The Lines Company Limited

Pricing Methodology as applied to set the Regulated Lines Charges introduced on 1 April 2013 and as revised at 12 July 2013.

Decision No. NZCC 22

Electricity Distribution Information Disclosure Determination 2012

- Part 4 of the Commerce Act 1986.

Note: the Pricing Methodology as disclosed for 1 April 2013 has not changed. Additional disclosure has been made in order to comply with the above determination, to clarify misinterpretations of the pricing methodology and to correct and/or supplement certain disclosed financial data.

Schedule 17 Certification for Year-beginning Disclosures

Clause 2.9.1 of section 2.9

We, Angus Malcolm DON and Arthur Patrick MULDOON, being directors of The Lines Company Limited certify that, having made all reasonable enquiry, to the best of our knowledge-

a) the following attached information of The Lines Company Limited prepared for the purposes of clause 2.4.1, clause 2.6.1 and subclauses 2.6.3(4) and 2.6.5(3) of the Electricity Distribution Information Disclosure Determination 2012 in all material respects complies with that determination.

b) The prospective financial or non-financial information included in the attached information has been measured on a basis consistent with regulatory requirements or recognised industry standards.

12/7/2013

Date

Angus Malcolm DON
Chairman

12/7/2013

Date

Arthur Patrick MULDOON
Director

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1.0 Introduction

This document provides full public disclosure of The Lines Company's (TLC) pricing methodology as a provider of Electricity Lines Services. This disclosure is a regulatory requirement under the Commerce Commission's Disclosure Determination 2012 and is in recognition of the company's position as a natural monopoly.

The methodology outlines the key cost components used to establish the target revenue to be recovered, the customer groups from whom the target revenue will be recovered, and the allocation methodology used to allocate the key cost components to each customer group and between pricing components.

The readers of this document include those consumers who pay for Lines Services and the regulators.

In industry terms, The Lines Company is a distribution company and functions to provide electricity lines services. TLC is owned by two consumer trusts; King Country Electric Power Trust (10% shareholding) and Waitomo Energy Servicers Customer Trust (90% shareholding). TLC distributes electricity to installations as far south as the ski fields of Ruapehu, east to holiday settlements of southern Lake Taupo, north to the Waikato dairy farms and finally west to the remote coastal regions of Mokau and Awakino. As a distribution network, dominant features are difficult access, low population density, and a significant proportion of seasonal load.

The high proportion of remote rural lines led TLC to introduce higher charges for remote rural customers. These have been in place for over ten years in most of TLC's network.

New metering technology is expected to be rolled out progressively from this year, which will simplify the measurement of kW load and lower the cost to consumers of being able to monitor their load. As a result, effective management of individual load will be possible for a greater number of customers. This demand side response to manage kW load will enable TLC to delay or avoid unnecessary capital expenditure which will be for the long-term benefit of its customers.

2.0 Setting Prices – Assumptions and Statistics: NZCC 22 Section 2.4.3 (1)

The assumptions and statistics used in the determination of prices are presented in Schedule A.

3.0 Pricing Principles Alignment: NZCC 22 Section 2.4.3(2)

Electricity Authority Pricing Principles

(a)(i) "Prices are to signal the economic costs of service provision, by being subsidy free (equal to or greater than incremental costs, and less than or equal to standalone costs), except where subsidies arise from compliance with legislation and/or other regulation."

This is interpreted that TLC charges should reflect the cost of the ICP being serviced. The total charge to a customer should be equal to or greater than the cost of supplying the extra service. This total charge should be less than or equal to the average total cost of service.

By charging in this manner, TLC is able to operate as a financially viable business model. Decisions on operational and capital expenditure are made within standard business models.

The caveat on this is that existing and future subsidies must be applied. The rural subsidy is historical and its continued presence is ensured by statute and customer approval. The level of this subsidy will continue to decrease until the possible effect of price shock is removed. The presence of this subsidy in the TLC network will remain until significant regulatory changes are made that will financially aid Electricity Distribution Business's (EDB) such as TLC with maintenance and renewal of the uneconomic portions of their large rural networks.

The Low User Regulations (Electricity (Low Fixed Charge Tariff Option for Domestic Consumers) Regulations 2004) is the second subsidy that hinders TLC's full recovery of costs. This regulation charges lines businesses and retailers with assisting domestic users in reducing their consumption. The Regulations identify Low Users as ***primary places of residence*** consuming less than 8,000 kWh per annum. As TLC charges on kW load and not consumption, it has been necessary to determine the kW load level of the average consumer.

(a)(ii) "Prices are to signal the economic costs of service provision by having regard, to the extent practicable, to the level of available service capacity."

TLC is the only distribution business to invoice its customers directly. This means that TLC is able to influence customers demand responsiveness through pricing signals. For other lines businesses their charges are bundled by the retailer. TLC pricing methodology of charging on load, capacity and dedicated assets, informs the customer of the distribution costs of providing and maintaining network capacity at a level that meets the load requirements of the customer.

(a)(iii) "Prices are to signal the economic costs of service provision, by signalling, to the extent practicable, the impact of additional usage on future investment costs."

Long term investment in the network is determined by the informed behavior of customers who will adjust their kW load to the pricing signals and thus determine the long term capacity requirements of the regional networks.

Advancement in technology and the advent and successful marketing of powerful heating units such as heat pumps mean that the long term load on network capacity is likely to be increasing. The variable kW load charges combined with capacity charges and dedicated asset charges, as discussed above, signal to the customers the cost of future investment.

(b) Where prices based on 'efficient' incremental costs would under-recover allowed revenues, the shortfall should be made up by setting prices in a manner that has regard to consumers' demand responsiveness, to the extent practicable.

Demand responsiveness and price elasticity are terms used to represent the demand side of an economic pricing equation. Generally there would be sufficient competition in the market to ensure that both sides of the equation; demand and supply are able to act in an efficient manner. For the demand side (consumer) this means they are able to change their demand by substitution. An electricity distribution network is a Natural Monopoly, there is no competition and so the regulators step in to provide protection for a weak demand side. At TLC there is evidence that residential customers are moving to a reduction of peak load. Although not substitution this is demand management in response to pricing signals.

(c)(i)" Provided that prices satisfy (a) above, prices should be responsive to the requirements and circumstances of stakeholders in order to discourage uneconomic bypass."

The main risk of bypass is from large customers who may choose to either, connect directly to Transpower's network and thus bypass distribution, or who find an alternative source of power (such as diesel generation) or even a form of cogeneration. TLC addresses this risk by offering non-standard contract pricing and account management to industrial and large customers. Contract pricing is based on the recovery of dedicated assets, infrastructure and maximum required capacity.

(c)(ii) " Provided that prices satisfy (a) above, prices should be responsive to the requirements and circumstances of stakeholders in order to allow for negotiation to better reflect the economic value of services and enable stakeholders to make price/quality trade-offs or non-standard arrangements for services."

Customers with significant load requirements have individually negotiated contracts that consider price/quality trade-offs such as restriction on loading at certain times or the acceptance of having supply cut during emergencies.

Most other customers are not able to negotiate price/quality trade-offs. Due in part to technology constraints, TLC is unable to offer the majority of its customers a true price /quality

trade-off. Quality of service is a further area of regulatory compliance. TLC is obliged to establish a level of predicted duration of outage and frequency of outage. This is referred to as SAIDI and SAIFI, and breaches of targets subject TLC to regulatory prosecution, including financial penalties.

(c)(iii) "Provided that prices satisfy (a) above, prices should be responsive to the requirements and circumstances of stakeholders in order to (where network economics warrant, and to the extent practicable), encourage investment in transmission and distribution alternatives (e.g. distributed generation or demand response) and technology innovation".

TLC is actively promoting the purchase and use of technology that allows customers to monitor their kW load. Load meters are to be progressively installed over the coming years (as quickly as resources allow). This use of technology, combined with direct billing to customers, enables customers to better understand and manage their load and relative charges.

(d) Development of prices should be transparent, promote price stability and certainty for stakeholders, and changes to prices should have regard to the impact on stakeholders.

TLC is continually working to align itself to this principle. Because TLC invoices its customers directly, it faces great pressure to provide transparency, certainty and stability when setting prices. This principle has a significant role in the development of a forward price strategy, communication policy, and operational processes.

TLC is aware of the financial uncertainties many of its customers face. An annual reset of kW load means that customers have a flat bill for the 12 month period.

The introduction of a Transition Period in the 2012 Pricing Methodology attempts to provide a degree of equity between customers who have chosen to install TOU meters and those still on the legacy standard meters.

(e) Development of prices should have regard to the impact of transaction costs on retailers, consumers and other stakeholders and should be economically equivalent across retailers.

As TLC invoices its customers directly, price development has no impact on retailers. The impact price development has on customers is a major consideration. TLC works hard to keep customers informed as to pricing developments and is frequently involved in public workshops and consultation.

4.0 Customer Consultation: NZCC 22 Section 2.4.1 (4)

TLC has a robust customer consultation process. This is largely because TLC charges the customer directly and on the basis of kW load. Therefore the customer communication has always included the issues of price and the quality of service and has included numerous customer meetings and discussions. (there are performance criteria around completing a set number of these engagements annually. These criteria are included in the AMP). In 2012, TLC specifically communicated and consulted on the possibility of a formal Quality Variation only, Customised Price - Quality Path (CPP) application.

Under the current Default Price-Quality Path (DPP), TLC's price- quality tradeoff is regulated on behalf of the customer. In June 2012 a project team was formed to investigate the possible change to a Quality Variation only, Customised Price- Quality Path (CPP). As part of this investigation TLC has carried out extensive customer consultation:

- Customer survey completed by Versus Research Limited in August 2012 August 2012 An explanation was given and one question asked *"..would you be willing to tolerate an increase in the total pre-arranged time you spend off supply each year in order to delay and minimise future price rises?"* Overall results: 78% of the surveyed customers agreed they would be willing to tolerate an increase;
- Newspaper advertising in October and November 2012;
- Published consultation document delivered to all local libraries and local government offices on 19th November;
- Customer submissions called for in November 2012.

