



Nelson Electricity Limited
Pricing Methodology Disclosure
For the period beginning 1 April 2017

The following information is disclosed in accordance with the Electricity Distribution Information Disclosure Determination 2012 under Part 4 of the Commerce Act 1986.

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Director Certification

In accordance with the Commerce Act Electricity Distribution Information Disclosure Determination 2012

Pricing Methodology for the period beginning 1 April 2017

SCHEDULE 17 Certification of Year-beginning Disclosures

Clause 2.9.1

We, Oliver Rupert Kearney and David William Richard Dew, being directors of Nelson Electricity Limited certify that, having made all reasonable inquiry, to the best of our knowledge:

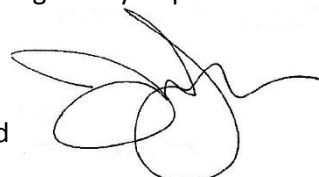
- a) The following attached information of Nelson Electricity Limited prepared for the purposes of clauses 2.4.1, 2.6.1, 2.6.3, 2.6.6 and 2.7.2 of the Electricity Distribution Information Disclosure Determination 2012 in all material respects complies with that determination.
- b) The prospective financial or non-financial information included in the attached information has been measured on a basis consistent with regulatory requirements or recognised industry standards.

Signed



Date 31 March 2017

Signed



Date 31 March 2017

Glossary & Abbreviations

Advanced Meter	A meter with the ability to measure energy use at various time intervals and with operational two way remote communications capability. Installed at a Category 2 ICP or lower ($\leq 500\text{Amps}$).
Connection	A point of connection to an electricity distribution network as identified by an installation control point (ICP) identifier.
Controlled Meter	A meter that measures load where there is functionality to control the energy provided to permanently wired appliances (e.g. a hot water cylinder) that are connected to the meter.
Customised price-quality path (CPP)	Regulatory limits on the average prices and the quality standards of non-exempt electricity distribution businesses, derived from business specific assumptions and information, following application by the business to the Commerce Commission.
Distributor	A company that owns or operates the power lines that transport electricity on local networks. Terms also used are 'distribution company', 'lines company' and 'network company'.
Default price-quality path (DPP)	Regulatory limits on the average prices and the quality standards of non-exempt electricity distribution businesses, derived from default industry methods, information and assumptions.
Electricity Industry Act 2010 (Act)	An Act that regulates the operation of the New Zealand electricity industry.
Electricity Industry Participation Code (Code)	The Code sets out the duties and responsibilities that apply to industry participants and the Electricity Authority.
Electricity Information Exchange Protocol (EIEP)	EIEPs provide a set of standardised formats for business-to-business information exchanges.
Information Disclosure (ID)	Electricity Distribution Information Disclosure Determination 2012.
Input Methodology (IM)	Electricity Distribution Services Input Methodologies Determination 2012.
Kilowatt hour (kWh)	A kilowatt hour is also known as a unit of electricity and is the basis of retail sales and reconciliation of electricity in the market.
Legacy meter	A meter that measures cumulative energy consumption (kWh) and does not have remote communications capability. Installed at a Category 2 ICP or lower ($\leq 500\text{Amps}$).
LFC Regulations	Electricity (Low Fixed Charge Tariff Option for Domestic Consumers) Regulations 2004.
Low Fixed Charge (LFC)	Low Fixed Charge.

Meter register	An energy measurement device on a meter.
Pass through cost	A cost defined in clause 3.1.2(1) of the IMs that a distributor can pass through to end-consumers in its prices, and includes territorial authority rates and industry levies.
Pass through price	Means the portion of an electricity distribution business' prices that are designed to recover pass-through costs and recoverable costs.
Peak Load	Peak half hourly demand, measured in kW or kVA.
Pricing Principles	The distribution pricing principles as published by the Electricity Commission in March 2010, adopted by the Electricity Authority.
Recoverable costs	A cost defined in clause 3.1.3(1) of the IMs that a distributor can pass through to end-consumers in its prices, including transmission costs, distributed generation allowances, and other regulatory allowances, wash-ups and incentives.
Time-of-use meter	A meter with the ability to measure energy use at various time intervals. Installed at a Category 3 ICP or higher (>500Amps).
Transmission	Conveyance of electricity at high voltages through the national grid.
Transmission network	New Zealand's national transmission network (national grid) owned by Transpower New Zealand Limited.
Uncontrolled Meter	A meter that measures load where there is no load control functionality.

The Electricity Authority also publishes a glossary of key industry terms on their website.

1. Introduction

Nelson Electricity Ltd is the company that delivers electricity to electricity users on behalf of energy retailers. Nelson Electricity is responsible for managing and operating the electricity distribution network in the central Nelson city area.

By way of brief background, Nelson Electricity was formerly the Municipal Electricity Department of the Nelson City Council. The Electricity Industry Reform Act 1998 required that all electricity companies split into either the supply business (generating and/or retailing electricity) or the delivery business (operating the local electricity network). In 1999, Nelson Electricity sold its retail operation to focus on its electricity delivery business.

