11 March 2011

Michelle Groves
Chief Executive Officer
Australian Energy Regulator
GPO Box 520
MELBOURNE VIC 3001

AERInquiry@aer.gov.au

Dear Ms Groves

Ergon Energy Distribution Loss Factors for 2011-12

On 25 November 2010, the Australian Energy Regulator (AER) wrote to Ergon Energy Corporation Limited (Ergon Energy) requesting that Ergon Energy calculate Distribution Loss Factors (DLFs) for 2011-12 in accordance with its published methodology and submit them to the AER for approval by 11 March 2011.   The AER also requested that Ergon Energy provide:

- the DLFs in a format fit for editing and publication by AEMO;

- a copy of its published methodology (in electronic form); and

- an independent assurance/certification that the DLFs have been calculated by the application of the relevant published methodology.
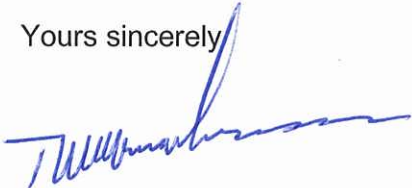
In accordance with this request and clause 3.6.3(i) of the National Electricity Rules (the Rules), please find attached:

- Ergon Energy's DLFs for 2011-12 at Attachment 1. An electronic copy fit for editing and publication by AEMO has been provided to the AER with this submission.

- A copy of Ergon Energy's approved Distribution Loss Factor Calculation Methodology at Attachment 2. This methodology is also published on the Ergon Energy web page and can be found via the following link: http://www.ergon.com.au/contractors,-suppliers-- and--developers/electricity-distribution-pricing-methodologies/distribution-loss-factor- calculation-methodology

- An independent verification by Intelligent Energy Systems (IES) that the DLFs have been calculated in accordance with Ergon Energy's published methodology, at Attachment 3.

In accordance with requirements of the Queensland Electricity Act 1994, Ergon Energy has also calculated DLFs for the Mount Isa region. As Ergon Energy's Mount Isa-Cloncurry network is not part of the National Electricity Market, this is not a requirement of the Rules. However, they are included in this submission for completeness and have been referenced in the IES letter.

Should you have any questions or issues relating to this submission, please contact the Manager Regulatory Affairs – Tariff Strategy, Brad Waters, on (07) 3228 2741.

Yours sincerely

Troy McKay-Lowndes
Acting Group Manager Regulatory Affairs

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Table A3

Network Level	DLF's applied 2010/11			DLF's to apply 2011/12		
	East	West	MI	East	West	MI
Sub-Trans. Bus	1.008	1.006	1.000	1.007	1.019	1.001
Sub-Trans. Line	1.018	1.062	1.006	1.018	1.072	1.007
22/11kV Bus	1.019	1.068	1.009	1.019	1.077	1.010
22/11kV Line	1.034	1.109	1.038	1.038	1.118	1.038
LV Bus	1.068	1.147	1.058	1.070	1.157	1.057
LV Line	1.069	1.251	1.180	1.072	1.302	1.073

Network Level	DLF Codes		
	East	West	MI
Sub-Trans. Bus	GESB	GWSB	GMSB
Sub-Trans. Line	GESL	GWSL	GMSL
22/11kV Bus	GEHB	GWHB	GMHB
22/11kV Line	GEHL	GWHL	GMHL
LV Bus	GELB	GWLB	GMLB
LV Line	GELL	GWLL	GMLL