The focus of this process has been to evaluate customer expectation of the price- quality trade off as outlined by TLC. As a result a Customer Consultation meeting was held (chaired by an external chairperson) on the 16th of January 2013. An extract from the Chair's report "..although there was some discussion about scheduling outages at appropriate times – and ensuring effective advance communication about scheduled outages – overall the participants at the meeting clearly favoured the TLC proposal."

TLC has not yet finalised the CPP application.

5.0 Target Revenue: NZCC 22 Section 2.4.3 (3)

The Target Revenue is currently below the revenue permitted under the Electricity Default Price Quality Path, as determined by the Commerce Commission. The shortfall is uneven across consumer groups and pricing components. Target Revenue for the current year is outlined in Schedule B.

6.0 Key Cost Components: NZCC 22 Section 2.4.3 (4)

The key cost components are:

6.1 Transmission

Transmission cost includes:

1. Payments to Transpower for the use of the transmission system.
2. Payments to embedded generators to the extent that the injection from these generators allows TLC to avoid Transmission costs.

6.2 Maintenance

Maintenance cost comprises both direct and indirect network maintenance costs.

6.3 Customer related

Customer related cost comprises:

1. Installation Database costs,
2. Pricing costs
3. Customer liaison costs
4. Industry levies (which are often set on the basis of customer numbers).

6.4 Value related

Value related cost includes all costs that vary according to the value of the network:

1. The cost of capital (return) for the network
2. Network Depreciation.
3. Rates
4. Insurance.

6.5 Collection

Collection cost is the cost of collecting revenue. This is a net figure; the gross collection cost being offset by the value of the prompt payment discounts not taken up by consumers, which TLC would not receive if billing retailers.

The breakdown of total costs due to each cost category is shown in Schedule B.

7.0 Consumer Groups: NZCC 22 Section 2.4.3 (5)

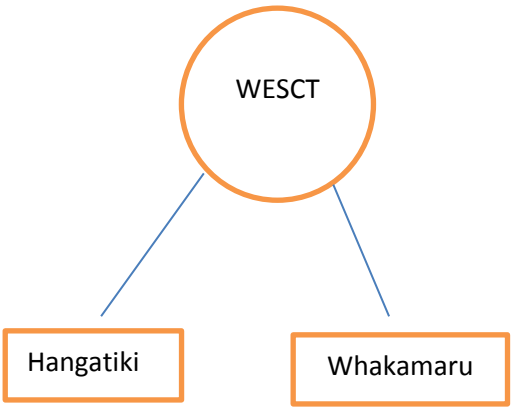
TLC has adopted a matrix approach. Costs are allocated both to consumer groups and to asset groups where the cost of the asset can be separately derived, in order to establish general pricing components. Specific asset components e.g. transformers, dedicated street lighting circuits, and other dedicated assets are therefore costed separately at full cost, and the revenue derived from those asset based charges deducted from the total cost requirement of the particular region.

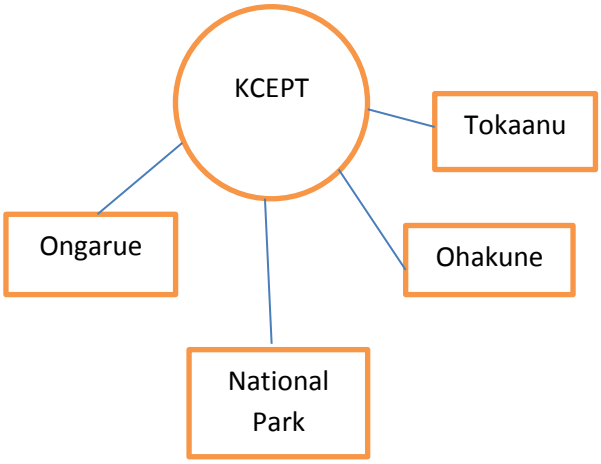
Consumer groups have been identified based on the following cost drivers:

1. There is a considerable difference in regional Transpower charges, due to the difference in the voltage level taken from Transpower and the size of the local peaks.
2. Some regions are load controlled to a greater extent than others. The higher the level of load control, the higher the individual customer load level in the region (i.e. the highest six peaks in a region with many periods of load control is likely to be higher than the highest six peaks in a region with fewer periods of load control). If TLC invests to remove a load constraint, then this will lower load levels (i.e. investment to remove a local load constraint will lower local revenue). To avoid this divergent outcome, TLC would need to recover the investment by increasing regional load charges or increasing regional network charges. Without regional charges this would not be possible.
3. Different regions have signalled a willingness to accept different risk levels in reliability of supply. Ohakune consumers for example have advised that they would prefer the risk of non-supply due to Transpower failure, to having to pay the cost of building a backup supply from a different Transpower supply point. There is a need to allow customers who accept a lower level of service to receive the cost reduction benefit.
4. There is a limit to the extent that one community of interest may be willing to subsidise another community of interest. Fully disclosing regional costs makes the subsidies between areas transparent.
5. Due to distance, there is a higher cost to supply low density rural areas in the level of sunk costs, capital renewal costs, and operating costs
6. In general, customers who own assets dedicated to their supply should have a lower cost than those who are supplied from assets totally owned by TLC, as those customers avoid, or reduce, the cost of network investment.
7. Major industrial customers generally contribute to a large extent to the economic wellbeing of the local communities. They should not be disadvantaged to the extent that an incentive for them to relocate all or part of their operations arises by being obliged to subsidise remote rural lines which they are not taking a supply from.

Consumer groups are as follows:

There are six identifiable Communities of Interest in TLC's network.





Each Community of Interest is split between:

- general customers
- major users.

Where an area could be supplied from more than one Transpower Supply point, the customers in that area are grouped with those with whom they share the most in common. For example the Kuratau area on Lake Taupo is grouped with Tokaanu rather than Ongarue.

Costs, other than asset specific costs, have therefore been assigned to customer groups based on the above geographic regions aligned to the related GXP. Any reference to region or geographic region has the meaning as discussed above.

8.0 Price Changes: NZCC 22 Section 2.4.3 (6)

Charges have increased for two reasons:

- An increase in charges imposed by Transpower. The effect of this has differed between regions dependent upon the region's contribution to Transpower's 100 highest regional peaks in 2012, and the change in regional load levels. The Transpower increase has increased the Transmission variable charge by:

	Hangatiki	**Whakamaru**	**Tokaanu**	**Ohakune**	**National Park**	**Ongarue**
Increase	19.3%	0.0%	12.2%	2.2%	0.9%	15.9%

- An increase in all other charges of 3.5% to cover the increasing costs of providing a sustainable rural network.

9.0 Allocation of Costs amongst Consumer Groups and Asset based Pricing Components: NZCC 22 Section 2.4.3 (7)

9.1 Asset Based Pricing Component Groups

As well as costs being allocated to consumer groups, costs are also allocated to pricing component groups, where pricing components need to be identified in order to isolate the cost of that component from general revenue.

9.2 Transmission

Transmission costs are assigned to consumer groups on the basis of the actual charges paid to Transpower or embedded generators for the relevant geographic region, less any transmission costs charged to any non-standard contract customer in the region. The transmission cost charged to any non-standard contract customer is calculated as follows:

1. Connection costs are charged to non-standard customers in the proportion of their load to the total load in the region
2. Demand costs are charged to non-standard customers based on their actual contribution to the Transmission cost in the region. This is currently calculated by multiplying:
    - the average of the customer's loads at the time of Transpower's top 100 regional peaks, plus an allowance for losses between the installation and Transpower's GXP, by
    - the actual Transpower charge for demand.

9.3 Operating Costs

Planned network maintenance costs are allocated between consumer groups and asset pricing component groups on the basis of historical maintenance averages.

Line maintenance costs are allocated between voltages based on historical averages to give a cost per km of line for each voltage type. Line costs are allocated to consumer groups or individual customers where there is a non -standard contract, based on line length. The current statistics on line length are contained in Schedule A.

9.4 Customer Related

A customer related cost to negotiate contracts and liaise with major customers is calculated and separated into:

- customers with non-standard short term contracts with dedicated assets with a replacement value of greater than $5 million,
- customers with non-standard short-term contracts with dedicated assets with a replacement value of less than $5 million,

- customers with non-standard medium term contracts
- customers with standard major user contracts.

The above major user customer related cost is subtracted from total customer related costs and the remainder is allocated across the regions on the proportional basis of the number of customers in each region relative to the number of total regional customers.

The assumptions on current customer related cost allocation to major customers and the current customer numbers are contained in Schedule A.

9.5 Value Related

Value related costs are allocated to consumer groups and asset based pricing component groups based upon the replacement value of the relevant assets multiplied by the assumed standard age profile of the entire network. This has the effect of smoothing the price across regions irrespective of asset age, thus dampening regional price shock when a large renewal programme is undertaken in any one region.

The allocation approach above also applies to customers on non-standard contracts.

Neither the costs of the low voltage network nor the costs of the low density 11kV network are allocated to Major Users, except to the extent that an individual user is located in a low density zone.

The low voltage assets are not separately grouped.

9.6 Collection

Collection costs are charged to all consumer groups in the direct proportion that the sum of the other costs (being Transmission Costs, Maintenance Costs, Customer Related Costs and Value Related Costs) allocated to each consumer group is to total other costs allocated to each consumer group.

The allocation approach above applies to customers on non-standard contracts and to asset based pricing component groups.

9.7 Price Components

There are two standard contracts that apply to TLC customers. Each of the standard contracts has a variable and fixed charge. The multiplier (kW or KVA) for the variable charge is reset annually. The multiplier for the fixed charge is the higher of that established at connection, or as agreed by TLC and the customer from time to time, or the highest half hour load actually taken in the last 5 years. The two standard contracts are:

1. General
2. Major Users

9.8 Fixed Charges (revised)

Network Charge

The Network charge is based upon the installation's chargeable capacity requirements as measured at the distribution transformer to which it is connected. This is the point at which the customer's demand integrates with the local network.

Chargeable capacity is set at the higher of:

- The capacity level requested in the Connection Agreement for the installation, or subsequently agreed between TLC and the customer's electrician.
- The highest half-hour kW load actually taken over the past five years, where this is metered.
- A notional capacity as set by TLC where neither of the above two are available.

The chargeable capacity of an installation must be greater than the peak kW load of that installation.

