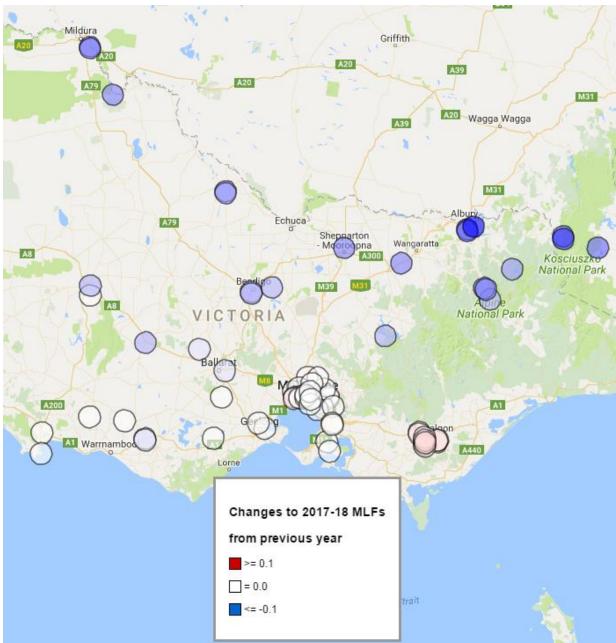
In general, Victoria is forecast to export less energy to Tasmania and South Australia, and import more energy from NSW in 2017-18 compared to the 2016-17 MLF study. As a result:

- MLFs at connection points near the Victoria-NSW interconnector have reduced along with increased power transfers from NSW to Victoria.
- MLFs at connection points near the Victoria-SA interconnector have reduced due to reduced power transfers from Victoria to South Australia.

a



Figure 3 shows the changes to MLFs at Victorian connection points in the 2017–18 study compared to the previous year.







2.4 Changes to Marginal Loss Factors in South Australia

The South Australian energy consumption forecast for 2017-18 has reduced by 3.2% when compared to the 2016-17 MLF study⁶. The forecast imports from Victoria to South Australia have also reduced due to the retirement of Hazelwood PS. As a result:

- MLFs at connection points in South East South Australia and in the Riverland have increased due to reduced power transfers from Victoria to South Australia.
- MLFs at connection points in Northern South Australia have decreased due to increased wind generation at Hornsdale wind farm.

Figure 4 shows the changes to MLFs at South Australian connection points in the 2017–18 study compared to the previous year.

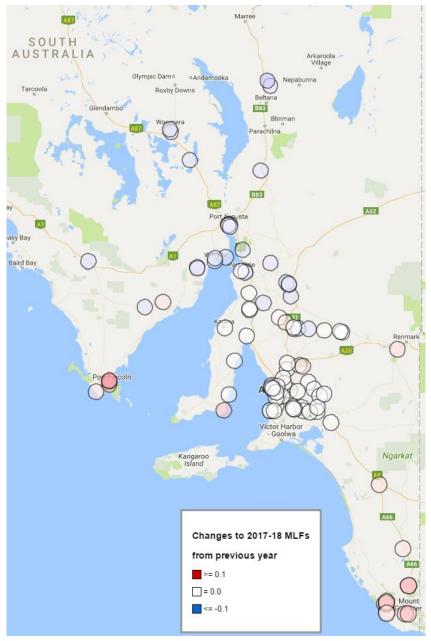


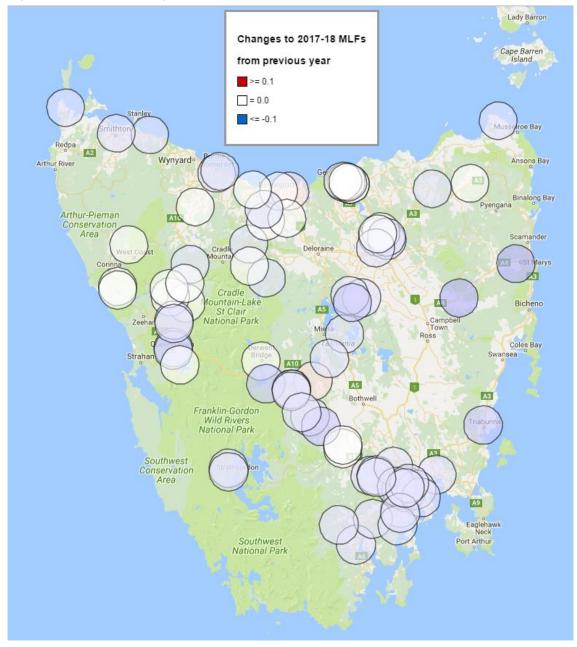
Figure 4 South Australia changes to 2017–18 MLFs



2.5 Changes to Marginal Loss Factors in Tasmania

The Tasmanian energy consumption forecast for 2017-18 has reduced when compared to the 2016-17 MLF study⁶. Forecast generation in Tasmania has increased (refer to section B.3.3), resulting in reduced imports from Victoria via Basslink. Consequently there has been a general decrease in MLFs in Tasmania.

Figure 5 shows the changes to MLFs at Tasmanian connection points in the 2017–18 study compared to the previous year.







3. INTER-REGIONAL LOSS FACTOR EQUATIONS

This section describes inter-regional loss factor equations.

Inter-regional loss factor equations describe the variation in loss factor at one regional reference node (RRN) with respect to an adjacent RRN. These equations are necessary to cater for the large variations in loss factors that may occur between RRNs as a result of different power flow patterns. This is important in minimising the distortion of economic dispatch of generating units.

Loss factor equation (South Pine 275 referred to Sydney West 330)

= 0.9618 + 1.9372E-04*NQt - 1.3618E-06*Nd + 1.2071E-05*Qd

Loss factor equation (Sydney West 330 referred to Thomastown 66)

= 1.0285 + 1.4963E-04*VNt - 2.4526E-05*Vd + 9.9748E-06*Nd - 6.1947E-06*Sd

Loss factor equation (Torrens Island 66 referred to Thomastown 66)

= 1.0154 + 3.3384E-04*VSAt - 2.5314E-06*Vd + 1.4872E-05*Sd

Where:

Qd = Queensland demand

Vd = Victorian demand

- Nd = NSW demand
- Sd = South Australian demand
- NQt = transfer from NSW to Queensland
- VNt = transfer from Victoria to NSW
- VSAt = transfer from Victoria to South Australia

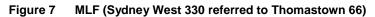




Figure 6 MLF (South Pine 275 referred to Sydney West 330)