Table A4 Ergon Energy - Site Specific Distribution Loss Factors

NMI	DLF Code	DLF's applied 2010/11	DLF's to apply 2011/12
QDDD000005	GBSB	1.000	1.000
QAAALV0001	GBSB	1.000	1.000
QAAAMR0000	GBSB	1.000	1.000
QDDD000002	GBSB	1.000	1.000
QDDD000004	GS22	1.008	1.005
QAAABW0000	GBSB	1.000	1.000
QAAABW0002	GS02	1.007	1.000
3051526875	GBSB	1.000	1.000
3051526867	GBSB	1.000	1.000
3051526859	GBSB	1.000	1.000
3051526841	GBSB	1.000	1.000
3051526883	GBSB	1.000	1.000
3051526891	GBSB	1.000	1.000
QDDD003345	GS77	1.022	1.010
QCCC000004	GS19	1.056	1.044
QCCC001004	GS60	1.048	1.044
QCCC000014	GS73	1.005	1.001
QCCC000002	GS18	1.003	1.003
QWAGW00033	GS66	1.009	1.010
QWAGW00066	GS65	1.009	1.010
QAAABW0001	GS51	1.003	1.005
QDDD000003	GS21	1.003	1.002
QAAALV0000	GBSB	1.000	1.000
QGGG000394	GS40	1.178	1.154
QAAABX0014	GS69	1.007	1.007
QEMS000001	GS64	1.014	1.009
QAAALV0002	GBSB	1.000	1.000
QCCC000003	GBSB	1.000	1.000
QAAALV0004	GBSB	1.000	1.000
QAAABX0012	GS70	1.001	1.001
QAAABX0002	GS06	1.013	1.013
QAAARG0000	GS14	1.004	1.004
QCCC700300	GBSB	1.000	1.000
QAAAMR0001	GS13	1.003	1.000
QAAABW0042	GS63	1.037	1.033
QAAABW0041	GS62	1.015	1.015
QAAALX0000	GS12	1.021	1.014
QAAABL0000	GBSB	1.000	1.000
QAAABX0001	GS05	1.008	1.008

Table A5 Ergon Energy Distribution Loss Factors – Embedded Generators

NMI	DLF CODE	DLF's applied 2010/11	DLF's to apply 2011/12
QEEE000547	GS26	0.996	0.997
QEEE000026	GS55	0.979	0.977
QCQPW00076	GS49	0.962	0.956
QFFF000010	GS29	0.979	0.958
QFFF00000Z	GS30	0.979	0.958
QCCC001041	GS67	0.973	0.973
QDDD003206	GS71	0.997	0.999
QDDD003340	GBSB	1.000	1.000
QCCC001036	GS56	0.987	0.987
QMKYW00147	GBSB	1.000	1.000
QGGG000418	GS74	1.001	1.002
3051393689	GS76	0.921	0.950
QEEE000050	GS79	0.983	0.980
3050922955	GS78	0.994	0.978
3050922963	GS78	0.994	0.978

ERGON ENERGY PUBLISHED DISTRIBUTION LOSS FACTOR METHODOLOGY

1. Introduction

Section 3.6.3(g) of the National Electricity Rules (NER) requires that the Distribution Network Service Providers (DNSPs) publish the methodology used by them to determine Distribution Loss Factors (DLFs).

DLFs are calculated annually by DNSPs in accordance with the requirements of the NER in order to determine the amount of energy dispatched to supply customers.

Loss factors are applied by retailers in accordance with the NER.

This report describes the method used to establish DLFs for the following nodes in the Ergon Energy Network:

- All Individually Calculated Customers (ICCs) and selected Connection Asset Customers (CACs) (customers with greater than 10MW of demand or 40GWh pa consumption), Embedded Generators of greater than 10MW and smaller Generators where required by the rules

- All Sub-transmission Bus and Line Customers on an averaged zonal basis

- All 22/11kV Bus and 22/11kV Line Customers on an averaged zonal basis

- All LV Bus and LV Line Customers on an averaged zonal basis.

- A diagrammatic representation of each of the sections is provided in the Network Configuration Diagram.

2. Definition of zones

The zones used for the calculation of DLFs align with the network pricing zonal boundaries as defined in the Network Tariff Guide.

3. Methodology

3.1 Forecast Quantities and Parameters

The NER now requires DLFs to be calculated using quantities and parameters projected to the year in which the DLFs are intended to apply. Customer and generator demands, individual and bulk energy sales, and energy dispatched quantities used are therefore all forecast quantities for the year of application.

All forecast quantities employed in the DLF calculation process are taken from the detailed demand and energy forecasts which Ergon Energy is required to produce for planning, network pricing and statutory purposes. Forecasts produced are intended to reflect the 'most likely' or 'base' case for 'average' weather conditions.

The forecasting methodology follows.

At Connection Point and Bulk Supply Point level, ten-year demand and dispatched energy forecasts are prepared based on regression analysis of up to 15 years of recorded data (typically five-seven years), corrected for switching and other system anomalies. Maximum demands are extrapolated with adjustments to accommodate confirmed and anticipated developments and other known local factors. An independent consultant is also retained annually to produce top-down forecasts using methodology incorporating demographic and econometric techniques. These forecasts are used to provide a check of and validate the internally produced forecasts. Ergon Energy's forecasts are also reviewed by and agreed with Powerlink for mutual planning purposes. Forecasts are also produced for all Zone substations by a similar process to that for Bulk Supply Points.

Energy sales figures are forecast in a similar manner by customer class and, for larger customers, based on their individual projections.