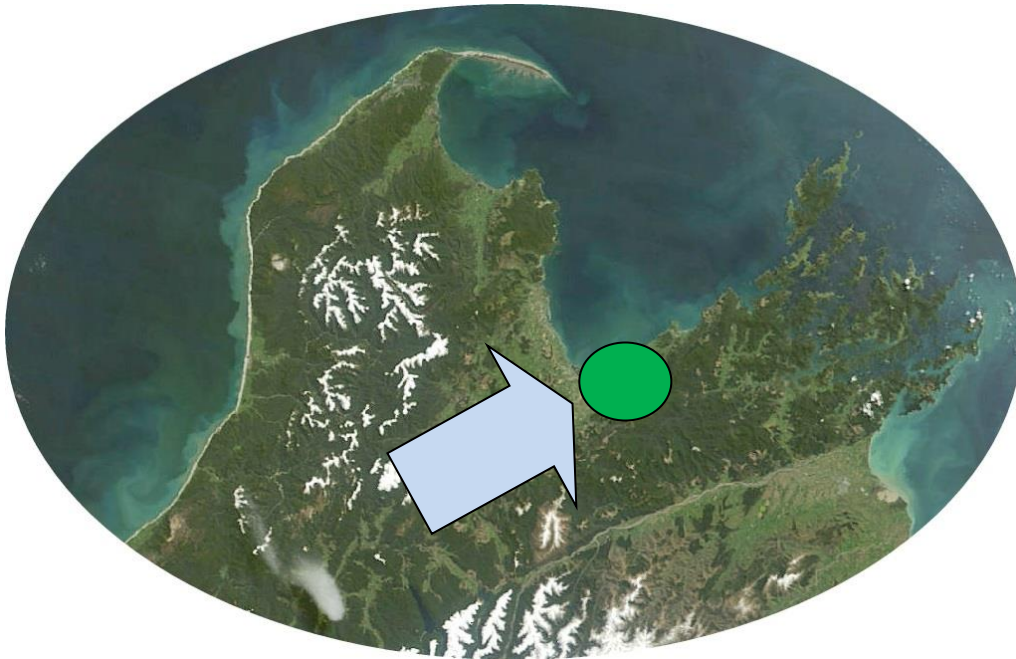


Figure 1 Nelson Electricity is located in Nelson city at the top of the South Island.

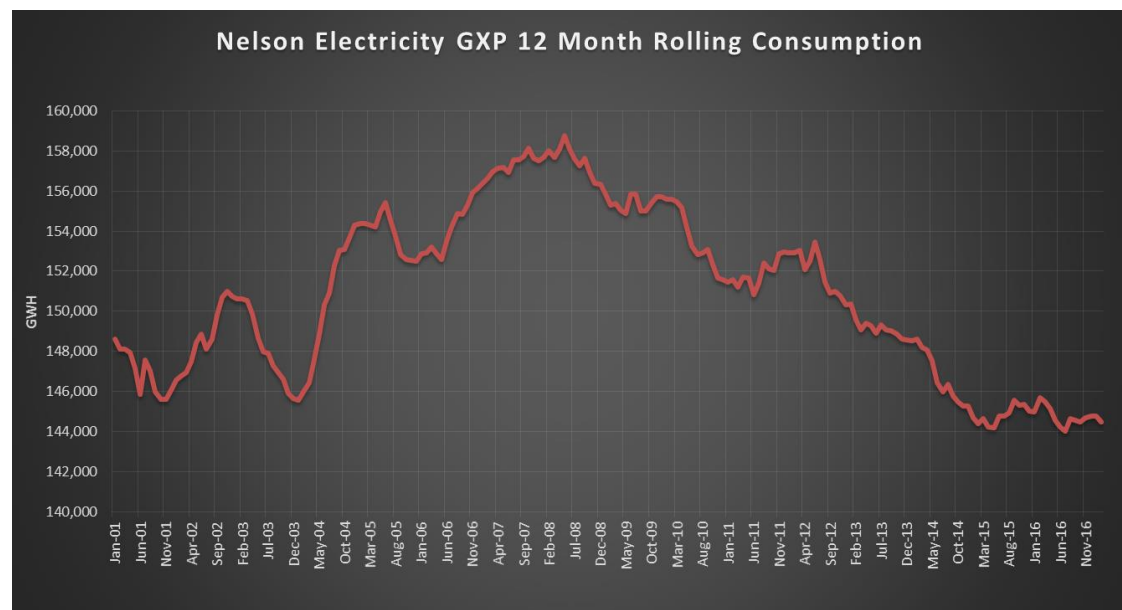
Nelson Electricity is owned by Network Tasman and Marlborough Lines, each holding a 50% shareholding. The day to day operations are managed by a small team of executives, and all maintenance and capital work is outsourced to approved contractors by way of contestable tendering of works.

The Nelson Electricity network comprises approximately 9200 connections in a concentrated area of 24 square kilometres in the central Nelson city area. The connections are largely CBD, industrial and dense urban. Nelson Electricity has a peak loading of 33.2MW, during winter months and distributes 139GWh annually through the network.