Table 18 South Pine 275 referred to Sydney West 330 MLF versus NSW to Queensland flow Coefficient statistics

Coefficient	Q _d	N _d	NQt	CONSTANT
Coefficient value	1.2071E-05	-1.3618E-06	1.9372E-04	0.9618
Standard error values for the coefficients	1.2920E-07	8.0919E-08	2.4359E-07	5.5863E-04
Coefficient of determination (R ²)	0.9794			
Standard error of the y estimate	0.0089			



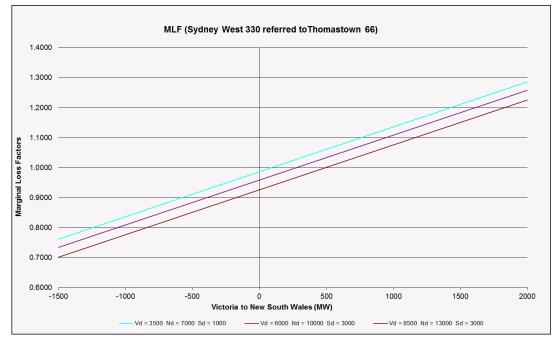




Table 19 Sydney West 330 referred to Thomastown 66 MLF versus Victoria to NSW flow Coefficient statistics

Coefficient	Sd	N _d	V _d	VNt	CONSTANT
Coefficient value	-6.1947E-06	9.9748E-06	-2.4526E-05	1.4963E-04	1.0285
Standard error values for the coefficients	9.8264E-07	2.8001E-07	4.4991E-07	3.5305E-07	1.1741E-03
Coefficient of determination (R ²)	0.9247				
Standard error of the y estimate	0.0238				

Figure 8 MLF (Torrens Island 66 referred to Thomastown 66)

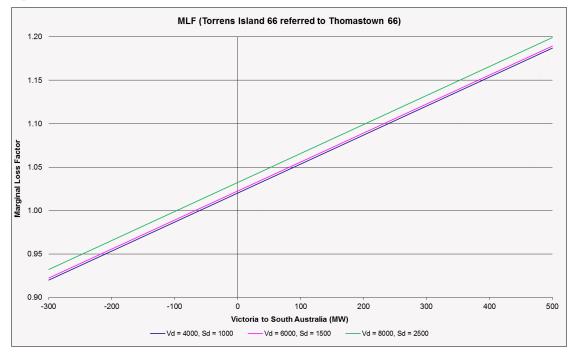


Table 20 Torrens Island 66 referred to Thomastown 66 MLF versus Victoria to South Australia flow Coefficient statistics

Coefficient	Sd	Vd	VSAt	CONSTANT
Coefficient value	1.4872E-05	-2.5314E-06	3.3384E-04	1.0154
Standard error values for the coefficients	7.4565E-07	2.2896E-07	6.5518E-07	7.4770E-04
Coefficient of determination (R2)	0.9416			
Standard error of the y estimate	0.0175			



4. INTER-REGIONAL LOSS EQUATIONS

This section describes how inter-regional loss equations are derived.

Inter-regional loss equations are derived by integrating the equation (Loss factor – 1) with respect to the interconnector flow, i.e.:

Losses = $\int (Loss factor - 1) dFlow$

South Pine 275 referred to Sydney West 330 notional link average losses

= (-0.0382 - 1.3618E-06*Nd + 1.2071E-05*Qd)*NQt + 9.6858E-05*NQt²

Sydney West 330 referred to Thomastown 66 notional link average losses

= (0.0285 - 2.4526E-05*Vd + 9.9748E-06*Nd - 6.1947E-06*Sd)*VNt + 7.4815E-05*VNt²

Torrens Island 66 referred to Thomastown 66 notional link average losses

= (0.0154 - 2.5314E-06*Vd + 1.4872E-05*Sd)*VSAt + 1.6692E-04*VSAt²

Where:

- Qd = Queensland demand
- Vd = Victorian demand
- Nd = NSW demand
- Sd = South Australia demand
- NQt = transfer from NSW to Queensland
- VNt = transfer from Victoria to NSW
- VSAt = transfer from Victoria to South Australia



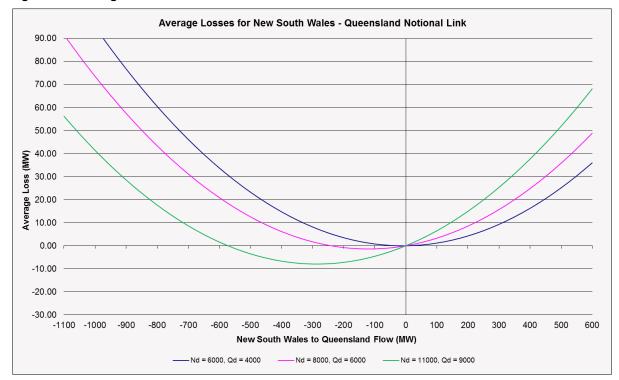
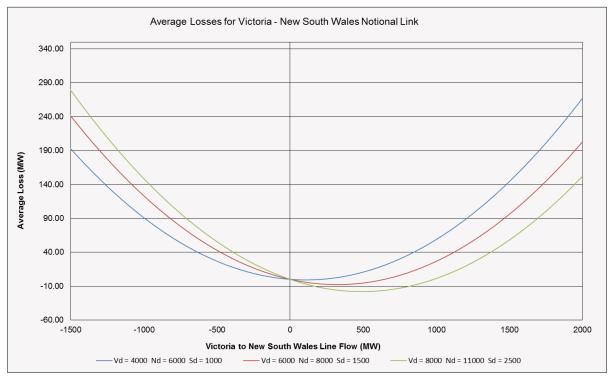


Figure 9 Average Losses for New South Wales - Queensland Notional Link

NSW to Queensland notional link losses versus NSW to Queensland notional link flow

Figure 10 Average Losses for Victoria - New South Wales Notional Link



Victoria to NSW notional link losses versus Victoria to NSW notional link flow



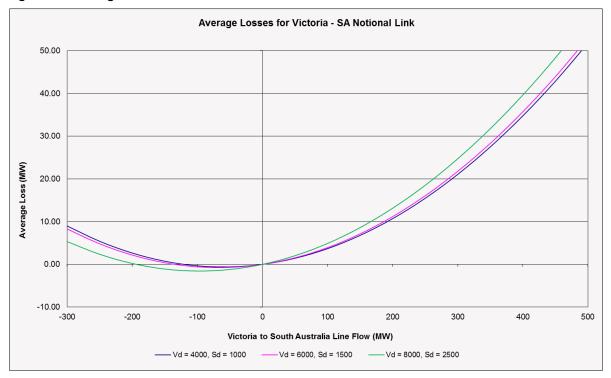


Figure 11 Average Losses for Victoria – SA National Link

Victoria to South Australia notional link losses versus Victoria to South Australia notional link flow



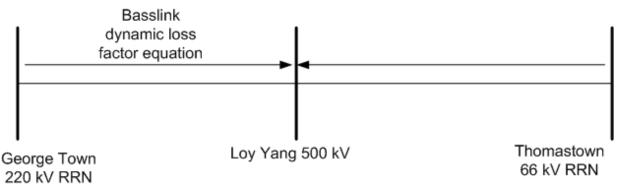
5. BASSLINK, TERRANORA, MURRAYLINK LOSS EQUATIONS

This section describes the loss equations for the DC interconnectors.