The network model used for load flow analysis is modified to reflect the forecast state of the network in the applicable year by incorporating the configuration changes and asset upgrades contained in the capital works program leading up to that year.

3.2. DLFs for ICCs and Selected CACs (Site-Specific Calculations)

Calculation of DLFs for all ICCs and selected CACs is performed using a Marginal Loss Factor (MLF) approach.

The appropriate part of the sub-transmission network is modelled by including all directly connected 132kV, 66kV, 22kV, and 11kV customers along with direct connected loads representative of the 22kV and 11kV lines (lumped at the 22kV and 11kV busses). The ICCs and selected CACs are modelled to their metering point. The bulk supply point (transmission system connection point) is modelled as an infinite bus.

The modelled loads reflect the forecast demand for the year in which the DLFs are to be applied at the time of the coincident peak of the network being studied, ie the peak of the bulk supply/connection points.

DLF = 1 + total losses/energy delivered.

3.3. DLFs for sub-transmission and substation 11/22kV busbars

Calculation of DLFs for the sub-transmission system nodes and 11/22kV busbars are performed using a similar MLF approach to that described above.

Using the appropriate DLFs as calculated and forecast annual energy consumption data, the energy losses of the Network Sector are derived. The calculated values are validated using projected metering data where possible. Where appropriate data is available, the following process is used:

- Starting with the total network losses (by zone), deduct the losses attributable to the ICCs and selected CACs. This gives the losses to be shared across the remainder of the customers.

- The network sector loss factor for customers (other than ICCs and selected CACs) connected at the sub-transmission level is determined by calculating the sum of the forecast losses in this network sector and dividing by the sum of the forecast sales in the network sector and all downstream sales (other than ICCs and selected CACs).

- This process is repeated for the 11kV and 22kV busses.

The total losses allocated are reconciled with projections based on data extracted from the metering data collection system where available.

DLFs for 22/11kV Lines and SWER Lines

DLFs for 22/11kV and Single Wire Earth Return (SWER) Lines are calculated using a MLF approach derived from sample sets of representative feeders.

Sample sets of distribution feeders, representative of feeders throughout Ergon Energy's area of supply, are modelled on a zone substation basis with the 22kV or 11kV busbar being the infinite bus. Using forecast peak loads for the substation, the demand is allocated across all connected loads on all the lines at the substation. No distribution transformers are included in the model as the loads are applied directly to the high voltage line.

Load flow studies are run for each sample substation feeder system and the DLFs are calculated using the MLF approach described previously.

All distribution feeder systems are then classified according to their similarity to the characteristics of the sample sets and allocated the appropriated DLFs calculated as per above. They are then divided into East and West zones and weighted average loss factors are calculated for line customers based on the forecast energy supplied from each zone substation.

Zonal average values are then calculated and the network sector losses for 11/22kV line customers are determined by calculating the sum of the losses in this Network Sector and dividing by the sum of the sales in the Network Sector and all downstream sales (other than ICCs and selected CACs).

3.5. LV and SWER Customers

The technique described in this section is used to determine the losses in distribution transformers and to determine the appropriate allocation of energy (sales and network sector losses) to LV Bus and LV Line customers in each zone.

A list is obtained of the number, size and voltage rating (11kV/415V or 22kV/415V & SWER) of all distribution transformers in each zone. Typical no load and full load losses in Watts for each different type of transformer have been obtained from test certificates. The maximum demand and projected installed transformer capacity in the zone being examined is used to calculate the peak full load losses of distribution transformers in that zone. The total kWh of losses in distribution transformers for each zone is then calculated by adding the Peak Full Load Losses multiplied by the Load Loss Factor for the zone being examined to the no load losses for that zone.

The break up of the percentage of network sector losses allocated to LV Line and LV Bus customers is estimated by allocating all transformers with two or less customers to LV Bus and the remainder to LV Line. The break up of the percentage of LV energy sales used in the East and West zones is obtained by obtaining and projecting LV usage from Customer Information System (CIS) records. Energy on lines in each zone is then summated to determine the total LV energy sales supplied in each zone.