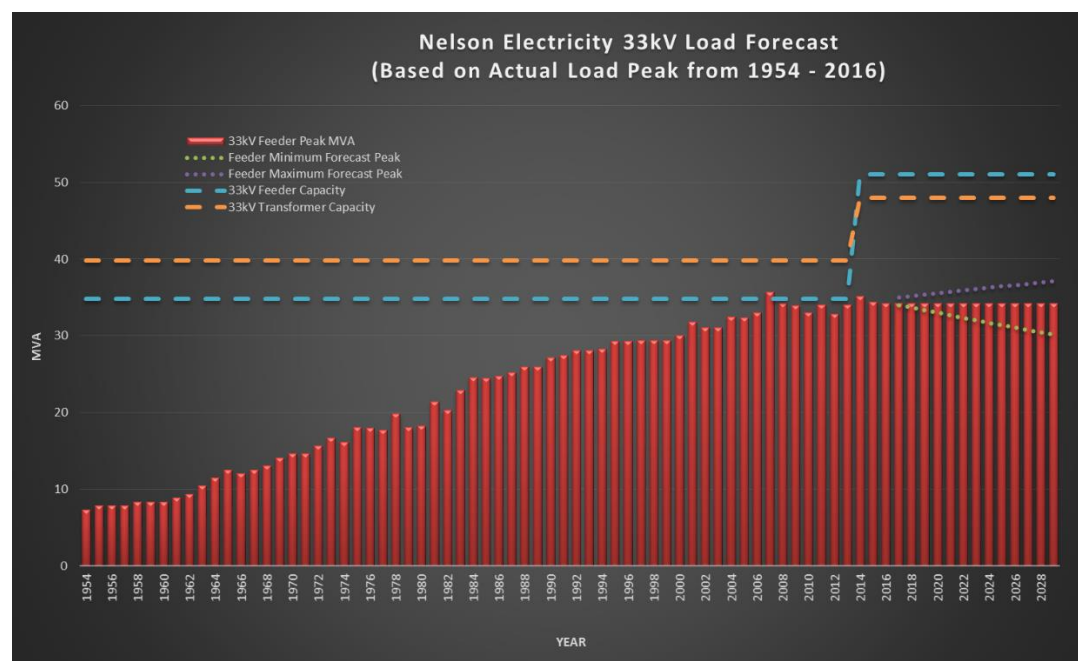
Nelson Electricity derives its transmission services via Transpower's Stoke substation which is 7km from Nelson Electricity's only zone substation at Haven Road.

Nelson Electricity up until 2008 had consistent kWh growth of approximately 1.0% -1.5% per year. Since then kWh consumption has been reducing at approximately 1.0% per year. The global financial crisis may have started the change in 2008 but it has continued due to a

mixture of energy efficient appliances, LED lighting, improvements in home insulation, energy conservation due to higher electricity prices and the installation of solar PV.



Peak demand up until 2008 was also increasing at the same rate as kWh at approximately 1.0% - 1.5% but since 2008 has flattened off but not decreased. The reason for peak demand growth has not tracked downward consumption is due to the lower utilisation of load control at peak demand times. Load control is now principally being used for minimising transmission peaks as there are now no upper network constraints on the Nelson Electricity network to manage load for. The graph following demonstrate how the peak demand has flattened since 2008.



The short to medium outlook for Nelson Electricity is a continued reduction in kWh consumption for the short to medium term for the three key reasons:

- On average every connection is using less electricity.
- There is limited opportunity for new load/connections as there is limited undeveloped land available in the central Nelson city area.
- Any redevelopment of land typically uses less electricity.

Declining consumption has ramifications due to the cost to manage the network is the same of which Nelson Electricity currently derives 48% of its revenue. So creates a situation under the current pricing structure where costs are spread over less kWh.

On top of declining consumption there is an increased uncertainty as to the effect of certain technologies and industry evolution will have and the role that the electricity network will play in the future as the key infrastructure that supports the Nelson community and economy. Key areas of focus are as follows:

- Increasing numbers of solar PV installations
- Increasing number of retailers providing many different pricing options for consumers
- Introduction of battery storage
- Electric vehicles and vehicle chargers
- Internet of things

The electricity consumer is likely to dictate the networks future with their decisions on uptake and utilisation of these technologies and switching to different pricing options as electricity retailers adapt and modify their offerings. Nelson Electricity is therefore having to review its network pricing structure to ensure it is fit for the upcoming changes and ensure that the network is sustainable for the long term.

The days where all electricity being sourced via the transmission system is disappearing. With distributed generation being installed the opportunity for new consumers with peer to peer trading of electricity is possible. The likely introduction of home scale batteries in years to come will take this opportunity a step further. Nelson Electricity has to adapt to ensure the network can facilitate the changes and staying relevant for the community it serves.

Nelson Electricity is actively working with the Electricity Network Association and also neighbouring networks to develop a form of service-based pricing that will meet the changing landscape. This will achieve two things:

- Ensure as much as practicable that all electricity consumers pay “their fair share” of the costs to provide the electrical infrastructure.
- The electricity consumer is able to make rational choices when investing in any new technologies.

It was envisaged last year that a new pricing structure would have been introduced for 1 April 2017 but due this has not been possible for a number of reasons which are discussed in Section 7.