5.1 Basslink

The loss factor model for Basslink is made up of the following parts:

- George Town 220 kV MLF referred to Tasmania RRN = 1.0000
- Basslink (Loy Yang PS Switchyard) 500 kV MLF referred to Victorian RRN = 0.9874.
- Receiving end dynamic loss factor referred to the sending end = $0.99608 + 2.0786 * 10^{-4} * P(receive)$, where P(receive) is the Basslink flow measured at the receiving end.



The equation describing the losses between the George Town 220 kV and Loy Yang 500 kV connection points can be determined by integrating the (loss factor equation – 1), giving:

 $P(send) = P(receive) + [(-3.92x10^{-3}) * P(receive) + (1.0393x10^{-4}) * P(receive)^{2} + 4]$

Where:

P(send) : Power in MW measured at the sending end,

P(receive): Power in MW measured at the receiving end.

The model is limited from 40MW to 630MW. When the model falls below 40MW, this is within the \pm 50 MW 'no-go zone' requirement for Basslink operation.



5.2 Murraylink

Murraylink is a regulated interconnector. In accordance with clause 3.6.1(a) of the Rules, the Murraylink loss model consists of a single dynamic MLF from the Victorian RRN to the South Australian RRN.

The measurement point is the 132 kV connection to the Monash converter, which effectively forms part of the boundary between the Victorian and South Australian regions.

The losses between the Red Cliffs 220 kV and Monash 132 kV connection points is given by the following equation:

Losses = $(0.0039 * Flow_t + 2.8177 * 10^{-4} * Flow_t^2)$

AEMO determined the following Murraylink MLF model using regression analysis:

Murraylink MLF (Torrens Island 66 referred to Thomastown 66) = 1.0312 + 2.5951E-03*Flow_t

This model, consisting of a constant and a Murraylink flow coefficient, is suitable because most of the loss is due to variations in the Murraylink flow, and other potential variables do not improve the model.

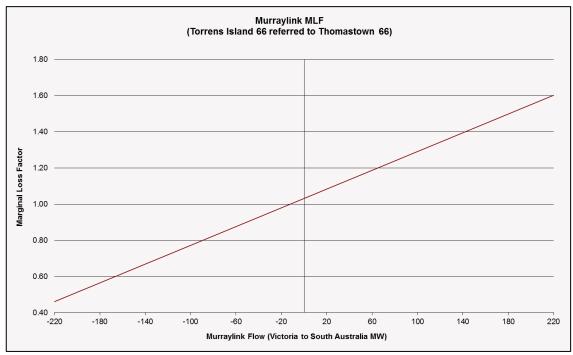
The regression statistics for this Murraylink loss factor model are presented in the following table:

Coefficient	Flow _t	CONSTANT
Coefficient Value	2.5951E-03	1.0312
Standard error values for the coefficient	3.7691E-06	3.9769E-04
Coefficient of determination (R2)	0.9643	
Standard error of the y estimate	0.0354	

The loss model for a regulated Murraylink interconnector can be determined by integrating (MLF-1), giving:

Murraylink loss = 0.0312*Flow_t + 1.2975E-03*Flow_t²

Figure 12	Murraylink MLF	(Torrens Island 66 referred to Thomastown 66)
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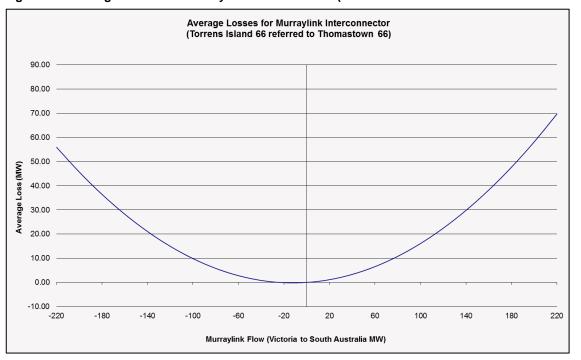


Figure 13 Average Losses for Murraylink Interconnector (Torrens Island 66 referred to Thomastown 66)

Murraylink notional link losses versus Murraylink flow (Victoria to South Australia)



5.3 Terranora

Terranora is a regulated interconnector. In accordance with clause 3.6.1(a) of the Rules, the Terranora loss model consists of a single dynamic MLF from the NSW RRN to the Queensland RRN.

The measurement point is 10.8 km north from Terranora on the two 110 kV lines between Terranora and Mudgeeraba, which effectively forms part of the boundary between the NSW and Queensland regions.

The losses between the Mullumbimby 132 kV and Terranora 110 kV connection points are given by the following equation:

Losses = $(-0.0013 * Flow_t + 2.7372 * 10^{-4} * Flow_t^2)$

AEMO determined the following Terranora MLF model using regression analysis:

Terranora interconnector MLF (South Pine 275 referred to Sydney West 330) = 1.0613 + 1.9227E-03*Flow^t.

This model consisting of a constant and a Terranora flow coefficient is suitable because most of the loss is due to variations in the Terranora flow and other potential variables do not improve the model.