To determine the highest half- hour load it is necessary for the installation to have a time- of- use meter (TOU). The TOU meter measures kWh in half-hourly timeslots. For example, if an installation's highest half hour kW load over the past five years was 16kWh we use the following mathematical equations to determine the chargeable capacity. First, we express the highest half-hour kW load by dividing by 0.5 hours.

$$kW = \frac{16kWh}{0.5\ h}$$

$$kW = 32\ kW$$

To determine chargeable capacity we divide kW load by the power factor. Unless already identified for the installation the average power factor for TLC network is 0.95.

$$kVA = \frac{32\ kW}{0.95\ pf}$$

$$kVA = 34\ kVA$$

The chargeable capacity for this installation, based on the highest half-hour load, would be 34 kVA.

To set a notional capacity for an installation, the following guidelines are used -

- For standard installations below 100kva, without TOU meters, the chargeable capacity has proven to be approximately two times the peak kW load.
- Accommodation and larger commercial installations have shown loads closer to their chargeable capacities.

Capacity requirements are banded into groups and assigned a notional capacity. The groups are as follows:

Capacity kVA	Notional kVA
1-3	2
4-6	5
7-9	8
10-11	10
12-15	13
16-20	18
21-30	25
>30	Diversified size

Domestic installations are assessed at a minimum notional capacity of 5 kVA.

Having part of the costs covered by a capacity based fixed charge has two benefits

1. Installations that are not using the network over peak periods still contribute towards the network cost, i.e. recognises the benefit that these installations receive.
2. The variability in total lines charges from one year to another due to changes in load levels is partially dampened. As a result, customers are subjected to most, but not all, of the extra cost due to an increase in demand, and modify demand behaviour if the increased cost is considered undesirable.

Currently the fixed network charge differs in price between general customers resulting from:

a) Different regional density. Density is established by:

- summing the load between the customer's point of connection and the start of the feeder, then
- dividing the above sum by the distance between the point of connection and the start of the feeder.
- Density is either low or high. Low density is less than 50kVA/km.

b) taking supply at different voltages.

If the customer owns the transformer, or is paying a dedicated transformer charge for the transformer that is supplying the installation then the installation will have a high voltage charge.

c) being on the regulated low fixed charge option

The Electricity (Low Fixed Charge Tariff Option for Domestic Consumers) Regulations 2004 oblige TLC to offer a low fixed charge option of no more than 15 cents, exclusive of GST, a day to domestic consumers, other than those in exempt areas. The lower fixed charge is partially offset by a higher variable charge. The loss in revenue due to the requirement to offer the low fixed charge option is recovered by an increase in the kW load charge for standard customers, other than major users

The network charge to Major Users is based upon the higher of:

a) Capacity actually taken, measured by the highest kVA recorded in the calendar year to the prior 31 December, and
b) Contracted capacity. This charge is dependent upon the voltage at which supply is taken.

9.9 Variable Charges

Load

In 2007 kW Load was identified as the optimal method of charging for TLC's distribution service. Previously TLC had used kWh. The pertinent difference is that kW load is a measurement of load demanded from the network whereas kWh is a measurement of electricity consumed over a period of time. Measuring and charging on the basis of kW load is a method of matching the contribution that each installation's peak load makes to the peak load on the local network. The kW load for the installation is set with effect from 1 April each year and remains unchanged for the year. In response to this variable pricing approach the customer may choose to shift their peak load to reduce their contribution to the total local peak load. This action is identified in economic terms as demand-side management. The financial reward to the customer for altering their peak load is a decrease in charges and the financial benefit to TLC is the potential deferment of the cost of incremental network supply, or a lower network renewal cost. TLC has devoted considerable resources to the message that it charges on load. In consequence, peak load growth is reducing and loads are flattening as customers are actively managing their kW load.

For customers other than Major Users, The Lines Company prices on the uncontrolled kW load of an installation during periods of peak local network demand (network constraint). By measuring uncontrolled demand during these periods, TLC is able to plan for both revenue and expenditure. The measurement of consumption (kWh) does not give information about peak/maximum demand and cannot be used to determine the future requirements of the network.

The uncontrolled load at the installation is load that TLC is unable to control by relay. Ripple relays are a load control device that allows control by TLC on part or an installation's entire load. Typically, the hot water cylinder will be on the load control circuit. During periods of network constraint, these relays will be activated by TLC and a portion of potential load will be under the control of the network operator. The consideration of whether the periods of load control be predetermined or reactive and the length of the measurement interval are significant factors in the application of kW load methodology.

Measurement of uncontrolled load at an installation requires an interval meter to be installed. These meters (TOU) measure load at predetermined intervals. TOU meters on the TLC network have half hour intervals selected. For those installations without interval meters, TLC has worked with statisticians to develop conversion profiles that are based on the data provided by sample sets of TOU meters in use on the TLC network. These profiles or formulae allow consumption over a set period to be converted into kW load.

kW load is the multiplier in the variable charge for the Standard and Low user Pricing Plans.

Predetermined or reactive load control periods

TLC is interested in establishing an installation's actual or potential contribution to the network's relevant demand levels at peak times. It is recognised that establishing predetermined peak times for measurement purposes does not necessarily work, as customers proactively manage and thus shift their kW load, and that can cause peaks to be experienced outside the set peak times. TLC operates load control when TLC, or Transpower, are likely to experience a constraint or emergency. If TLC only measures the kW load demand when load control is operating, then the customers are getting an incentive:

- To increase the load controlled by relay. As the controlled load will be switched off by TLC, the controlled load will not contribute to the measured kW load.

- To identify when TLC is load controlling and either automatically or voluntarily switch off kW load during load control periods.

The second option above opens the market to innovation through third parties providing devices that signal when TLC is load controlling

Measurement and Measurement Interval

The aim was to establish a time interval measurement period that could apply equally to industrial and domestic loads.

Industrial kW loads tend to be flat. The same kW load is therefore likely to be imposed on the network system irrespective of the time interval selected.

Domestic loads, however, have sharp peaks with installation peaks occurring over short periods of time, with the kW load then declining quite rapidly. However, not all domestics peak at the same time; in fact, there is a large degree of variation in the timing of peak kW load among domestic installations.

An average domestic contribution to peak demand approximating 2.0 to 2.5 kW was considered reasonable. This conclusion was based on:

- Advice TLC received from Delta on studies it had undertaken
- Measurement of substation demand, where the substation was supplying almost solely domestic load.
- The capacity levels used by engineers in substation and housing subdivision design.

In 2012, after undertaking customer consultation the peak kW load measurement interval was changed to be the average of the six highest two hour peaks (6x2) coincident with local network load control periods.

Subsequent comparisons of demand levels calculated by using figures from the formula used with annual consumptions in kWh for houses with electric water heating has shown that the average house has a demand of 2.2 kW.

Transmission

The current kW load of the installation is used as the multiplier for this pricing component for customers other than Major Users. The transmission component for the Major Users Pricing Plan is split into two parts –

Connection Charge

The connection charge is calculated by dividing the total regional connection transmission charge by the total regional kW load demand. It is charged on the basis of kW load.

Peak Demand Charge

The peak demand charge is charged on the basis of the average of the six two hour highest peaks of the installation, independent of local network peaks or load control periods, measured in kVA, or demand coincidental with Transpower's top 100 peaks. The rationale for charging major users based on anytime peaks is that the customer is large enough to cause local peaks, and as load control is managed at a local level, then these peak periods are likely to be recognised as constrained periods.

Dedicated Asset Fees

Dedicated asset fees are charged for the provision of dedicated assets. These include dedicated transformers, dedicated lines, meters, control equipment, streetlighting circuits and other assets where necessary to meet the requirements of the customer.

Service Fees

There are a number of service fees that are designed to cover the cost of the service provided.
These are:

- Credit Card Surcharge – where lines bills are paid by credit card.
- Administration fees – various account management and supply related services.
- Load shifting charge – where a customer or a retailer requires load control to be undertaken by TLC's plant.
- Billing charge for major users with half hour data.

10.0 Allocation of Revenue between Price Components: NZCC 22 Section 2.4.3 (8)

10.1 Total Revenue

Total Revenue is less than Total Cost in most regions due to two factors:

a) Under pricing

In order to ensure that the pricing structure does not send the wrong economic signals or that large price increases do not result in price shock, TLC has historically adopted a practice of gradually closing the gap between Total Cost and Total Revenue.

TLC has extensively consulted over the kW load pricing component. This component raises a significant proportion of current revenue. The component is designed to ensure that the marginal cost of any new investment in the network, whether it is for new capacity or renewal of existing assets, is fully signalled. The balance of the cost should be raised through the network charge which, when compared to the kW load charge, is relatively stable for most customers year on year, and between like customers.

The enduring question is whether the balance between the fixed network charge and variable kW load is correct. Shifting revenue recovery to the fixed network charge would benefit customers whose kW load during network peak periods is very close to their anytime load. Finding the right balance must be part of any pricing strategy.

b) Intra region cross subsidies

Subsidies exist within Trust regions; the largest being the subsidy between the Tokannu (Turangi) region and the Ongarue (Taumarunui) region. Some of these subsidies will be removed over time with strong growth occurring in the subsidised region that will erode the subsidy e.g. Whakamaru. Others represent the ability of some communities to pay at a greater level than others e.g. the prices in the Turangi region are comparatively low, despite the large subsidy into the Taumarunui region. The company has no intention of altering these levels of subsidy unless:

1. The advice from the respective Trust is that the local communities wished the subsidy rebalanced, or
2. The prices in the subsidised region are such that growth that would lead to uneconomic investment is occurring, or
3. Prices in the region bearing the subsidy are such that economic growth is being restricted.

At this time there is no evidence of any of the above.

The proportion of total revenue that is collected through each price component is disclosed in Schedule C

10.2 Asset based charges

Prices for asset based services are based on cost; reset on a cycle. The next reset to cost is due in 2014.

10.3 Service Fees

Prices for services fees are based on cost; reset on a cycle. New fees were introduced in 2013 based on the expected cost of the individual service. The next reset to cost is due in 2014.

10.4 Major User prices

Prices for major users are based on cost; reset on a cycle. The next reset to cost is due in 2014.