2. Regulatory Requirements

Nelson Electricity is a natural monopoly and is not directly exposed to the competitive forces that drive other markets to deliver improved efficiency and service. To this extent Nelson Electricity is classed as non-exempt from the control regime under the regulations for electricity network owners under the Commerce Act 1986. This means that Nelson Electricity has to comply with the Electricity Distribution Services Default Price-Quality Path Determination 2015 (DPP) administered by the Commerce Commission. Nelson Electricity also has to comply with the Electricity Distribution Information Disclosure Determination 2012 under Part 4 of the Commerce Act 1986 of which includes the disclosure of its Pricing Methodology. Recent changes also require the pricing methodology to demonstrate how the Nelson Electricity pricing is in line with the Electricity Authority Distribution Pricing Principles.

Nelson Electricity has taken all requirements into account in the preparation of this document.

2.1 Electricity Distribution Services Default Price-Quality Path Determination

Nelson Electricity has to comply with the Electricity Distribution Services Default Price-Quality Path Determination 2015 (DPP). The Commerce Commission reset the Price-Quality path every five years. The 2017/18 year will be the third of the current five year path from 1 April 2015 – 31 March 2020. Actual prices multiplied by actual quantities of two years previous must not exceed the price path.

2.2 Electricity Distribution Information Disclosure Determination

The key requirements in complying with the disclosure of pricing methodologies is outlined in 2.4.1 – 2.4.5 of the Electricity Distribution Information Disclosure Determination 2012. The requirements outline the framework to demonstrate to the “Interested Person” how Nelson Electricity allocates costs to different Load Groups and the basis on how prices are set.

2.3 Electricity Authority Distribution Pricing Principles

The Commission’s final pricing principles are as follows:

Electricity Authority Pricing Principles
(a) Prices are to signal the economic costs of service provision, by:
(i) 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;
(ii) having regard, to the extent practicable, to the level of available service capacity; and
(iii) Signalling, to the extent practicable, the impact of additional usage on future investment costs.
(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.

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

Nelson Electricity Commentary on compliance with Electricity Authority Pricing Principles.

Nelson Electricity has prepared this pricing methodology in accordance with or as close as possible to the Electricity Authority Pricing Principles. It has to be recognised that consumer behavior as a response to network pricing is limited. The line prices represent approximately 30% of the total electricity invoice they receive from electricity retailers so unless a network can significantly amplify or exaggerate the pricing differential levels then the consumer behavior will be based on what the electricity retailer wants to achieve. In addition to that in the setting of controllable line charges, any incentives in these areas are often reduced further through the interface the customer has with their electricity retailer. Additional meter costs for measuring controllable loads are typically loaded onto the controllable price further reducing the pricing incentive for the line price option.

Prices are set attempting to minimise cross subsidisation and price discrimination between load groups. A key success has been in the mass market with the combining of business and residential tariffs, excluding those who qualify and have the opted to be on the low fixed charge option as per the Electricity (Low Fixed Charge Tariff Option for Domestic Consumers) Regulations 2004. This has reduced published pricing options for the mass market consumers also simplifying the pricing for electricity retailers to apply to their customers.

Upon completion of the new zone substation at Haven Road and installation of the new 33kV feeder in 2014, there has been changes in cost allocations given the reduced requirement for utilisation of ripple control for network related constraints or operational requirements. Ripple is now principally was for minimising transmission related constraints so reducing transmission costs for consumers. Notwithstanding any material changes in growth forecasts or transmission pricing levels or transmission pricing methodology it is

expected that line prices will remain around similar levels in real terms but there is a potential for transmission costs to lower if the targeted use of ripple control is effective.

Nelson Electricity does not have any other significant expenditure projects in the coming years that will materially affect line charges.

Nelson Electricity currently offers a line price option for larger consumers to be on Time of Use (above 150kVA is compulsory). This option is of benefit if those consumers can manage their load during peak winter demand times and also incentivises the reduction of fused capacity. The consumer can choose what level of supply they require and will be charged accordingly. Noting that the winter demand charges are set in the winter and applied for the following 12 months from 1 October each year.

The Nelson Electricity pricing structure has remained stable for a number of years. The structure promotes stability and certainty. This does also minimise the transaction costs for retailers. The pricing is transparent and all retailers have access to and are charged the same line charges for each different classification of consumer. Nelson Electricity has also taken into account retailer feedback into line charges. An example is the removal of a ripple control charge which was not part of the consumer's line charge and was charged on a per retailer basis. The charge was rolled into the consumer line charges, this assisted retailers in reducing transaction costs.

Overarching the network pricing is that Nelson Electricity take into account the requirements of its stakeholders. These are as follows:

Stakeholder	Interests
Electricity Customers	Delivery of a safe, reliable, efficient and sustainable supply of electricity at minimum cost. Surveys across the board say that most consumers do not want to pay more for a more reliable network.
Electricity Retailers	Delivery of a safe, reliable, efficient and sustainable supply of electricity at minimum cost. Diverse views on pricing options / standardisation and transparent pass through.
Government (Ministry of Innovation and Economic Development, Commerce Commission, Electricity Authority)	Legislate and control compliance of statutory requirements and economic efficiency.
Landowners	Landowners with Nelson Electricity assets on their property have interests in safety, easements and access requirements.
Property Developers	Property developers wish to ensure that connection policies and costs are fair and that network expansion plans are timely.
Shareholders	Achievement of an adequate return on investment and good corporate citizenship.
Territorial Local Authorities	Territorial authorities have interests in minimising environmental impacts, development of underground power systems, local economic development and in the control of assets in road reserves.
Transit NZ	Transit NZ are interested in controlling assets in road reserves.
Transpower	Nelson Electricity relies on the Transpower grid to deliver electricity through to the Nelson Electricity network and Transpower relies on the Nelson Electricity network to deliver the electricity to end use customers.