The regression statistics for this Terranora loss factor model are presented in the following table:

Table 22 Regression statistics for Terranora

Coefficient	Flow _t	CONSTANT
Coefficient Value	1.9227E-03	1.0613
Standard error values for the coefficient	4.1573E-06	6.6127E-04
Coefficient of determination (R2)	0.9241	
Standard error of the y estimate	0.0286	

The loss model for a regulated Terranora interconnector can be determined by integrating (MLF-1), giving:

Terranora loss = 0.0613*Flow_t + 9.6134E-04*Flow_t²



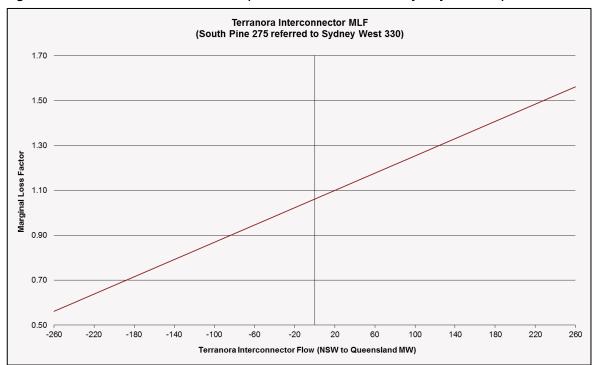


Figure 14 Terranora Interconnector MLF (South Pine 275 referred to Sydney West 330)

South Pine 275 referred to Sydney West 330 MLF versus Terranora interconnector flow (NSW to Queensland)

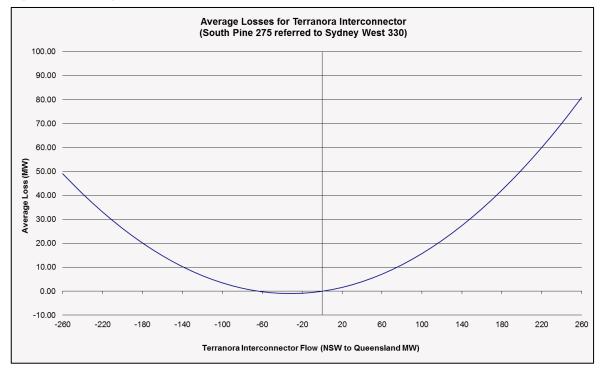


Figure 15 Average Losses for Terranora Interconnector (South Pine 275 referred to Sydney West 330)

Terranora interconnector notional link losses versus flow (NSW to Queensland)



6. PROPORTIONING OF INTER-REGIONAL LOSSES TO REGIONS

This section details how the inter-regional losses are proportioned by the National Electricity Market Dispatch Engine (NEMDE).

NEMDE implements inter-regional loss factors by allocating the inter-regional losses to the two regions associated with a notional interconnector.

The proportioning factors are used to portion the inter-regional losses to two regions by an increment of load at one RRN from the second RRN. The incremental changes to the inter-regional losses in each region are found from changes to interconnector flow and additional generation at the second RRN.

The average proportion of inter-regional losses in each region constitutes a single static loss factor.

The following table provides the factors used to portion inter-regional losses to the associated regions for the 2017–18 financial year:

Table 23 Factors for inter-regional losses

Notional interconnector	Proportioning factor	Applied to
Queensland – NSW (QNI)	0.62	NSW
Queensland – NSW (Terranora Interconnector)	0.61	NSW
Victoria – NSW	0.20	Victoria
Victoria – South Australia (Heywood)	0.44	Victoria
Victoria – South Australia (Murraylink)	0.65	Victoria



7. REGIONS AND REGIONAL REFERENCE NODES

This section describes the NEM regions, the RRN for each region and regional boundaries.

7.1 Regions and Regional Reference Nodes

Table 24 Regions and Regional Reference Nodes

Region	Regional Reference Node
Queensland	South Pine 275kV node
NSW	Sydney West 330kV node
Victoria	Thomastown 66kV node
South Australia	Torrens Island PS 66kV node
Tasmania	George Town 220 kV node

7.2 Region boundaries

Physical metering points defining the region boundaries are at the following locations.

7.2.1 Between the Queensland and NSW regions

- At Dumaresq Substation on the 8L and 8M Dumaresq to Bulli Creek 330kV lines;7
- 10.8km north of Terranora on the two 110kV lines between Terranora and Mudgeeraba (lines 757 & 758). Metering at Mudgeeraba adjusted for that point.

7.2.2 Between the NSW and Victoria regions

- At Wodonga Terminal Station (WOTS) on the 060 Wodonga to Jindera 330kV line;
- At Red Cliffs Terminal Station (RCTS) on the Red Cliffs to Buronga 220kV line;
- At Murray Switching Station on the MSS to UTSS 330kV lines;
- At Murray Switching Station on the MSS to LTSS 330kV line;
- At Guthega Switching Station on the Guthega to Jindabyne PS 132kV line;
- At Guthega Switching Station on the Guthega to Geehi Dam Tee 132kV line.

7.2.3 Between the Victoria and South Australia regions

- At South East Switching Station (SESS) on the SESS to Heywood 275kV lines.
- At Monash Switching Station (MSS) on the Berri (Murraylink) converter 132kV line.

7.2.4 Between the Victoria and Tasmania regions

Basslink is not a regulated interconnector, it has the following metering points:

- At Loy Yang 500 kV PS.
- At George Town 220 kV Switching Station.



8. VIRTUAL TRANSMISSION NODES

This section shows the configuration of the different virtual transmission nodes (VTNs).

VTNs are aggregations of transmission nodes for which a single MLF is applied. AEMO has considered the following VTNs approved by the Australian Energy Regulator (AER).

8.1 NSW Virtual Transmission Nodes

VTN TNI code	Description	Associated transmission connection points (TCPs)
NEV1	Far North	Muswellbrook 132 and Liddell 33
NEV2	North of Broken Bay	Brandy Hill 11, Kurri 11, Kurri 33, Kurri 132, Newcastle 132, Munmorah 330, Lake Munmorrah 132, Vales Pt. 132, Beresfield 33, Charmhaven 11, Gosford 33, Gosford 66, West Gosford 11, Ourimbah 33, Ourimbah 66, Ourimbah 132, Tomago 132, Tuggerah 132, Somersby 11, BHP Waratah 132 and Wyong 11
NEV3	South of Broken Bay	Sydney North 132 (Ausgrid), Lane Cove 132, Meadowbank 11, Mason Park 132, Homebush Bay 11, Chullora 132 kV, Peakhurst 33, Drummoyne 11, Rozelle 33, Pyrmont 132, Pyrmont 33, Marrickville 11, St Peters 11, Beaconsfield West 132, Canterbury 33, Bunnerong 33, Bunnerong 132, Sydney East 132, Sydney West 132 (Ausgrid) and Sydney South 132, Macquarie Park 11, Rozelle 132, Top Ryde 11, RookWood Road 132, Kurnell 132, Belmore Park 132, Green Square 11, Carlingford 132, Hurstville North 11, Kogorah 11, and Haymarket 132
AAVT ⁷	ACT	Angle Crossing 132, Belconnen 132, City East 132, Civic 132, East Lake 132, Gilmore 132, Gold Creek 132, Latham 132, Telopia Park 132, Theodore 132, Wanniassa 132, Woden 132

Table 25 NSW Virtual Transmission Nodes

8.2 South Australia Virtual Transmission Nodes

The SJP1 VTN for South Australia includes all South Australian load transmission connection points, excluding:

- Snuggery Industrial, as nearly its entire capacity services an industrial facility at Millicent.
- Whyalla MLF, as its entire capacity services an industrial plant in Whyalla.