10.5 General prices

General prices are set based on the following:

a) The revenue from transmission charges is intended to cover that year's transmission cost.

b) The revenue from general fixed network charges and variable kW load charges is based on a de-construction approach (i.e. it is obtained by isolating the relevant cost for the items covered by asset based charges and universal charges and subtracting that cost from the general cost). For example, the cost of dedicated transformers has been established. The high voltage general charge is therefore obtained by subtracting the revenue obtained from the dedicated transformer charge from the cost pool used to establish the kW load charge.

c) Network charge

The low density price is set at between 1.9× to 2× the high density price depending upon rounding. The proportion of residual revenue to be recovered by the network charge will be between 60% and 70% of the total network and load revenue across the network, before allowance is made for the decrease in network charge revenue due to the imposition of the low user fixed charge.

d) Load Charge

The kW Load charge recovers the balance of the residual revenue.

11.0 Pricing Strategy: NZCC 22 Section 2.4.4

Due to the shortfall between Total Costs and Total Revenue the company is still developing a strategy on how and when to move to full revenue recovery. Important factors in consideration are:

a) The balance between the proportion of revenue to be recovered from the variable kW load demand charge and the proportion to be recovered from the fixed network charge;
b) The amount of cross subsidy that should exist between regions within Trust areas;
c) The expected regulatory rate of return for the 2015 - 2020 period;
d) Ability to pay is also a consideration.

12.0 Non- Standard Contracts: NZCC 22 Section 2.4.5 (1), (2)

12.1 Customers

The contracts are non-standard because the revenue from each of these customers is primarily driven by the value of the assets solely or substantially dedicated to their supply and the specific customer requirements with regards to supply quality implicit in the assets provided.

The number of ICP's on a non-standard contract is shown in Schedule D.

12.2 Methodology

Where the customer on the non-standard contract is supplied via assets used substantially by customers on standard contracts, then the costs assigned to the customer on the non-standard contract for the use of those assets are as per the methodology for standard contract customers. This includes the following cost components:

1. Transmission fixed costs
2. Maintenance related costs
3. Value related costs
4. Customer related costs
5. Collection costs

In addition there is payable:

6. An asset maintenance cost based on the length of the dedicated asset multiplied by the relevant rate per km from the standard methodology
7. A value related charge being the amount required to be paid each year during the relevant regulatory pricing period to earn the regulatory rate of return on the Regulatory Book Value of the assets during the regulatory return period, and associated costs based on asset value. It is expected that the charge is reset at the beginning of each new regulatory period to align with the regulatory return.
8. Depreciation, being (the Regulatory Book Value of the assets– less the estimated value of the assets at the end of the current contract period) divided by the length of the contract period. The estimated value of the assets at the end of the current contract period is influenced significantly by the likelihood of the operation continuing beyond the contact period, or the assets being of value to another customer.

9. Additional customer related costs depending upon the frequency of interaction required to maintain a contractual relationship.

The non-standard contract methodology aligns with the Pricing Principles in that:

a) It prices on the basis of being subsidy free (equal to or greater than incremental costs, and less than or equal to standalone costs);
b) It has regard to the level of available service capacity;
c) Prices are set with regard to consumers' demand responsiveness;
d) Prices are responsive to the requirements and circumstances of stakeholders in order to discourage uneconomic bypass.

12.3 Supply obligation

There is no specific obligation that would increase the supply obligation in any non-standard contract. However an increased level of service is implicit in:

a) The dedicated assets that are installed, and
b) With some contracts there is an obligation to discuss back-up supply if it is required, and the cost of that supply and which party bears the cost.

13.0 Distributed generation: NZCC 22 Section 2.4.5 (3)

13.1 Methodology and determination of charges:

a) All load taken by a generator is charged at the standard rate for the load
b) All dedicated or enhanced assets supplied to a generator are charged at the standard rate as determined for that asset type.
c) Generation schemes connected to the network prior to 2007 are charged for injection at one third the rate per kVA per annum of the Network charge charged to Major Uses at Hangatiki for the applicable voltage at which they are injecting. The figure has been historically set at a level that provides a benefit to all other customers for the presence of the generation, whilst being small enough not to cause any generation to become unviable.
d) Generation schemes connected after 2007 are charged no injection charge as per the per the requirements of the regulations;
e) All generation is charged an administration charge to cover marginal administration costs.

13.2 Payment to Generators:

All generators receive payment for any benefit they provide in lowering Transpower charges. The calculation of this benefit is dependent upon the structure of the Transpower charge. Currently the benefit is calculated as follows:

- The average injection by the generator at the time of each of the prior year regional half hours used by Transpower to calculate its charge for the previous year;

- Adjusted by losses between the point of injection into the network and the Transpower point of Supply;
- Multiplied by the charge per kW charged by Transpower.

14.0 Glossary

- This is intended to define industry standard terminology where used;
- Identify concepts and terms that are used procedurally within The Lines Company.

Industry standard terminology

Unless otherwise noted the definitions are similar to the definitions presented in the Interpretation section of the Electricity Industry Participation Code 2012.

Chargeable Capacity: capacity that the distributor may charge for but that may not be the actual installed capacity at the relevant ICP.

Consumption pattern: the shape of consumption in an accumulation of half hour periods.

Distributed generation: equipment used, or proposed to be used, for generating electricity that –

a) Is connected, or proposed to be connected, to a distribution network, or to a customer installation that is connected to a distribution network; and
b) Is capable of injecting electricity into that distribution network.

Grid: means the system of transmission lines, substations and other works, including the HVDC link used to connect grid injection points and grid exit points to convey electricity throughout the North Island and South Island of New Zealand.

Grid Exit Point (GXP): any point of connection on the Grid-

a) at which electricity predominantly flows out of the Grid.

Half-hour metering: metering that stores information relating to electricity consumption during half hour periods.

kW: a kilowatt of electrical power.

kWh: a kilowatt hour of electrical energy.

Profile: a fixed or variable electricity consumption pattern assigned to a particular group of meter registers or unmetered loads.

Raw Meter Data: the records and data used to determine meter readings, being information obtained directly from the interrogation of a metering installation.

Target Revenue: means the revenue that the EDB expects to obtain from prices.

Concepts and terms that are used procedurally within The Lines Company

After Diversity: this concept recognizes that individual installations will present diverse loads and that the sum of these diverse loads is the "after diversity contribution to the local peak load."

Community of Interest: A community of people within TLC network(s) that share a common interest with regard to a particular local network.

Controlled load: kW load that is controlled by the network for various reasons. The control is enabled by the installation of a relay at the meter.

Holiday Home: a home other than a Principal Place of Residence.

Installation: a physical site that is capable of being de-energised and which is normally separately metered.

kW load: calculated load that is established annually for each chargeable installation using methodology as discussed in the section on kW load.

Load Meter: refers to the new generation of meters that are able to record consumption and calculate kW load data according to a specific set of rules. These meters are configured so that communication capabilities can be added on, either to an external data collection base and/or in home display systems.

Local Network: the network providing supply to the immediate area surrounding the installation.

Low User: A Principal Place of Residence that has a kW load less than that of the average domestic consumer on The Lines Company network.

Low User Lines Charge: as required by Regulation. Electricity (Low Fixed Charge Tariff Option for Domestic Consumers) Regulations 2004.

Opt Back: The ability of customers with a Time of Use (TOU) meter, but with a load that does not necessitate a CT multiplier to choose either the kW load as calculated by the relevant profile or the kW load as established from the data provided by their TOU meter.

Prompt Payment Discount (PPD): the discount given on the total lines charge if the bill is paid by due date.

Principal Place of Residence: a dwelling house, apartment or other similar place of residence where the person generally sleeps and eats. The following factors can be taken into account in determining whether or not a residence qualifies as a principal place of residence:

- the length of time the person has lived in the residence;
- the address to which a person's mail is sent;
- the place of residence of a person's family;
- whether or not a person's belongings are kept at the residence;
- the person's address on the electoral roll;
- the person's intention in occupying the residence

Standard meter: an electro-mechanical meter only capable of measuring electricity consumption. This is similar to an odometer in a car. No historical data is retained.

Time of Use (TOU) meter: Digital display meter that stores Raw Meter Data for a period of at least 12 months in half-hour intervals.

Transition Period: the interim period between the present and the full rollout of Load Meters.

Transmission: the transmission of electricity from the Grid or connected Generators.

Uncontrolled load: load that is not changed automatically due to the response of a ripple relay to ripple control signal from TLC's plants.

Schedule A: Assumptions and Statistics used to determine Prices (revised)

(a) Line Length

allocation on line length

	33 kV	11 kV	400 V	total length	cost
	km	km	km	km	$000
hangatiki - high	71	471	171	713	831
- low	22	862	-	884	642
ongarue - high	57	254	161	472	627
- low	15	580	80	675	577
national park	-	238	24	262	203
ohakune	-	123	50	173	173
tokaanu - high	75	94	100	269	461
- low	-	105	10	115	89
whakamaru - high	38	36	10	84	152
- low	38	469	28	535	475
contracted	34	119	-	153	178
	350	3,351	634	4,335	4,409

(b) Historical split of line maintenance costs between voltages

33 kv	23%
11kv	51%
lv	26%

(c) Customer Numbers

Standard Customers

	Customers
hangatiki	8,908
ongarue	4,815
national park	812
ohakune	1,907
tokaanu	4,582
whakamaru	2,433
	23,457

(d) Major customers

	Customers
hangatiki	19
ongarue	3
national park	2
ohakune	1
tokaanu	7
whakamaru	1
	33

Allocation of customer related costs for major users:

- Non-standard short term contract > $5 million of assets - $100,000
- Non Standard short term contract < $5 million of assets - $20,000
- Non Standard medium term - $12,000
- Other Major consumers - $5,000

(e) Asset values

	transformer $000	site $000	fuse $000	total $000
15 kva	2,727	2,036	2,036	6,798
30 kva	4,436	2,036	2,545	9,016
50 kva	5,436	2,036	2,545	10,016
75 kva	7,684	2,036	2,545	12,264
100 kva	9,152	2,036	2,545	13,732
200 kva	16,186	5,089	2,545	23,820
300 kva	21,159	5,089	2,545	28,792
500 kva	26,113	5,089	2,545	33,747
750	32,919	5,089	2,545	40,553
1000	38,114	5,089	2,545	45,748
1250	40,712	5,089	2,545	48,346
1500	46,819	5,089	2,545	54,452

(f) Regional values

		replacement $000
contracted		32,641
transformers		77,421
hangatiki	high	48,273
	low	40,942
ongarue	high	33,647
	low	29,256
national park	low	22,849
ohakune	high	8,435
tokaanu	high	23,042
	low	7,526
whakamaru	high	3,100
	low	29,917
		357,049

The assumed regulatory value is $174.2 million

(g) Load

Standard customers		Hangatiki	Whakamaru	Tokaanu	Ohakune	National Park	Ongarue	Totals
High Density	kW	20,294	1,998	11,845	7,051	1,812	9,203	52,203
Low Density		6,821	8,323	290	-	1,818	2,893	20,145

Major Customers		Hangatiki	Whakamaru	Tokaanu	Ohakune	National Park	Ongarue	Totals
Connection	kVA	21,405	999	1,092	2,792	3,020	384	29,692
Interconnection		15,013	999	1,092	578	1,405	384	19,471

(h) Network

		Hangatiki	Whakamaru	Tokaanu	Ohakune	National Park	Ongarue
High Density	kVA	42,216	5,741	27,032	13,200	3,744	21,194
Low Density		15,975	17,720	866	-	5,931	7,824
Major Customers		15,462	1,000	2,602	-	1,300	900

TLC expects to recover 35% of its regional revenue from the network charge in 2013/14 and 65% of its revenue from the load charge. Both charges have been increased by 3.5% from 1 April 2013.