Stakeholder interests have been identified and accommodated in the pricing of Nelson Electricity line charges through the following processes:

- The Nelson Electricity Board of Directors agrees to an annual Statement of Corporate Intent which details corporate strategy with respect to pricing.
 - To ensure the Company complies with all legislative requirements including health and safety legislation and all industry initiatives in respect of public safety and health and safety in the workplace;
 - To operate as a successful business in the distribution of electricity and other related activities;
 - To have regard among other things the desirability of ensuring the efficient use of electricity;
 - To ensure that all services and responses to maintenance and fault requirements are provided with an appropriate standard of customer service;
 - To maintain existing levels of reliability;
 - To have consideration of the consumer for price and quality;
 - To improve operational efficiency and productivity;

- To adopt non-discriminatory pricing and network access policies for all users of the Nelson Electricity network;
- To ensure that all resources, financial, physical, and human are utilised efficiently and economically;
- To achieve a commercially acceptable return and to seek to maximise the longer term value of shareholder's funds;
- To provide for future development of the network through investigation and the acquisition of land and physical assets as is appropriate;
- To ensure the company complies with all legislative requirements including health and safety legislation, and all industry initiatives in respect of safety in the workplace;
- To be a good employer providing;
 - ✦ Remuneration consistent with performance,
 - ✦ A safe, satisfying and stimulating work environment,
 - ✦ Equal employment opportunities.
- Corporate organisational goals and objectives support the pricing methodology consistent with the corporate mission.

"Nelson Electricity's principal mission is to own and operate the electricity network within the central Nelson area commensurate with appropriate standards of maintenance and reliability of supply whilst maximising shareholder value and providing a commercially acceptable return."

- Regular surveys of residential, commercial and large user customers provide valuable feedback on pricing, security and reliability of supply which assists in network planning, and on the price-quality trade-off. The key outcome is the majority of consumers are happy with current quality and don't want to pay any more for improved quality. Consumers also are not willing to subsidise the line charges of those investing in new technologies.
- Government and territorial authority legislation provides a key input into the way pricing is set.

Any conflicting stakeholder interests are managed by systems that ensure that appropriate levels of separation, accountability and authority are in place. Pricing decisions are ultimately made at Board level with appropriate supporting evidence and recommendations from the General Manager.

3. Distribution Network Characteristics

Nelson Electricity is supplying the following types of connections:

- Unmetered - 52 connections
- Residential – 7666
- Small / Medium business – 1398
- Larger Business (Time of Use) – 93

The Nelson Electricity pricing combines the residential and small/medium businesses (Load Group 2) for the purposes of pricing as the characteristics are similar. The imposition of the Low User Fixed Charge Option has forced Nelson Electricity to introduce the low fixed charge option for residential consumers using less than 8,000kWh per year (Load Group 1), which does result in some cross subsidisation between the two groups 1 and 2.

The network is centred on the business district of Nelson City and also the Port area, it has a larger proportion of business connections compared to most other networks in New Zealand as a result the network peaks are typically experienced in the morning instead of early evenings. The Nelson Electricity network peaks are highest during the colder winter mornings when business load increasing to start the day and residential is dropping off after the morning breakfasts and showers, there is also a considerable level of electrical heating load as well.

Nelson Electricity is a small network and as such there is no benefit in segmenting into different pricing areas. The prices are applied evenly across the whole network.

The Nelson Electricity network is surrounded geographically by the Network Tasman network to the north and south. There is the ability for a very small number of consumers to bypass the Nelson Electricity network where the neighbouring electrical infrastructure is nearby. The cost to bypass in almost all situations is uneconomic given the cost to install network infrastructure versus the payback through any potential reduced line charges. Nelson Electricity would review any instance of potential uneconomic bypass and if necessary look at a non-standard pricing arrangement.

4. Discussion on the existing pricing regime.

The existing Nelson Electricity pricing has been developed and modified to cater to the changing dynamics of the Nelson Electricity network and to ensure there is a fair allocation of costs applied to all consumers where possible. Given the network is small geographically, there is no real benefit to have multiple pricing regions. Nelson Electricity sells capacity, the ability for electricity retailers to supply consumers with electricity. The consumer capacity limit is based on the fuses at the network connection point. The larger the fuses the greater the capacity available to the consumer at any time which potentially leads to higher capacity network infrastructure requirement to supply the network connection point.

4.1 Time of Use

The Time of Use pricing regime has not been materially changed since its introduction in the early 1990's. The line prices are split in to five separate categories and priced accordingly so to ensure there is minimal cross subsidisation between consumers. The pricing is transparent and the prices should incentivise the consumer to alter behaviour to minimise its line charges.