8.3 Tasmania Virtual Transmission Nodes

VTN TNI code	Description	Associated transmission connection points (TCPs)
TVN1	Greater Hobart Area	Chapel Street 11, Creek Road 33, Lindisfarne 33, Mornington 33, North Hobart 11, Risdon 33 and Rokeby 11.
TVN2	Tamar Region	Hadspen 22, Mowbray 22, Norwood 22, St Leonards 22, Trevallyn 22, George Town 22

Table 26 Tasmania Virtual Transmission Nodes

⁷ The AAVT VTN will become effective once the 12 new TNIs in the ActewAGL network are registered and in commercial operation.



APPENDIX A. BACKGROUND TO MARGINAL LOSS FACTORS

This section summarises the method and interpretation AEMO uses to account for electrical losses in the NEM. It also specifies AEMO's Rules responsibilities related to regions, calculation of MLFs, and calculation of inter-regional loss factor equations.

The NEM uses marginal costs to set electricity prices that need to include pricing of transmission electrical losses.

For electricity transmission, electrical losses are a transport cost that needs to be recovered. A feature of electrical losses is that they also increase with an increase in the electrical power transmitted. That is, the more a transmission line is loaded, the higher the percentage losses. Thus, the price differences between the sending and receiving ends is not determined by the average losses, but by the marginal losses of the last increment of electrical power delivered.

Electrical power in the NEM is traded through the spot market managed by AEMO. The central dispatch process schedules generation to meet demand to maximise the value of trade.

Static MLFs represent intra-regional electrical losses of transporting electricity between a connection point and the RRN. In the dispatch process, generation prices within each region are adjusted by MLFs to determine dispatch of generation.

Dynamic inter-regional loss factor equations calculate losses between regions. Depending on flows between regions, inter-regional losses also adjust the prices in determining generation dispatch to meet demand.

AEMO calculates the Regional Reference Price (RRP) for each region, which is then adjusted by reference to the MLFs between customer connection points and the RRN.

A.1 Rules requirements for the Marginal Loss Factor calculation

Clause 2A.1.3 of the Rules requires AEMO to establish, maintain, review and publish by 1 April each year a list of regions, RRNs, and the market connection points (represented by TNIs) in each region.

Rule 3.6 of the Rules requires AEMO to calculate the inter-regional loss factor equations (clause 3.6.1) and intra-regional loss factors (MLFs) (clause 3.6.2) by 1 April each year that will apply for the next financial year.

Clauses 3.6.1, 3.6.2 and 3.6.2(A) specify the requirements for calculating the inter-regional loss factor equations and MLFs, and the data used in the calculation.

The Rules require AEMO to calculate and publish a single, volume-weighted average, intra-regional MLF for each connection point. The Rules also require AEMO to calculate and publish dual MLFs for connection points where one MLF does not satisfactorily represent transmission network losses for active energy generation and consumption.

A.2 Interpretation of Marginal Loss Factors

Under marginal pricing, the spot price for electricity is the incremental cost of additional generation (or demand reduction) for each spot market trading interval.

Consistent with this, the marginal losses are the incremental increase in total losses for each incremental additional unit of electricity. The MLF of a connection point represents the marginal losses to deliver electricity to that connection point from the RRN.



The tables in section 1 show the MLFs for each region. The price of electricity at a TNI is the price at the RRN multiplied by the MLF. Depending on network and loading configurations MLFs vary, ranging from below 1.0 to above 1.0.

A.2.1 Marginal Loss Factors greater than 1.0

At any instant at a TNI, the marginal value of electricity will equal the cost of generating additional electrical power at the RRN and transmitting it to that point. Any increase or decrease in total losses is then the marginal loss associated with transmitting electricity from the RRN to this TNI. If the marginal loss is positive, less power can be taken from this point than at the RRN, the difference having been lost in the network. In this case, the MLF is above 1.0. This typically applies to loads but would also apply to generation in areas where the local load is greater than the local level of generation.

For example, a generating unit supplying an additional 1 MW at the RRN may find that a customer at a connection point can only receive an additional 0.95 MW. Marginal losses are 0.05 MW, or 5% of generation, resulting in an MLF of 1.05.

A.2.2 Marginal Loss Factors less than 1.0

Losses increase with distance, so the greater the distance between the RRN and a connection point, the higher the MLF. However additional line flow only raises total losses if it moves in the same direction as existing net flow. At any instant, when additional flow is against net flow, total network losses are reduced. In this case, the MLF is below 1.0. This typically applies to generation but would also apply to loads in areas where the local generation level is greater than local load.

Using the example above, if net flow is in the direction from the connection point to the RRN, a generating unit at the RRN is only required to supply an additional 0.95 MW to meet an additional load of 1 MW at the connection point. Marginal losses are then -0.05 MW, or 5% reduction in generation, resulting in an MLF of 0.95.

A.2.3 Marginal Loss Factors impact on National Electricity Market settlements

For settlement purposes, the value of electricity purchased or sold at a connection point is multiplied by the connection point MLF. For example:

A Market Customer at a connection point with an MLF of 1.05 purchases \$1000 of electricity. The MLF of 1.05 multiplies the purchase value to $1.05 \times 1000 = 1050 . The higher purchase value covers the cost of the electrical losses in transporting electricity to the Market Customer's connection point from the RRN.

A Market Generator at a connection point with an MLF of 0.95 sells \$1000 of electricity. The MLF of 0.95 multiplies the sales value to $0.95 \times 1000 = 950 . The lower sales value covers the cost of the electrical losses in transporting electricity from the Market Generator's connection point to the RRN.

Therefore, it follows that in the settlements process:

- Higher MLFs tend to advantage, and lower MLFs tend to disadvantage generation connection points.
- Higher MLFs tend to disadvantage, and lower MLFs tend to advantage load connection points.



APPENDIX B. METHODOLOGY, INPUTS AND ASSUMPTIONS

This section outlines the principles underlying the MLF calculation, load and generation data inputs AEMO obtains and uses for the calculation and how AEMO checks the quality of this data. It also explains how networks and interconnectors are modelled in the MLF calculation.