The network sector loss factor for the LV Bus category is calculated by dividing the projected network sector losses in distribution transformers in the relevant zone by the sum of the projected LV bus sales. This value is then added to the 22/11kV line loss factor to obtain the loss factor for LV bus customers.
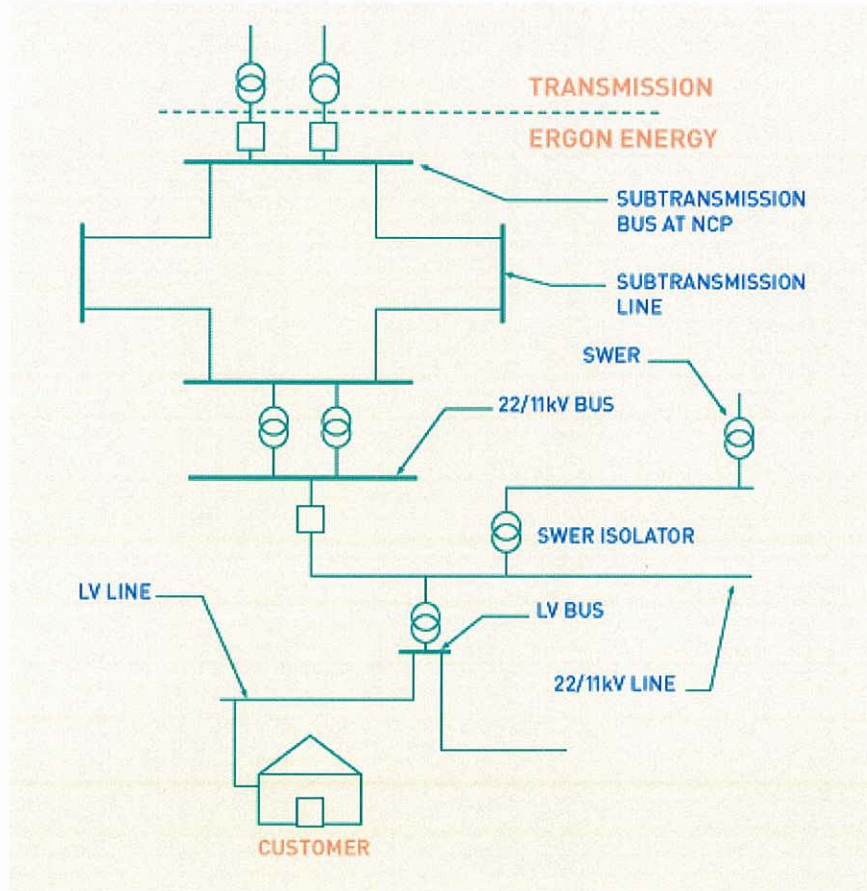
The network sector loss factor for the LV Line category is calculated by dividing the residual losses by the projected LV Line energy sales including streetlights. This value is then added to the 22/11kV line loss factor to obtain the loss factor for LV line customers. The network sector loss for LV Line is the residual loss calculated from projected purchases less projected sales less all other network sector losses.

4. Reconciliation and Reporting

Calculated DLFs are applied and checked to ensure energy balances are valid throughout the supply network. In addition, reconciliation calculation is performed annually for the previous year by applying the published DLFs to actual recorded energy dispatches and sales.

A report detailing the calculations methodology and the detailed results is prepared each year and submitted for approval to the Australian Energy Regulator. Following approval, the DLFs are forwarded to the Australian Electricity Market Operator which publishes them on its website by April of each year.

5. Network Configuration Diagram

INDEPENDENT VERIFICATION BY INTELLIGENT ENERGY SYSTEMS (IES)

28 February 2011

Mrs Carmel Price
General Manager Regulatory Affairs
Ergon Energy Corporation Limited
PO Box 15107
City East QLD 4002

Dear Carmel,

REVIEW OF ERGON ENERGY DISTRIBUTION LOSS FACTORS FOR 2011/12

Intelligent Energy Systems Pty Ltd (IES) has undertaken a review (audit) of the Distribution Loss Factors (DLFs) for 2011/12 financial year calculated by Ergon Energy Corporation Limited (Ergon Energy). The IES audit examined the proposed DLFs with regard to their consistency with Ergon Energy's published methodology which is the published methodology operating in Queensland as at 31 December 2010.

Ergon Energy provided IES with the document "Distribution Loss Factors – 2011", dated 25 February 2011, and supporting spreadsheets for review. Ergon's report described its forecast methodology, DLF calculation methodology for independently calculated customers (ICCs), tariff class customers and embedded generators. The report also included proposed DLFs for ICCs and tariff class customers, sources of data, summary data for losses and sales at the various voltage levels for 2011/12, and reconciliation figures for 2009/10.