For Time of Use consumers the pricing is centred on the connection capacity (size of fuses or transformer) and contribution to the network and transmission peak demand. The consumer has the ability to change both of these to reduce their overall line charges and also assist in making the Nelson Electricity network more efficient. Most of the efficiency gains have already been achieved in this group given the pricing has been in place for a long period of time.

The weighting of the pricing has been modified between the categories over time to cater to the changing pricing signals required for the load group to match changing costs.

4.2 Mass Market

All Business and Residential consumers (except consumers on the low fixed charge tariff option) have been grouped together to optimise the Nelson Electricity mass market pricing. There used to be a pricing differential between business and residential consumers and over time this differential was reduced and finally removed in 2009. It finally made it possible to link the two consumer groups together as it is also now extremely difficult to differentiate between the two groups where often there are businesses operating from home, or bed and breakfasts as examples. The linking of the groups also reduced the number of published line prices and simplified the pricing to be disclosed making it easier for retailers to administer Nelson Electricity prices and consumers easier to understand.

Nelson Electricity also wanted to incentivise larger mass market consumers to optimise their electrical consumption and capacity, this was achieved by changing the daily fixed line charge which was a one size fits all to a charge based on actual fuse size. This means that the larger mass market consumers pay a fixed line price based on their connected fuse size which is their ability to consume a higher electrical demand. They also have the ability to reduce their fuse size (free of charge) if they can change their load consumption behaviour. This line price option has proven successful with many consumers opting to have their fuse sizes reduced which then provides for reserved network capacity to be utilised elsewhere.

Larger consumers in this group can also opt to go on to the Time of Use tariff if there is a benefit for them to manage their load further. This option is however seldom taken up. There is more of a migration from Time of Use tariff to mass market, and this is a result of the retail pricing options rather than the Nelson Electricity network pricing.

4.3 Electricity (Low Fixed Charge Tariff Option for Domestic Consumers) Regulations 2004

One complication in this new capacity based fixed line charge is the Electricity (Low Fixed Charge Tariff Option for Domestic Consumers) Regulations 2004 which has meant that residential consumer using less than 8,000kWh must have access to a fixed line charge price of at most 15 cents per day. To comply with this regulation and to minimise price options, Nelson Electricity has assessed all residential consumers fuse capacity at 15kVA. Currently a residential consumer with a larger fuse size is only paying the standard price of the typical 15kVA connection.

The compounding effect is that the average residential consumer on the Nelson Electricity network currently uses approximately 6,750 kWh per year (based on 2015 consumption analysis) compared to 7,400kWh per year in 2008. This is 15% lower than the deemed average consumer as determined under this regulation. This exposes Nelson Electricity to more cross subsidisation as more consumers switch to this tariff. Of concern to Nelson Electricity is currently up to 70% of all residential consumers would benefit from being on the Low Fixed Charge option (Group 1).

Nelson Electricity is exploring options to remedy this issue to minimise the cross subsidisation that this regulation has created as it undermines the ability to adapt prices for changes in the network utilisation characteristics. Currently the consumers on Group 2 and Group 3 are subsidising the consumers on Group 1.

5. Changes to the 1 April 2017 Pricing

The Nelson Electricity line charges will be changing 1 April 2017. There are no new prices being introduced or deleted from the delivery price schedule. There has been some terminology changes as described in section 10 due to Nelson Electricity preparing this disclosure document to be in line with the Electricity Networks Association – Pricing Guidelines for Electricity Distributors 2016.

The last line price change was the introduction of a distributed generation price of 0.5 cents per kWh for energy injected onto the network in 2014. This was introduced to capture some of the incremental costs of these installations like safety audits at the network connection points. The site is checked to ensure the voltage is within the regulatory limits and that the site does not inject into network when street supply is lost.

In round terms, the new delivered line prices from 1 April 2017 will be decreasing by approximately 3.0% overall.

6. Derivation of Line Prices

The Derivation of Line Prices are described in the following sections.

- Customer Groups
- Customer Group Statistics
- Allocation and Recovery of Network and Transmission Charges
- Cost Recovery per Load Group
- Fixed v's Variable Charges

6.1 Consumer Groups or Load Groups

Nelson Electricity has split its consumers into five distinct consumer groups/ load groups to assist in the fair allocation of costs and setting line price levels. The Groups are based on the type of connection which considers typical load patterns, fuse size and annual kWh consumption. The number of groups is set at five as a balance between minimising complexity and ensuring costs are appropriately apportioned between consumers. The groupings are relatively in line with other electricity networks in New Zealand.