B.1 Marginal Loss Factors calculation Methodology

AEMO uses a Methodology⁸ for calculating MLFs. The Methodology uses the principle of "minimal extrapolation". An overview of the steps in this Methodology is:

- Develop a load flow model of the transmission network that includes committed augmentations for the year that the MLFs will apply.
- Obtain connection point demand forecasts for the year that the MLFs will apply.
- Estimate the dispatch of committed new generating units.
- Adjust the dispatch of new and existing generating units to restore the supply-demand balance in accordance with section 5.5 of the Methodology.
- Calculate the MLFs using the resulting power flows in the transmission network.

B.2 Load data requirements for the Marginal Loss Factors calculation

The annual energy targets used in load forecasting for the 2017-18 MLF calculation are in the table below:

Region	2017–18 forecast sent-out energy ⁹ (GWh)	2016–17 forecast sent-out energy ¹⁰ (GWh)
NSW	68,060	67,755
Victoria	43,747	43,672
Queensland	50,894	54,194
South Australia	12,508	12,922
Tasmania	10,245	10,344

Table 27 Forecast energy for 2017-18

⁸ Forward Looking Transmission Loss Factors (Version 7) - <u>http://www.aemo.com.au/-/media/Files/Electricity/NEM/Security_and_Reliability/Loss_Factors_and_Regional_Boundaries/2017/Forward-Looking-Loss-Factor-Methodologyv70.pdf</u>

⁹ Forecast Operational consumption – as sent out. It was sourced from the 2016 National Energy Forecasting Report (NEFR). The Queensland forecast sent-out energy was revised from 52,405 GWh to 50,894 GWh in the Update to 2016 NEFR Report. See link http://www.aemo.com.au/Electricity/National-Electricity-Market-NEM/Planning-and-forecasting/National-Electricity-Forecasting-Report

Forecast Operational consumption – as sent out. It was sourced from the 2015 NEFR Report. See link
 http://www.aemo.com.au/Electricity/National-Electricity-Market-NEM/Planning-and-forecasting/National-Electricity-Forecasting-Report



B.2.1 Historical data accuracy and due diligence of the forecast data

AEMO regularly verifies the accuracy of historical connection point data. AEMO calculates the losses using this historical data, by adding the summated generation values to the interconnector flow and subtracting the summated load values. These transmission losses are used to verify that no large errors occur in the data.

AEMO also performs due diligence checks of connection point load traces to ensure that:

- The demand forecast is consistent with the most recently published National Electricity Forecasting Report (NEFR).
- Load profiles are reasonable, and that the drivers for load profiles that have changed from the historical data are identifiable.
- The forecast for connection points includes any relevant embedded generation.
- Industrial and auxiliary type loads are not scaled with residential drivers.

B.3 Generation data requirements for the Marginal Loss Factors calculation

AEMO obtains historical generation real power (MW) and reactive power (MVAr) data for each trading interval (half-hour) covering every generation connection point in the NEM from 1 July 2015 to 30 June 2016 from its settlements database.

AEMO also obtains the following data:

- Generation capacity data from the 2016 Electricity Statement Of Opportunity (ESOO).
- Historical generation availability, as well as on-line and off-line status data from AEMO's Market Management System (MMS).
- Future generation availability based on most recent MT PASA data, as of 15 January 2017, as a trigger for initiating discussions with participants with the potential to use an adjusted generation profile for the loss factor calculation.

B.3.1 New generating units

For new generating units, AEMO calculates the initial estimate of the output by identifying similar technology and fuel type in accordance with section 5.4.2 of the Methodology.

For generating units with an incomplete year of generation data from the previous financial year, AEMO uses a combination of existing and estimated data.

Relevant Network Service Providers (NSPs) are advised of the following new generating units in 2017-18. They are:

- Queensland new generating units
 - Cook Shire Solar Storage is included.
- NSW new generating units
 - White Rock Wind Farm, Williamsdale Solar Farm, Mugga Lane Solar Park, Griffith Solar Farm and Parkes Solar Farm are included.
- Victoria new generating units
 - Mt. Gellibrand Wind Farm, Ararat Wind Farm and Kiata Wind Farm are included.
- South Australia new generating units
 - Hornsdale Wind Farm Stage 2 and Waterloo Wind Farm extension are included.
- Tasmania new generating units



- There are no committed generation projects in Tasmania in 2017–18.

B.3.2 Removed generating units

Relevant NSPs are advised of the following removed generating units in 2017-18:

- Swanbank E GT in Queensland.
- SmithField Energy Facility in NSW.
- Hazelwood Power Station in Victoria.
- Northern Power Station and Playford B Power Station in South Australia.

B.3.3 Abnormal generation patterns

AEMO has adjusted a number of generation profiles for the 2017-18 MLF calculation in accordance with section 5.5.6 of the Methodology. This is due to changes in physical circumstances such as:

- Reduction in fuel availability.
- Outages greater than 30 continuous days.
- Reduction in rainfall and water storage levels.

Following the fault on the Basslink interconnector on 20 December 2015, Hydro Tasmania also asked for an update to forecast generation profiles in accordance with section 5.9 of the Methodology based on new developments.

AEMO has used the adjusted generation profiles to replace historical profiles as an input to the 2017– 18 MLF calculation process. AEMO has endeavoured to ensure that the 2017-18 MLF calculation represents expected system conditions, and has made corresponding adjustments to historical Basslink flows in accordance with section 5.3.1 of the Methodology.

The table below shows the historical and adjusted generation values aggregated quarterly and on a regional or sub-regional level.

	Historical Generation (GWh)		Adjusted Generation (GWh)	
	Northern Tasmania	Southern Tasmania	Northern Tasmania	Southern Tasmania
Jul – Sep	1933	1183	2142	967
Oct – Dec	962	783	1070	653
Jan – Mar	1346	951	842	590
Apr – Jun	1969	616	1972	768
Total	6210	3533	6026	2978

Table 28 Adjusted generation values for Tasmania

Table 29 Adjusted generation values for Queensland

	Queensland		
	Historical Generation (GWh)	Adjusted Generation (GWh)	
Jul – Sep	12849	13280	
Oct – Dec	13609	14961	
Jan – Mar	13662	14026	
Apr – Jun	13395	14318	
Total	53516	56586	



Table 30 Adjusted generation values for NSW

	NSW		
	Historical Generation (GWh)	Adjusted Generation (GWh)	
Jul – Sep	15623	15608	
Oct – Dec	14429	14508	
Jan – Mar	15255	16033	
Apr – Jun	14370	14762	
Total	59677	60912	

Table 31 Adjusted generation values for Victoria

	Victoria		
	Historical Generation (GWh)	Adjusted Generation (GWh)	
Jul – Sep	12608	12616	
Oct – Dec	11909	11572	
Jan – Mar	12258	12258	
Apr – Jun	12151	12151	
Total	48927	48597	

B.4 Network representation in the Marginal Loss Factors calculation

An actual network configuration recorded by AEMO's Energy Management System (EMS) is used to prepare the NEM interconnected power system load flow model for the MLF calculation. This recording is referred to as a 'snapshot'.