The supporting spreadsheets were comprehensive and well set out showing the calculation of series and shunt losses, energy flows, workings of the DLF values, and reconciliation of the total forecast energy sales and purchases for 2011/12 with the calculated DLFs. A spreadsheet showing the historical reconciliation for financial year 2009/10 was also provided. Historical reconciliations were included for Ergon Energy's East and West zones both separately and combined. As Ergon Energy consolidates losses into two price zones – (East and West zones) a reconciliation of losses has appropriately been conducted into the two zones.

Ergon Energy's submission was clear and concise, the calculations consistent with the published methodology and, DLF values correctly determined. The

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proposed DLFs for tariff class customers for the East and West zones are shown in Table 1 and their percentage differences (between 2010/11 and 2011/12) in Table 2. Table 3 details the tariff class DLFs for 2011/12 for the Mt Isa region. The percentage differences between the 2010/11 and 2011/12 DLFs for Mt Isa are detailed in Table 4. DLFs for ICCs are shown in Table 5 along with the existing DLFs and the percentage changes based on the new calculated 2011/12 values. DLFs for Embedded generators are shown in Table 6, this table also indicates the percentage differences between existing and newly calculated DLFs.

The changes in the DLFs proposed for tariff class customers in the East zone compared to the current DLFs vary from between -0.1 % and 0.4% from the 2010/11 values. The changes in the DLFs proposed for tariff class customers in the West zone compared to the current DLFs vary from between 0.8% and 4.1% from the 2010/11 values. The difference in DLFs for the West Zone (particularly the LV line) is due to variations in forecast sales and dispatched energy which have been explained to the satisfaction of IES.

There were no increases in DLF values for Ergon Energy's ICCs which were greater than 1% from last year's DLFs. The majority of DLFs for ICCs either remained the same or decreased in value. These DLFs changes will in the main not have significant impacts on Ergon Energy's ICCs energy costs for 2011/12. Any changes to DLFs for Embedded generators changes have been explained to the satisfaction of IES.

IES has examined the data provided by Ergon Energy (in the form of spreadsheets) and are of the opinion that they have estimated their projections in accordance with the published methodology and DLFs values correctly determined.

When calculating its distribution loss factors, Ergon Energy has used a forward-looking approach which utilises forecast sales and purchase figures produced for Planning, Network Pricing and Statutory purposes. Ergon Energy provides an overview of the forecasting procedure in its report whereby 10 year forecasts are produced using a regression analysis of up to 15 years of historical data. Due to the various cross checks in its own organisation and by an independent consultant, IES believes that the forecasts are robust and are applicable to the calculation of DLFs.
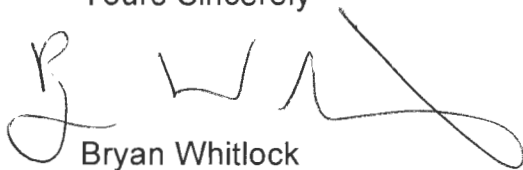
Ergon Energy has carried out a reconciliation of losses for financial year 2009/10 in accordance with the National Electricity Rules' requirements. A separate reconciliation was conducted for each of the East and West zones. It found when applying the 2009/10 DLFs to its actual sales figures for 2009/10, reconciled

(calculated) energy dispatched in both the East and West zones were very closely matched.

Ergon Energy has also calculated DLFs for the Mt Isa region. These DLFs have been calculated in accordance with the same methodology as the DLFs for the East and West zones, similarly these results are valid.

In summary, IES are of the opinion that the DLFs calculated by Ergon Energy for 2011/12 as shown in Tables 1, 3, 5 and 6 are consistent with the published methodology and, DLF values correctly determined.

Yours Sincerely

Bryan Whitlock

Senior Energy Analyst

Table 1	Ergon Energy proposed tariff class DLFs for 2011/12			
Network Level	**2010/11 DLFs**		**Proposed 2011/12 DLFs**	
	East Zone	West Zone	East Zone	West Zone
Sub-Trans Bus	1.008	1.006	1.007	1.019
Sub-Trans Line	1.018	1.062	1.018	1.072
22/11 kV Bus	1.019	1.068	1.019	1.077
22/11 kV Line	1.034	1.109	1.038	1.118
LV Bus	1.068	1.147	1.070	1.157
LV Line	1.069	1.251	1.072	1.302

Table 2	Ergon Energy percent change in proposed DLFs for 2011/12	
Network Level	**East Zone % Change**	**West Zone % Change**
Sub-Transmission Bus	-0.1%	1.3%
Sub-Transmission Line	0.0%	0.9%
22/11 kV Bus	0.0%	0.9%
22/11 kV Line	0.4%	0.8%
LV Bus	0.1%	0.9%
LV Line	0.3%	4.1%