- **Load Group 0**
Unmetered Load or Metered Builders Temporaries. This group in broad terms is for the smaller/lower fused connections (under 15kVA) either metered or unmetered that do not fall into the other groups as listed below. Most of the connections are either metered builders temporary supplies or small unmetered supplies to telephone boxes and streetlights. This group has smaller connections with differing load characteristics so a fair allocation of costs is difficult to demonstrate but the overall revenue of this group is only 0.05% of total revenue (excluding local council streetlights), so they are grouped together.
- **Load Group 1**
Residential consumers Low Fixed Charge Option– Connections that are a residential home that exhibit a typical residential load profile using less than 8000kWh per year as defined by the Electricity (Low Fixed Charge Tariff Option for Domestic Consumers) Regulations 2004. The connection size is set at 15kVA. The Nelson Electricity Limited (NEL) Network Code allows for single phase 60amp, two phase 40 amp or three phase 30amp supplies to be classed as a residential connection. A residential type load profile not on the Low Fixed Charge option are typically categorised as Load Group 2.
- **Load Group 2**
Residential and Small Business consumers – Connections that are 15kVA up to 150kVA. Residential consumers not on Low User Option are also in this group. The residential and small business consumers are grouped together as much as Electricity (Low Fixed Charge Tariff Option for Domestic Consumers) Regulations 2004 allow. Electricity networks key costs are driven based on capacity (the ability for a consumer to take as much electricity up to the fused capacity at the Nelson Electricity network connection point). While there is a difference in load profiles from a typical business and a domestic connection it is proving more difficult as time goes on to differentiate between the two as many connections are a mixture of the two. To avoid complications in grouping allocations and number of tariffs, Load Group 2 joins the two consumer types together. By doing this has removed any price discrimination that existed when business and residential were grouped separately.
- **Load Group 3**

Time of Use consumers with supply up to 2400kVA. This group is for any connection with a supply up to 2400kVA that wants to be on a Time of Use tariff. Time of Use tariffs were first offered to consumers in the early 1990's and the early rationale for the consumer being in this Group was if they used greater than 50,000kWh per year. The kWh requirement has since been removed and a mandatory requirement of connections with a capacity of greater than 150kVA to be Time of Use introduced, those below that limit can opt to be on Load Group 2 or Load Group 3. This group is ideal for consumers that have the ability to manage their peak demand to minimise line charges as the line charge regime for this group more accurately reflects the consumer's fair allocation of costs.

- **Load Group 4**
Consumers with capacity supplied of greater than 3000kVA with supply from a dedicated 11kV/400V substations. This group is for the larger consumers on the network that also receive a supply from dedicated substations and 11kV infrastructure.

6.2 Consumer Group Statistics

Statistics are collected and analysed as per the customer groupings as described in the previous section. This information is used as a base to NEL's pricing allocations as described further in this report. Information used for the 2017/2018 year is as follows:

- Number of Connections per group.

Number of Connections	
Load Group	Connections
0	52
1	3707
2	5388
3	92
4	1
Total	9,240

- Anytime Peak per group.

Anytime Peak	
Load Group	Peak kVA
0	250
1	12,604
2	21,552
3	14,525
4	3,110
Total	52,041

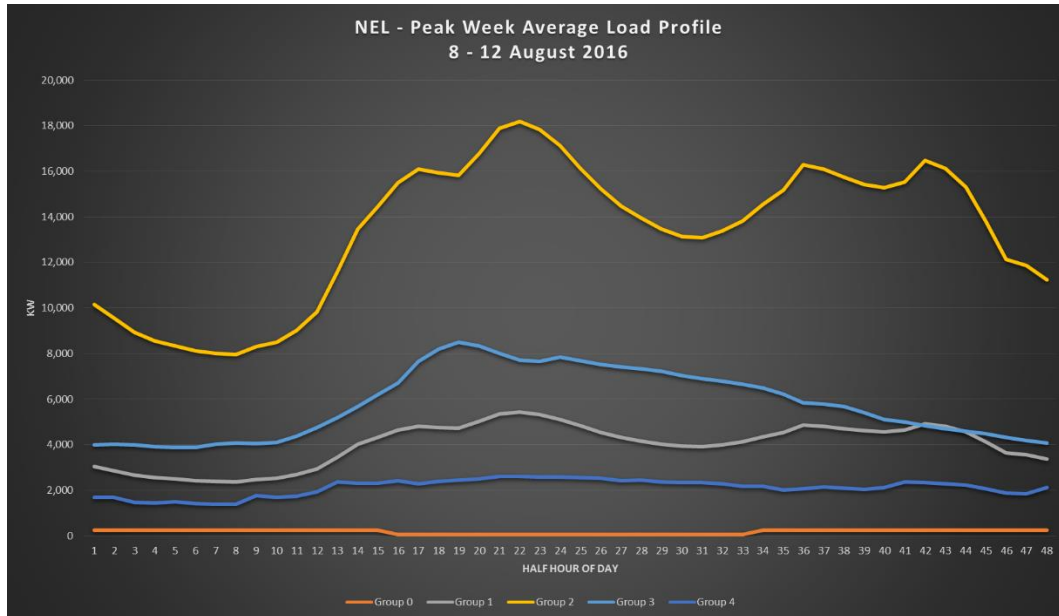
This is an assessment of each connections peak demand grouped into the five load groups.

- Winter Demand Peak per group.

Control Period Demand (Winter Demand)			
kVA			
Load Group	8:30 am - 11:30 am	5:00 pm - 6:00 pm	CPD Allocation
0	50	250	130
1	5,429	4,864	5,203
2	18,174	16,285	17,419
3	7,720	5,833	6,965
4	2,617	2,077	2,401
Total	33,940	29,060	32,118

NEL has a winter load that peaks between 8:30am - 11:30 am and 5:00 pm - 6:00 pm. The morning load is predominantly business load with the morning residential load dropping off and the evening peak is typically influenced by the residential load with the business load dropping off. The statistics required are to ensure the right pricing signals are sent to each group and that charges are as fair and equitable as possible to all connections. The Winter Demand is a critical part to the allocation of Transmission Costs between groups. It is also important when allocating costs for local network in allocating costs based on load group contribution to peak demand and maximum loading on assets).