AEMO reviews the snapshot and modifies it where necessary to accurately represent all normally connected equipment. AEMO also checks switching arrangements for the Victorian Latrobe Valley's 220 kV and 500 kV networks to ensure they reflect normal operating conditions.

AEMO adds relevant network augmentations that will occur in the 2017–18 financial year. The snapshot is thus representative of the 2017–18 normally-operating power system.

B.4.1 Network augmentation for 2017-18

Relevant Transmission Network Service Providers (TNSPs) are advised of the following network augmentations in 2017-18. They are:

Queensland network augmentations

Powerlink provided the following list of planned network augmentations in 2017–18 in Queensland:

- Replacement of Mudgeeraba 275/110kV No.2 transformer.
- Rebuilding of Moura Substation, and reestablishment of the 132kV bus at Moura.
- Rebuilding of Garbutt to Alan Sherriff 132kV lines.
- Rebuilding of Mackay Substation, and reestablishment of the 132kV bus at Mackay.

NSW network augmentations

NSW NSPs provided the following list of planned network augmentations in 2017–18 in NSW:



- Replacement of the three existing 132/66kV 60MVA transformers at Wagga by two 132/66kV 120MVA units.
- Installation of the White Rock 132/33kV substation.
- Removal of Canberra No. 2 330/132kV transformer, after refurbishment of the No. 3 330/132kV transformer.
- Installation of the new Munmorah 132/33kV substation.
- Installation of the new Olympic Park 132/11kV substation.
- Installation of the new Croydon 132/11kV substation.
- Installation of the new Leichhardt 132/11kV substation.
- Installation of the new Rockdale 132/11kV substation.
- Installation of the new Toronto West 132/11kV substation.
- Installation of the New Alexandria 132/33kV STS.
- Rearrangement of Marrickville 132kV feeders.
- Installation of a 132kV feeder between Beaconsfield and Belmore Park.

Victoria network augmentations

AEMO's Victorian Planning Group provided the following list of planned network augmentations in 2017–18 in Victoria.

- Establishment of a new 66 kV supply point with three 220/66kV transformers at Brunswick.
- Establishment of a new 220kV line between Moorabool and Ballarat.
- Establishment of the Deer Park Substation.

South Australia network augmentations

ElectraNet provided the following list of planned network augmentations in 2017–18 in South Australia:

- Replacement of 132/3.3kV transformers for the Morgan-Whyalla pump station.
- Replacement of 132/3.3kV transformers for the Mannum-Adelaide pump station.
- Installation of the second transformer at Dalrymple.
- Installation of two new transformers at Hornsdale Wind Farm 2.
- Installation of a new 50 MVAR 275 kV reactor at Para.

Tasmania network augmentations

TasNetworks provided the following list of planned network augmentations in 2017–18 in Tasmania:

- Upgrading of Sheffield Substation, and increasing the thermal rating of the Sheffield to George Town 220 kV lines.
- Redevelopment of George Town 110 kV, and increasing the thermal rating of George Town to Comalco.
- Increasing thermal rating of Liapootah to Waddamana to Palmerston 220kV, Liapootah to Cluny to Repulse to Chapel Street 220kV, and Liapootah to Chapel Street 220kV.

B.4.2 Treatment of Basslink interconnector

Basslink consists of a controllable network element that transfers power between Tasmania and Victoria.



In accordance with sections 5.3.1 and 5.3.2 of the Methodology, AEMO calculates the Basslink connection point MLFs using historical data, adjusted to reflect any change in forecast generation in Tasmania.

Section 5 outlines the loss model for Basslink.

B.4.3 Treatment of Terranora interconnector

The Terranora interconnector is a regulated interconnector.

The boundary between Queensland and NSW between Terranora and Mudgeeraba is north of Directlink. The Terranora interconnector is in series with Directlink and, in the MLF calculation, AEMO manages the Terranora interconnector limit by varying the Directlink limit when necessary.

Section 5 outlines the loss model for Terranora.

B.4.4 Treatment of the Murraylink interconnector

The Murraylink interconnector is a regulated interconnector.

In accordance with section 5.3 of the Methodology, AEMO treats the Murraylink interconnector as a controllable network element in parallel with the regulated Heywood interconnector.

Section 5 outlines the loss model for Murraylink.

B.4.5 Treatment of Yallourn unit 1

Yallourn Power Station unit 1 can be connected to either the 220 kV or 500 kV network in Victoria.

Energy Australia informed AEMO that the switching pattern for 2017–18 will not differ from the historical switching pattern for Yallourn unit 1.

AEMO modelled Yallourn unit 1 at the two connection points (one at 220 kV and the other one at 500 kV) and calculated loss factors for each connection point. AEMO then calculated a single volumeweighted loss factor for Yallourn unit 1 based on the individual loss factors at 220 kV and at 500 kV, and the output of the unit.

B.5 Interconnector capacity

In accordance with section 5.5.4 of the Methodology, AEMO estimates nominal interconnector limits for summer peak, summer off-peak, winter peak and winter off-peak periods. These values are in the table below. AEMO also sought feedback from the relevant TNSPs about any additional factors that might influence these limits.