Schedule B: 2014 Target Revenue, Key Cost Components and Allocation to Consumer Groups (revised)

Summary

	transmission $000	mtce $000	customer $000	value related $000	collection $000	total $000	revenue $000	diff $000
Non-Standard	626	332	146	2,267	14	3,384	4,345	961
Generator	-	125	-	347	-	472	472	-
Transformer Charges	-	90	-	1,979	9	2,078	2,659	580
Hangatiki	3,078	1,318	514	7,502	55	12,467	11,544	(923)
Ongarue	1,200	1,033	257	5,290	34	7,814	4,836	(2,978)
National Park	431	207	50	1,921	11	2,620	1,859	(761)
Ohakune	430	176	99	709	6	1,421	2,047	626
Tokaanu	701	553	260	2,571	17	4,103	4,273	170
Whakamaru	165	631	127	2,777	16	3,715	3,845	129
Total	6,630	4,466	1,453	25,363	161	38,074	35,879	(2,195)

By Region

	Cost	Revenue	Difference
Hangatiki	15,688	15,613	(75)
Ongarue	8,647	5,556	(3,091)
National Park	3,113	2,651	(462)
Ohakune	2,430	2,716	286
Tokaanu	4,206	4,483	277
Whakamaru	3,991	4,860	869
	38,074	35,879	(2,195)

By Trust Region

	Cost	Revenue	Difference
Waitomo	19,679	20,473	4%
King Country	18,395	15,406	-16%
	38,074	35,879	

Cost allocated to each Consumer Group in the above tables is based on historical estimates of the Regulatory Asset Base (RAB) and as such are subject to significant variation upon completion of the RAB values at 31 March 2013 under the revised input methodologies.

The current Target Revenue is below Total Cost.

Schedule C: Proportion of Total Revenue to be raised through each pricing component (revised)

Hangatiki	Transmission	Network		Dedicated Assets		Totals
		Load	Network	Transformers	Other	
	$000	$000	$000	$000	$000	$000
High density	1,602	3,918	1,191	581	148	7,440
Low Density	539	1,253	843	648	-	3,283
Major customers	659	-	1,391	46	-	2,096
Non-standard	757	-	1,774	27	-	2,557
Generation	-	-	-	-	236	236
Totals	3,557	5,171	5,199	1,302	384	15,612

Whakamaru	Transmission	Network		Dedicated Assets		Totals
		Load	Network	Transformers	Other	
	$000	$000	$000	$000	$000	$000
High density	36	521	164	38	21	780
Low Density	148	2,050	708	536	-	3,442
Major customers	19	-	178	6	-	202
Non-standard	-	-	-	-	436	436
Totals	203	2,571	1,050	580	457	4,860

Tokaanu	Transmission	Network		Dedicated Assets		Totals
		Load	Network	Transformers	Other	
	$000	$000	$000	$000	$000	$000
High density	722	2,185	906	68	44	3,925
Low Density	18	51	42	41	-	152
Major customers	37	-	268	12	-	316
Non-standard	21	-	59	10	-	90
Totals	798	2,236	1,275	130	44	4,483

Ohakune	Transmission	Network		Dedicated Assets		Totals
		Load	Network	Transformers	Other	
	$000	$000	$000	$000	$000	$000
High density	490	1,093	464	85	-	2,132
Low Density	-	-	-	-	-	0
Major customers	-	-	-	-	-	0
Non-standard	92		492	-	-	584
Totals	582	1,093	956	85	-	2,716

National Park	Transmission	Network		Dedicated Assets		Totals
		Load	Network	Transformers	Other	
	$000	$000	$000	$000	$000	$000
High density	184	356	150	35	-	725
Low Density	184	349	383	71	-	987
Major customers	75	-	178	8	-	261
Non-standard	175	-	502	-	-	678
Totals	618	705	1,213	114	-	2,651

Ongarue	Transmission	Network		Dedicated Assets		Totals
		Load	Network	Transformers	Other	
	$000	$000	$000	$000	$000	$000
High density	803	1,889	634	192	136	3,654
Low Density	252	571	419	289	-	1,531
Major customers	38	-	94	3	-	135
Non-standard	-	-	-	-	-	0
Generation	-	-	-	-	236	236
Totals	1,093	2,460	1,147	484	372	5,556

Schedule D: Non-Standard Contracts (revised)

The ICPs covered by non-standard contracts, and the value of target revenue to be recovered from these is set out below:

Area of Non-Standard Contracts	Number of ICPs	Target Revenue $000
Hangatiki	2	2,557
Whakamaru	1	436
Tokaanu	1	90
Ohakune	1	584
National Park	2	678

Schedule E: Load Measurement (revised)

Time of Use (TOU) meters provide half hour consumption data. For kW load to be determined the uncontrolled meter readings need to be validated and matched to the relevant periods of local network load control.

During 2010 and 2011, TLC employed Sapere Group to review TLC's pricing methodology, specifically the methodology of kW load. On their recommendation, and following public consultation, TLC determined in 2012 to adopt a new method of kW load measurement. The kW load of an installation is established by identifying the average of the six highest two hour peaks (6x2) coincidental to local network load control periods.

Customers with a supply capacity of 100kVA or greater have a singular influence on the local network. It is not necessary to identify coincidental periods of load control. The data is either demand coincidental with 100 highest Transpower peaks or the average of the six highest two hour peaks at the installation, independent of network constraint.

Load Calculation (revised)

kW load from a TOU meter

Processes have been established that are intended to provide transparency and consistency to the TOU data collection and load measurement process. These are summarised into 6 stages, the last three are run through customised software.

1. Collect raw data. As meter types change the method of collection changes. Presently the data is read manually using either a hand held device or laptop reader.
2. Validate data. This may include daylight saving adjustments.
3. Collate local load control periods from network data. The load control channels for evaluating kW load are domestic hot water channels. As this data is from the SCADA system (used to control the network) it is seen as the true data.
4. Match interval readings to control periods.
5. Identify the highest six two hour periods of coincidental demand.
6. Average the 6 values to provide a kW load value.

Adjustments to TOU kW load

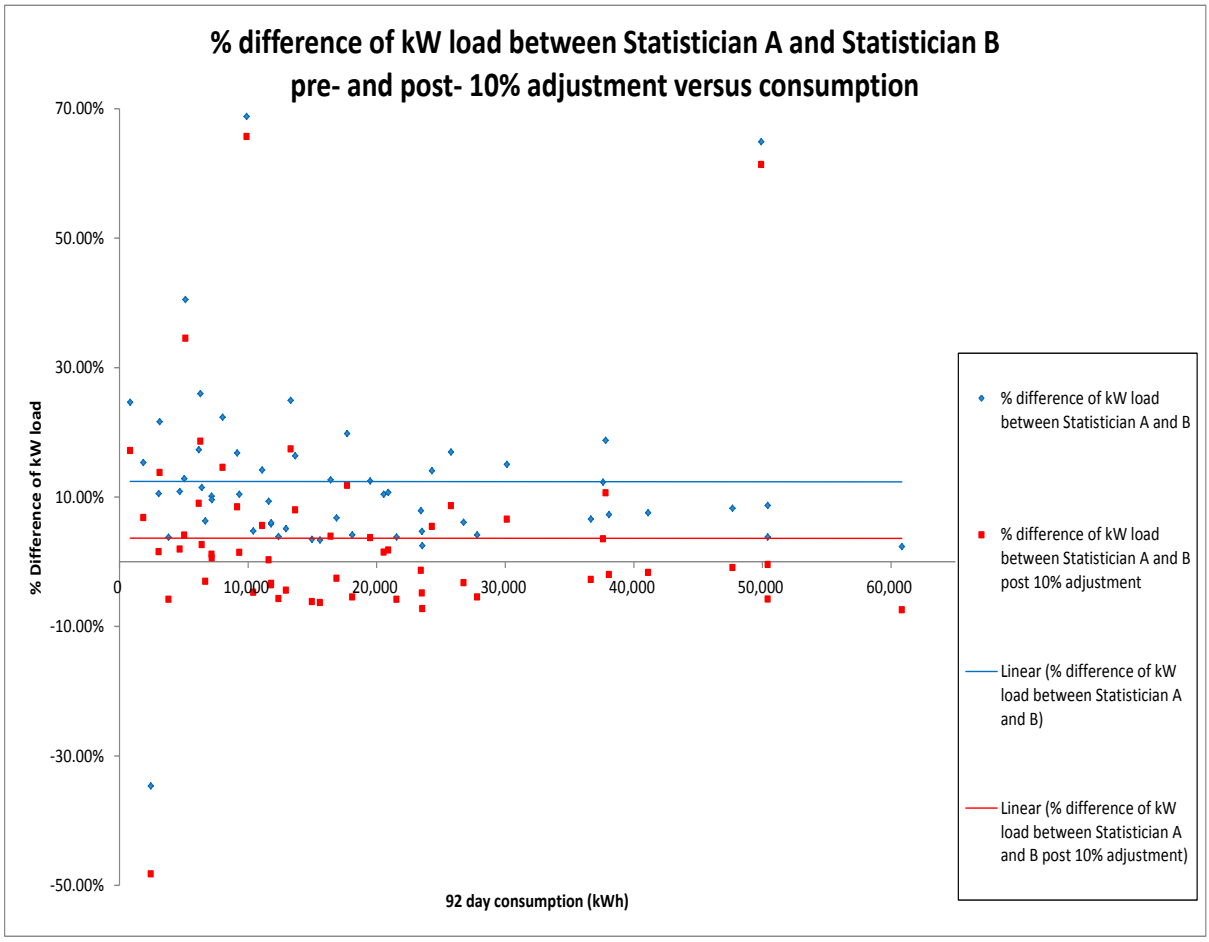
There are two main adjustments to the raw data from TOU meter readings to correct it to the load measure. First, where data includes both controlled and uncontrolled load, it needs to be "clipped" to ensure that half hours are not contaminated by data that is not subject to control (i.e. the ripple control has operated part way through the half hour). This clipping is likely to result in the kW load from TOU customers being lower than that used for profile setting. The second adjustment has been made to correct for the effect of the first adjustment, so that the load level aligns with that of an identical customer that has uncontrolled load separately metered. The meters used to establish