Table 3	Ergon Energy proposed tariff class DLFs for Mt Isa for 2011/12	
Network Level	**2010/11 DLF Mt Isa**	**2011/12 DLF Mt Isa**
Sub-Transmission Bus	1.000	1.001
Sub-Transmission Line	1.006	1.007
22/11 kV Bus	1.009	1.010
22/11 kV Line	1.038	1.038
LV Bus	1.058	1.057
LV Line	1.180	1.073

Table 4	Ergon Energy percent change in proposed Mt Isa DLFs for 2011/12
Network Level	**Mt Isa % Change**
Sub-Transmission Bus	0.0%
Sub-Transmission Line	0.1%
22/11 kV Bus	0.1%
22/11 kV Line	-0.1%
LV Bus	-0.1%
LV Line	-9.1%

Table 5   Ergon proposed DLFs for 2011/12 – Independently Calculated Customers

Region (customer name deleted)	NMI	Existing DLF 2010/11	Proposed DLF 2011/12	% Change
Northern Region				
	QCCC000004	1.056	1.044	-1.14%
	QCCC001004	1.048	1.044	-0.38%
	QCCC000014	1.005	1.001	-0.40%
	QCCC000002	1.003	1.003	0.00%
	QCCC000003	1.000	1.000	0.00%
	QCCC700300	1.000	1.000	0.00%
Capricornia Region				
	QAAALV0001	1.000	1.000	0.00%
	QAAAMR0000	1.000	1.000	0.00%
	QAAABW0000	1.000	1.000	0.00%
	QAAABW0002	1.007	1.000	-0.70%
	3051526875	1.000	1.000	0.00%
	3051526867	1.000	1.000	0.00%
	3051526859	1.000	1.000	0.00%
	3051526841	1.000	1.000	0.00%
	QAAABW0001	1.003	1.005	0.20%
	QAAALV0000	1.000	1.000	0.00%
	QAAABX0014	1.007	1.007	0.00%
	QAAALV0002	1.000	1.000	0.00%
	QAAALV0004	1.000	1.000	0.00%
	QAAABX0012	1.001	1.001	0.00%
	QAAABX0002	1.013	1.013	0.00%
	QAAARG0000	1.004	1.004	0.00%
	QAAAMR0001	1.003	1.000	-0.30%
	QAAABW0042	1.037	1.033	-0.39%
	QAAABW0041	1.015	1.015	0.00%
	QAAALX0000	1.021	1.014	-0.69%
	QAAABL0000	1.000	1.000	0.00%
	QAAABX0001	1.008	1.008	0.00%
Mackay Region				
	QDDD000005	1.000	1.000	0.00%
	QDDD000002	1.000	1.000	0.00%
	QDDD000004	1.008	1.005	-0.30%
	3051526883	1.000	1.000	0.00%
	3051526891	1.000	1.000	0.00%
	QDDD003345	1.022	1.010	-1.17%
	QDDD000003	1.003	1.002	-0.10%
	QEMS000001	1.014	1.009	-0.49%
Wide Bay Region				
	QGGG000394	1.178	1.154	-2.04%
South West Region				

Region (customer name deleted)	NMI	Existing DLF 2010/11	Proposed DLF 2011/12	% Change
	QWAGW00033	1.009	1.010	0.10%
	QWAGW00066	1.009	1.010	0.10%

Table 6   Ergon Energy proposed DLFs for 2011/12 – Embedded Generators

Region (Embedded Generator name deleted)	NMI	DLF 2010/11	DLF 2011/12	% change
Far North Region				
	QEEE000026	0.979	0.977	-0.25
	QEEE000547	0.996	0.997	0.08
	QCCC001036	0.987	0.987	-0.04
	QCCC001041	0.973	0.973	0.00
	QEEE000050	0.983	0.980	-0.33
Capricornia Region				
	QCQPW00076	0.962	0.956	-0.55
South West Region				
	QFFF000010	0.979	0.958	-2.1
	QFFF00000Z	0.979	0.958	-2.1
	3051393689	0.921	0.950	3.14
	3050922955	0.994	0.978	-1.65
	3050922963	0.994	0.978	-1.65
Mackay Region				
	QDDD003206	0.997	0.999	0.14
	QDDD003340	1.000	1.000	0.00
	QMKYW00147	1.000	1.000	0.00
Wide Bay Region				
	QGGG000418	1.001	1.002	0.08