From region	To region	Summer peak (MW)	Summer off- peak (MW)	Winter peak (MW)	Winter off-peak (MW)
Queensland	NSW	1030	1030	1030	1030
NSW	Queensland	400	550	400	550
NSW	Victoria	1700 minus Murray Generation	1700 minus Murray Generation	1700 minus Murray Generation	1700 minus Murray Generation
Victoria	NSW	3200 minus Upper & Lower Tumut Generation	3000 minus Upper & Lower Tumut Generation	3200 minus Upper & Lower Tumut Generation	3000 minus Upper & Lower Tumut Generation
Victoria	South Australia*	650	650	650	650
South Australia	Victoria*	650	650	650	650

Table 32 Interconnector capacity



From region	To region	Summer peak (MW)	Summer off- peak (MW)	Winter peak (MW)	Winter off-peak (MW)
Victoria (Murraylink)	South Australia (Murraylink)	220	220	220	220
South Australia (Murraylink)	–Victoria (Murraylink)	188 minus Northwest Bend & Berri loads	198 minus Northwest Bend & Berri loads	215 minus Northwest Bend & Berri loads	215 minus Northwest Bend & Berri Ioads
Queensland (Terranora)	NSW (Terranora)	224	224	224	224
NSW (Terranora)	Queensland (Terranora)	107	107	107	107
Tasmania (Basslink)	Victoria (Basslink)**	594	594	594	594
Victoria (Basslink)	Tasmania (Basslink)**	478	478	478	478

* Victoria to South Australia and South Australia to Victoria limits have changed due to the inclusion of the third transformer at Heywood. ** Limit referring to the receiving end.

The peak interconnector capability does not necessarily correspond to the network capability at the time of maximum regional demand; it refers to average capability during peak periods, which corresponds to 7 AM to 10 PM on weekdays.

B.6 Calculation of Marginal Loss Factors

AEMO uses the TPrice¹¹ software to calculate MLFs using the following method:

- Convert the half-hourly forecast load and historical generation data, generating unit capacity and availability data with interconnector data into a format suitable for input to TPrice.
- Adjust the load flow case to ensure a reasonable voltage profile in each region at times of high demand.
- Convert the load flow case into a format suitable for use in TPrice.
- Feed into TPrice, one trading interval at a time, the half-hourly generation and load data for each connection point, generating unit capacity and availability data, with interconnector data. TPrice allocates load and generation values to the appropriate connection points in the load flow case.
- TPrice iteratively dispatches generation to meet forecast demand and solves each half-hourly load flow case subject to the rules in section 5.5.2 of the Methodology, and calculates the loss factors appropriate to load flow conditions.
- Refer loss factors at each connection point in each region to the Regional Reference Node (RRN).
- Average the loss factors for each trading interval and for each connection point using volume weighting.

Typically, the MLF calculation weights generation loss factors against generation output and load loss factors against load consumption. However, where load and generation are connected at the same connection point and individual metering is not available for the separate components, a single loss factor is calculated for both generation and load.

In accordance with section 5.6.1 of the Methodology, AEMO calculates dual MLF values at connection points where one MLF does not satisfactorily represent active power generation and consumption.

B.6.1 Inter-regional loss lactor equations

The inter-regional loss factor equations applying for the 2017–18 financial year are provided in

¹¹ TPrice is a transmission pricing software package. It is capable of running a large number of consecutive load flow cases quickly. The program outputs loss factors for each trading interval as well as averaged over a financial year using volume weighting.



section 3. AEMO derives these equations by applying linear regression to the set of loss factor data for the RRNs. To meet AEMO's dispatch algorithm requirements, the choice of variables and equation formulation is restricted:

- Only linear terms are permitted in the equation.
- Only the notional link flow between the RRNs for which the loss factor difference is being determined is used.
- Region demands are allowed as equation variables.
- Other variables such as generation outputs are not used.

Graphs of variation in inter-regional loss factors with notional link flow are in section 3.

Inter-regional loss equations obtained by integrating the (inter-regional loss factor -1) function are provided in section 4.

Inter-regional loss equations for Basslink, Terranora and Murraylink are provided in section 5.

The factors used to apportion inter-regional losses to associated regions for 2017–18 are provided in section 6.

B.6.2 Marginal loss factor calculation – quality control

EY was engaged by AEMO to perform parallel calculations of Forward-Looking Transmission Loss Factors ("FLLF") using the Methodology as published by AEMO. EY does not audit or review the MLF outcomes or the internal processes used by AEMO to calculate MLFs. Rather EY's parallel MLF calculations deliver an additional quality control measure to identify instances where there are differences between the results of the two parties.

The parallel calculation of MLFs undertaken by EY uses a two-step process:

- The benchmark study where MLFs are calculated for generators and major industrial loads using primarily publicly available sources of information. There are some inputs that rely on data provided by AEMO. EY has reviewed and provided comment on these data inputs.
- The verification study where MLFs are calculated for all generation and load connection points using the complete AEMO dataset. EY processes this information and calculates MLFs for all generation and load connection points using the PowerWorld software.

The objective of EY's analysis is to assist in identifying potential issues and errors in data processing and MLF calculations by comparing the outcomes of both the benchmark and verification studies with the MLFs calculated by AEMO. EY's benchmark and verification studies have not identified any outcomes from AEMO's final MLFs that would indicate that AEMO has inappropriately applied the intent of the FLLF Methodology. Where differences in MLF outcomes were found between the EY and AEMO MLF calculations, EY has commented on the outputs and applied professional scepticism to AEMO's procedures.

EY has undertaken similar reviews for several years. At the end of each review period, EY provided recommendations to AEMO about the calculation process.

EY's work informing the benchmark and verification studies was completed on 14 March 2017. It does not consider any other events or circumstances arising after the studies' completion date. EY understands that after 14 March 2017, AEMO have responded to market developments by implementing reductions in Queensland regional demand. EY has not been engaged after the 14 March 2017 to perform additional benchmark or verification studies.



GLOSSARY

This document uses many terms with specific meanings defined in the Rules. Those terms have the same meanings when used in this document unless otherwise specified.

Additional terms	and abbrevia	tions are set	out below.

Term	Definition
ACT	Australian Capital Territory
AEMO	Australian Energy Market Operator
AER	Australian Energy Regulator
ESOO	Electricity Statement Of Opportunities
FLLF	Forward-Looking Transmission Loss Factors
Methodology	Forward Looking Loss Factor Methodology
GWh	Gigawatt-hour
km	Kilometre
kV	Kilovolt
LNG	Liquefied natural gas
MLF	Marginal Loss Factor
MNSP	Market Network Service Provider
MT PASA	Medium Term Projected assessment of system adequacy
MVAr	Megavolt-ampere-reactive
MW	Megawatt
NEFR	National Energy Forecasting Report
NEM	National Electricity Market
NEMDE	National Electricity Market Dispatch Engine
NSP	Network Service Provider
NSW	New South Wales
PS	Power station
RRN	Regional Reference Node
Rules	National Electricity Rules
SF	Solar farm
TNI	Transmission Node Identity
TNSP	Transmission Network Service Provider
VTN	Virtual Transmission Node
WF	Wind farm