the Standard and Dairy profiles meter uncontrolled load only and therefore do not require clipping. If a correction is not made to the clipped data, then the loads from the TOU meters would consistently be lower than those established under the profile formulae.

Meters currently being trialed isolate the specific data from load control periods and calculate the load from the specific relevant data. This will avoid the necessity to either clip data or make an adjustment for the effect caused by clipping.

To ensure there is no adverse outcome for customers, we have introduced the "Opt-Back" (refer to section titled Opt-Back). Therefore, no customer is adversely affected by the adjustments.

This adjustment is based on the difference on the slope of the graphs that each method produces, based on individual customer data points and using regression analysis producing a flat line of difference of 10.6%. We have applied a flat rate increase of 10% to the calculation based on this.



kW load from a Standard meter

A Standard meter is capable only of providing consumption data as at time of interrogation (meter reading). In order to establish the kW load of an installation with a standard meter or meters, a conversion formula must be developed. This equation or conversion rate allows consumption or kWh to be converted into kW load. The procedure followed is enabled by various software programs but is essentially the following process:

1. A test set of TOU meters is identified. These meters will represent a specific usage pattern or profile. Currently there are three profiles available for customer with a standard meter.

   Standard Profile

   This is essentially a default profile and best represents the usage pattern of domestic residences. It is based on the assumption that as kWh consumption increases load levels do not increase proportionally.

   Dairy Profile

   The Dairy profile exists as dairy milking sheds do not peak over winter, and instead contribute to local network peaks during August to December.

   Temporary Accommodation

   This profile includes holiday homes, where at the lower end consumption does not correlate to load and those installations where the load level is more likely to increase in proportion to consumption as the increase in consumption, at least in part, simply reflects a greater number of accommodation rooms or guests. Holiday homes, accommodation businesses, ski lodges, and other similar establishments have their kW load defined by this profile.

   As holiday homes are used intermittently, demands cannot be adequately calculated from consumption data. The networks supplying the areas where these are sited, however, generally are built to supply the seasonal holiday local peak. The minimum load level for a Holiday Home may be increased above that produced by the Temporary Accommodation profile formula where higher fuse sizes, the presence of uncontrolled water heating or sub-maining, lead to an inference of a higher demand level.

   The minimum level for holiday homes is based on the average load of TOU meters in holiday homes in the local community using less consumption than the average house. If a holiday home is only occupied out-of-season, or has a very small or well managed load, then it would be beneficial for the customer to have a TOU meter fitted.

2. The data provided by these three sets of test meters is used to correlate the peak demand (6x2) with consumption over the same period. A mathematical equation that expresses this correlation is provided for each profile. This equation allows consumption

as the variable x to be converted to kW load (y). The line as shown on the graph is a best –fit line.

3. The equation of each profile is then applied to the consumption data of relevant installations with a standard consumption meter. Thus providing kW load for each installation.

Consumption Data and 92 Day period

Consumption data for use in the profiles comes from the meter reads as provided by the customers' electricity retailer. Apart from the exception below, the 92 day uncontrolled consumption is calculated from the difference between readings over an identified number of days, divided by the number of days and then multiplied by 92.

The exception is customers who do not have their uncontrolled consumption separately metered, or where the "controlled consumption" is limited in some way. In order to determine the uncontrolled portion of total consumption a percentage is applied to the consumption data. The percentage applied is dependent on register type and profile. The relevant percentages applied for the Standard Profile, Dairy Profile and Temporary Accommodation Profile are detailed later in this document.

Uncontrolled Consumption is established for a 92 day period that corresponds to the relevant periods of constraint on the network and the customer profile. This 92 day uncontrolled consumption (kWh) is the X variable in the equation that has been developed using sample TOU data and trend line analysis. 92 days is generally held to correspond with the 3 month winter period, traditionally a period of peak demand. The dates for the relevant 92 day periods are identified below in the section titled Profiles and Conversion Equations.

An installation cannot have a zero load unless:

- If on profile, the installation has had no consumption over the entire relevant 92 day period of the prior year.
- If metered with a load meter, the installation has had no consumption over all local load periods of two hours or longer in the previous year.

Load Control Periods

The number of co-incidental load control periods used to determine kW load during the development of the profile formula is a critical part of the assessment. The number of periods has an S-Curve graph, i.e. a minimum number of periods beyond which the result of the low number of load control periods will produce the same load level result due to the natural load that a customer will use. For example, a house with a refrigerator and other similar appliances that operate continuously will have a natural load.

There are a maximum number of load control periods above which the load level will be materially the same. This is because there is a natural load that a premise has.

The assessment based on historical data is that the lowest number of load control periods that give the right load settings is approximately 90.

2013 Profiles and Conversion Equations (revised)

Standard Profile

Actual meter readings between 1 June and 30 September are used.(Winter) Where there is only one meter reading available during that period the readings from May through October may be used. If no meter readings within this period are available then, on some very rare occasions, meter readings outside of these months are used, or the load will remain unchanged.

The uncontrolled percentage of consumption for standard type meters on the Standard Profile has been determined as follows:

Register content	Percentage	Description
UN	100%	Uncontrolled
MI	76%	Mixed North
MI	65%	Mixed South
LOP	55%	Limited Off Peak
OP	0%	Off Peak
NI	0%	Night

- Mixed North - controlled/uncontrolled – Hangatiki and Whakamaru, 76% of the consumption (based on the assumption that as the majority of customers have their uncontrolled usage separately metered, those customers still on the mixed rate are likely to have a higher than average proportion of uncontrolled consumption).
- Mixed South- controlled/uncontrolled – Ongarue, Tokaanu, National Park and Ohakune, 65% of consumption (a significantly lower ratio of customers have their uncontrolled usage separately metered. This provides a small incentive for the average customer to request separate metering).
- Limited Off peak – 55% of consumption.

The Standard Profile formula is of two parts reflecting the following:

1. Where the consumption is less than 790 kWh the application of a power formula reflects the extremely low loads of this group.
2. Above 790kWh a linear calculation is used.

These equations were derived from a sample of uncontrolled TOU meters in the Standard Profile Category on The Lines Company network using:

- 6 x 2 hour maximum peaks (kW) averaged from 20/09/2011 to 19/09/2012 (where data available); and
- Energy consumption (kWh) from 20/06/2012 to 19/09/2012.

For energy consumption (92 day) < *790 kWh*:

$$kW\ Load = \left(\frac{0.07302 \times 92\ day\ energy\ consumption^{0.5793}}{2} \times 1.0177\right) kW$$

For energy consumption (92 day) ≥ *790 kWh*:

$$kW\ Load = \left(\frac{0.001715 \times 92\ day\ energy\ consumption + 2.128}{2} \times 1.0177\right) kW$$

Dairy Profile

This profile is for Dairy Milking Sheds only.

Actual meter readings between 1 September and 30 December are used. Where there is only one meter reading available during that period the readings from August through January may be used. If no meter readings within this period are available then, on some very rare occasions, meter readings outside of these months are used, or the load will remain unchanged.

For Dairy Milking Sheds in the Southern regions; Ongarue, National Park, Ohakune and Tokaanu the uncontrolled percentage of consumption for standard type meters on the Dairy Profile has been determined as follows:

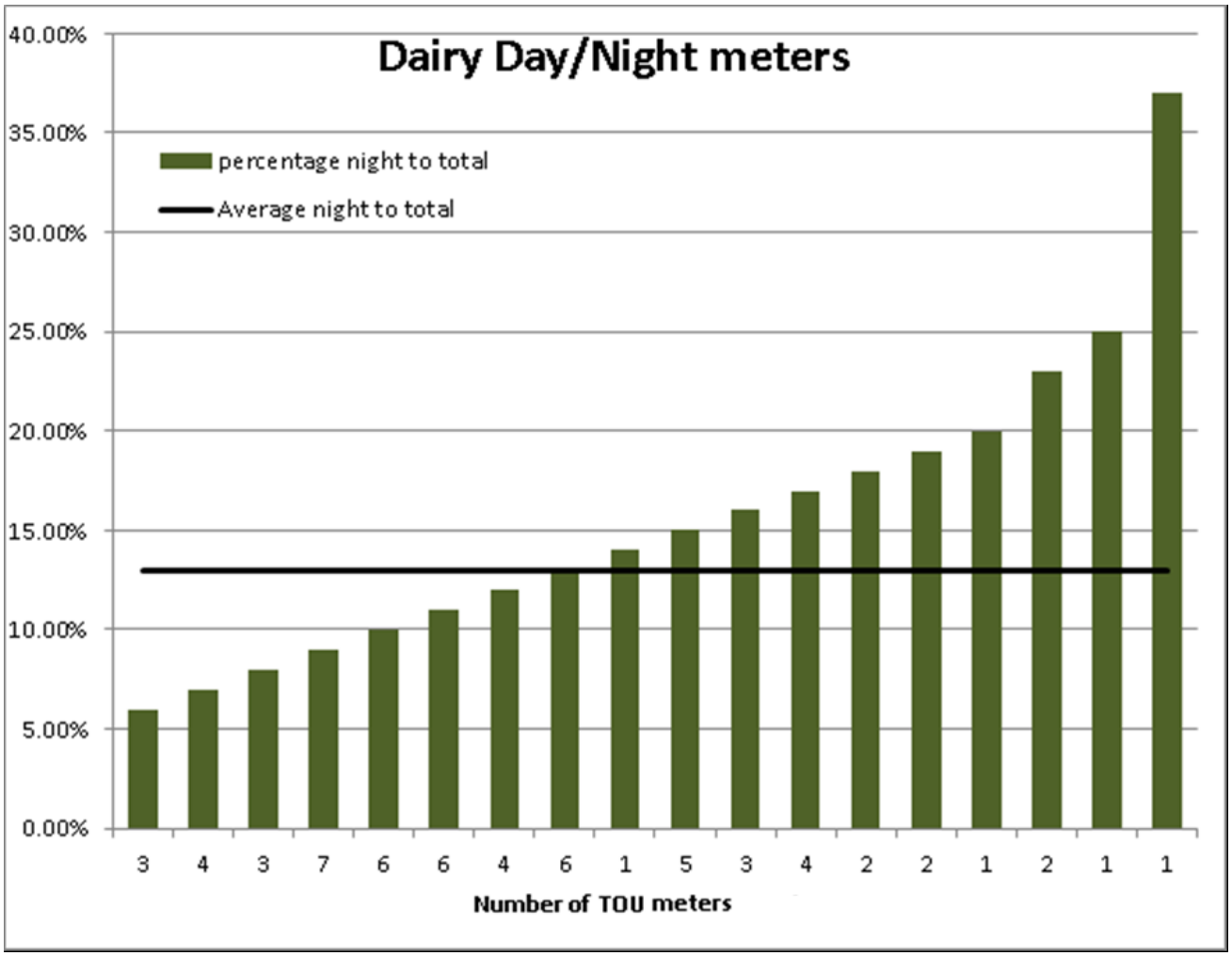
Register content	Percentage	Description
UN	100%	Uncontrolled
MI	65%	Mixed South
LOP	55%	Limited Off Peak
OP	0%	Off Peak
NI	0%	Night

For Dairy Milking Sheds in the Northern regions; Whakamaru and Hangatiki, the uncontrolled percentage of consumption for standard type meters on the Dairy Profile has been determined as follows:

Single Rate Meters		
Register content	Percentage	Description
UN	100%	Uncontrolled
MI	76%	Mixed North
LOP	55%	Limited Off Peak
OP	0%	Off Peak
NI	0%	Night

Two-Rate Meters		
Register Content	Percentage	Description
UN/UN	100%	Both rates Uncontrolled
MI/MI	76%	Both rates Mixed
LOP/LOP	55%	Both rates Limited Off-Peak
UN/NI	87%	Uncontrolled/Night
MI/NI	66.12%	Mixed/Night
OP/NI	0%	Off-Peak/Night

The percentages used in the second half of the table above are the result of an analysis carried out to determine the average night to total consumption ratio. The following graph shows the results:



Using TOU meters which do not rely on the relay signal, it was found that the average night to total consumption ratio in the 2012 period was 13%. Applying this ratio the uncontrolled percentage has been determined to be as follows:

- Uncontrolled and Night (87%) – being 87% of uncontrolled consumption (100%)

- Mixed and Night (66.12%) – being 87% of uncontrolled consumption (76%)

The Dairy Profile formula is as follows:

This equation was derived from a sample of uncontrolled TOU meters in the Dairy Profile category on The Lines Company network using:

- 6 x 2 hour maximum peaks (kW) averaged from 01/09/2012 to 31/12/2012; and
- Energy consumption (excluding night) (kWh) from 01/09/2012 to 31/12/2012.

For energy consumption (92 day) < *700 kWh*:

$$kW\ Load = (Standard\ Profile)kW$$

For energy consumption (92 day) ≥ *700 kWh*:

$$kW\ Load = \big((0.001267 \times 92\ day\ energy\ consumption - 0.848) \times 1.0457\big)kW$$

Temporary Accommodation Profile

Actual meter readings between 1 June and 30 September are used.(Winter) Where there is only one meter reading available during that period the readings from May through October may be used. If no meter readings within this period are available then, on some very rare occasions, meter readings outside of these months, but encompassing these months may be used, or the load will remain unchanged.

This equation is derived from a sample of uncontrolled TOU meters in the Temporary Accommodation Profile category on The Lines Company network using

- 6 x 2 maximum peaks (kW) from 01/10/2011 to 30/09/2012; and
- Energy consumption (kWh) from 20/06/2012 to 19/09/2012.

The uncontrolled percentage of consumption for standard type meters on the Temporary Accommodation Profile has been determined as follows:

Register content	Percentage	Description
UN	100%	Uncontrolled
MI	76%	Mixed North
MI	65%	Mixed South
LOP	55%	Limited Off Peak
OP	0%	Off Peak
NI	0%	Night

The Temporary Accommodation formula is of three parts reflecting the following:

1. Where the profile formula calculation under the Standard profile calculation would result in a minimum as described below, this is used. This part of the formula is used up to 1,166 kWh. For Holiday Homes a minimum of 2.1 kW applies in areas other than Ohakune where a minimum of 2.9 kW applies

2. Between 1,166 kWh and 2,683 kWh a linear calculation is used

3. Above 2,683 kWh, the calculation reflects the capacity, i.e. if capacity was to double so would the load, which is what is observed in the data analysis

$$kW\ Load\ (for\ energy\ consumption < 1{,}166kWh) = 2.1kW$$

<u>For energy consumption (92 day) ≥ *1,166 kWh and < 2,683 kWh*</u>:

$$kW\ Load = \frac{59}{15{,}170} \times 92\ day\ energy\ consumption - \frac{36{,}937}{15{,}170} kW$$

<u>For energy consumption (92 day) ≥ 2,683 *kWh*</u>:

$$kW\ Load = \left(\frac{0.0586 \times 92\ day\ energy\ consumption^{0.7053}}{2} \times 1.0424\right) kW$$

Low Fixed Charge Calculation under Load Charging

The "Average Domestic Consumer" should be no worse off on the low fixed charge option than on the normal pricing option. The regulations describe the average domestic consumer as one who uses 8000 kWh a year, and provides a mechanism under clause 15 (2) (b) whereby the average consumer in the TLC supply area consumes on a different ratio than that specified in the regulations.

Using clause 15 (2) (b) then:

The kW load of the Average domestic consumer is established using the meter readings of domestic consumers with an annual consumption between 7,000-9,000 kWh. The uncontrolled winter/annual consumption ratio is established. This ratio is applied to 4,800 kWh. (4,800 kWh being the industry standard for uncontrolled consumption on a 60/40 annual consumption of 8,000 kWh).

This work provides an uncontrolled 92 day consumption figure which is interpreted as being representative of the average domestic consumer. This 92 day consumption is then used in the standard profile of that year and the result is the kW load of the average domestic consumer on The Lines Company network for that year.

Regulated Distributor Tariff Option

The Fixed Charge cannot be greater than 15 cents per day, excluding GST.

The variable charge plus the fixed charge must be such that the customer on the low user option would pay no more than the average domestic consumer on any alternative tariff. At TLC this is identified as the Breakeven. An analysis proving this is sent through to the Electricity Authority.

Exemption Certificate

Some areas of the TLC supply area are exempt from the Low User regulations. These areas are disclosed on the TLC website under the pricing section.

Opt-Back

Customers with a standard meter are less able to manage their demand and in turn receive real economic benefit as a result of kW load reduction. TLC is in the process of providing TOU meters to all of its customers. However there are still significant numbers of customers whose kW load is set by a trend line equation. Unfortunately it has become clear that there is a position of inequity occurring between customers on different meter types. As part of the transition to load meters over the next few years we will enable customers to have TOU meters installed yet be billed on the lower of the load from the TOU meter or as calculated by the relevant profile. Not all customers will have a relevant profile to opt back to. During this period, TLC will continue to install TOU meters as requested and will continue to use the data gathered from these meters to improve the management of kW load methodology.

This Opt-Back will be available for a minimum of two years. Customers will have the option of either moving back to the formula or keeping with their TOU load.

This will give time for customers to engage in load reducing strategies should they so desire and TLC will be helping customers with these strategies should they require assistance. For customers with no profile to opt back to, TLC will work to provide load management and reduction strategies.

As part of the annual load reset, TLC has written to each customer who has a TOU meter setting out their individual options and advising them that TLC has set their load at the lower of the two. Clearly if the customer wishes to take the higher load option they can advise TLC.

TOU – Establishment of 92 day consumption for opt back

The 92 day uncontrolled consumption is calculated directly from an installation's TOU data.

If an installation has a domestic hot water relay, the uncontrolled portion of the load for standard and temporary accommodation installations has been assessed as follows:

- Hangatiki and Whakamaru: 76% of energy consumption;
- Ongarue, Tokaanu, National Park and Ohakune: 65% of energy consumption.

Opt-Back Adjustment

This Opt-back has had an impact on the calculation of the profile formula. Each profile formula has been developed with reference to this impact and adjusted to reflect the fact that customers with a TOU meter and a load below the profile will have opted out of the profile. Taking out these customers moves the average of those remaining on the profile upwards so that it accurately reflects the population being profiled. That is the reduction in the load levels arising from the opt back has been accounted for by a percentage increase in the relevant formula as follows:

Standard Formula	1.77%
Dairy Formula	4.57%
Temporary Accommodation Formula	4.24%

As TLC moves forward, until Load Meters are universally installed in any area and Profiles abandoned, then TLC can expect those customers with metered loads less than the relevant Profile to opt out of the profile and the Profiles to be adjusted to reflect the average of the customers remaining on that Profile.

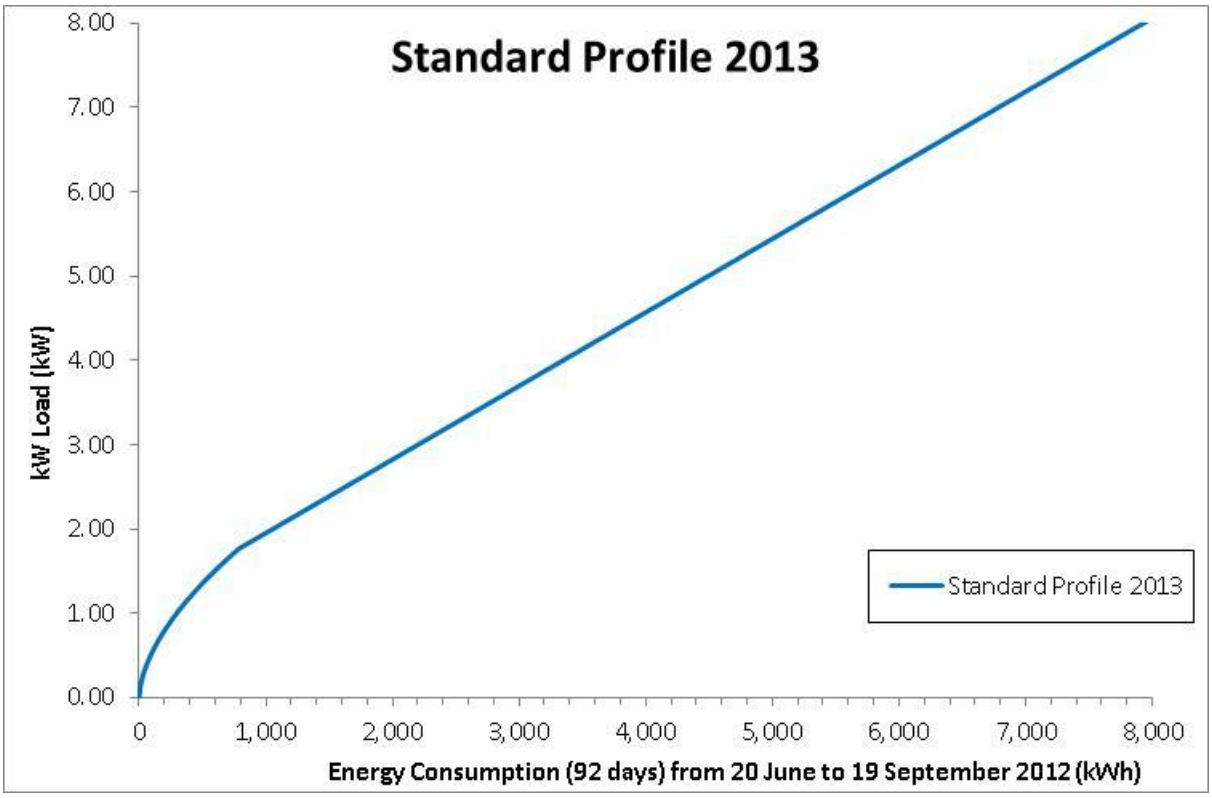
kW Load recalculations

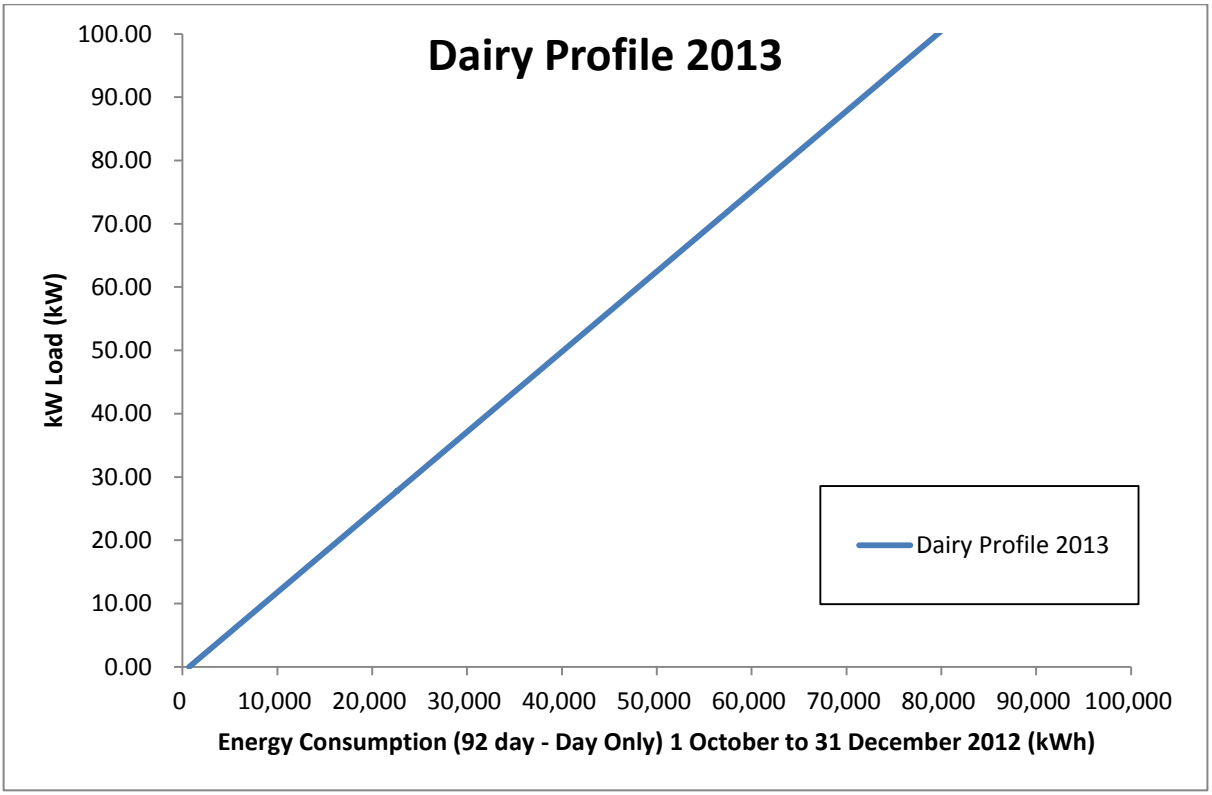
kW loads can only be recalculated for an installation with a standard meter if subsequent meter readings show that there was an error in the readings used for the original calculation. If there is such an error then the amended kW Load level shall take place with effect from 1 April. If kW loads have been calculated from a TOU meter then the load can only be recalculated if there was an error in the original calculation.

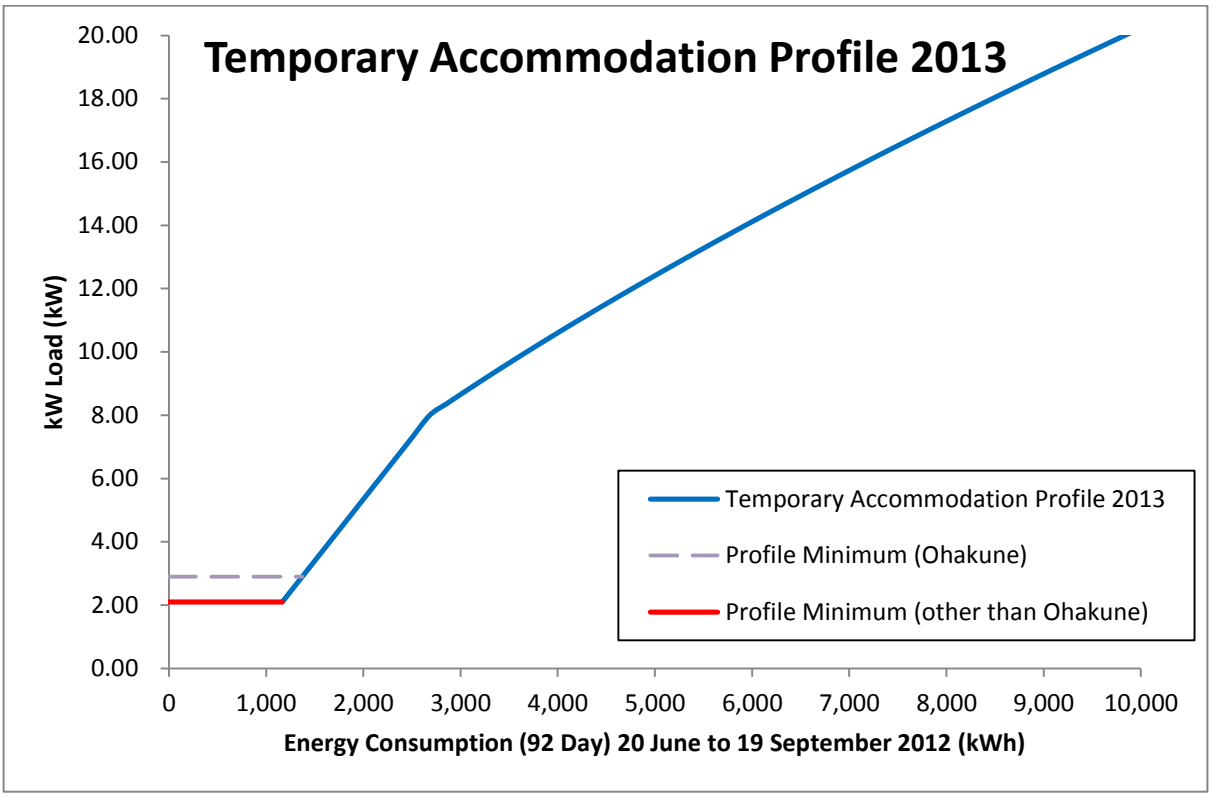
Load alteration policy

Load resets are not possible for parts of the year. Limited discretion exists to reset a load to the average of the past 5 years' loads for that installation in cases of proven hardship. TLC's policy concerning this is disclosed on its website.

kW load Profile Graphs






Temporary Accommodation Profile 2013
kW Load (kW)
20.00
18.00
16.00
14.00
12.00
10.00
8.00
6.00
4.00
2.00
0.00
0
1,000
2,000
3,000
4,000
5,000
6,000
7,000
8,000
9,000
10,000
Energy Consumption (92 Day) 20 June to 19 September 2012 (kWh)
Temporary Accommodation Profile 2013
Profile Minimum (Ohakune)
Profile Minimum (other than Ohakune)