The graph below shows the average peak winter load profile for the highest consumption week Monday 8th August 2016 – Friday 12th August 2016.



- GWh per group.

GWh			
Load Group	Winter	Summer	Total
0	0.52	0.54	1.06
1	9.40	8.50	17.89
2	31.44	31.75	63.19
3	19.32	24.01	43.33
4	6.16	7.15	13.30
Total	66.83	71.95	138.78

These figures are estimated consumption per Load Group with no loss allocation back to GXP. Winter months are May – September, Summer months are October – April. This is consumption only and is not offset by any distributed generation. The total consumption exported onto the Nelson Electricity network for the year ending February 2017 was 0.24 GWh compared to 0.22 GWh for the previous 12 months.

- Regulatory Value of System Fixed Assets as at 31 March 2015 per group allocation

Asset Group	Regulatory Value of System Fixed Assets					Total
	0	1	2	3	4	
33kV Lines	\$34,953	\$799,493	\$2,756,495	\$1,541,386	\$491,673	\$5,624,000
Zone Sub	\$62,013	\$1,418,446	\$4,890,524	\$2,734,700	\$872,317	\$9,978,000
11kV Lines	\$40,857	\$934,542	\$3,222,119	\$1,801,755	\$574,726	\$6,574,000
11kV/400V Sub	\$35,636	\$881,435	\$3,037,569	\$1,571,534	\$207,825	\$5,734,000
400V Lines	\$58,799	\$1,792,729	\$6,190,321	\$1,419,150	\$0	\$9,461,000
Other	\$23,175	\$530,105	\$1,827,697	\$1,022,018	\$326,004	\$3,729,000
Total	\$255,434	\$6,356,750	\$21,924,726	\$10,090,544	\$2,472,546	\$41,100,000

Regulatory Asset Base Valuation allocation is assessed on each load group's utilisation of assets. As an example, Group 4 does not utilise any of the 400V lines so there is no value assigned.

- Cost of Capital

For the financial year commencing 1 April 2017 Nelson Electricity being a price controlled EDB, has used the Commerce Commission's WACC for the 5 year DPP price control period 1 April 2015 -31 March 2020. This 7.19% set at the 67th percentile (midpoint 6.72%).

The parameters used by the Commission in setting WACC are:

Parameters used to calculate vanilla WACC for EDB DPP and Transpower IPP (for the period commencing from 1 April 2015)	
Parameter	Estimate
Risk-free rate	4.09%
Debt premium	1.65%
Leverage	44%
Equity beta	0.61
Tax adjusted market risk premium	7.0%
Average corporate tax rate	28%
Average investor tax rate	28%
Debt issuance costs	0.35%
Cost of debt	6.09%
Cost of equity	7.21%
Standard error of debt premium	0.0015
Standard error of WACC	0.011
Mid-point vanilla WACC	6.72%

Note: The cost of debt is calculated as the risk-free rate + debt premium + debt issuance costs. The cost of equity is calculated as the risk-free rate × (1- investor tax rate) + the equity beta × the tax adjustment market risk premium. The mid-point vanilla WACC is calculated as the cost of equity × (1 - leverage) + the cost of debt × leverage.

On the basis of the above input parameters, the NEL Weighted Average Cost of Capital (WACC) is 7.19% of Regulatory Asset Base = \$2,955k.

6.3 Allocation and Recovery of Network and Transmission Charges

Network Charges are set to recover indirect operating costs, direct operating costs, depreciation and cost of capital. The setting of the charges also takes into account historical charging practices and methodologies.

The company annual revenue requirements for 2017/2018 are:

Operating Costs (Network R&M)	\$724k
Transmission Costs	\$3,364k
Overhead Costs	\$1,736k
Depreciation	\$1,521k
Target Return (before tax)	\$2,680k

With Nelson Electricity being a small predominantly urban network there was no need to sectionalise it into separate pricing areas. There is however one rural uneconomic line supplying a small number of consumers of which a separate pricing option is being considered for the following year.

6.4 Cost Recovery per Load Group

Following is a table outlining the cost recoveries per load group.

Load Group	Operating	Transmission	Overhead	Depreciation	Target Return	Total
0	\$44,500	\$23,294	\$9,055	\$9,453	\$25,436	\$111,737
1	\$117,603	\$449,297	\$558,455	\$238,587	\$300,544	\$1,664,486
2	\$406,702	\$1,636,900	\$865,616	\$824,475	\$1,699,036	\$5,432,729
3	\$134,799	\$982,502	\$250,908	\$357,253	\$601,177	\$2,326,639
4	\$20,396	\$292,550	\$51,966	\$91,232	\$33,264	\$489,407
Total	\$724,000	\$3,384,543	\$1,736,000	\$1,521,000	\$2,659,457	\$10,025,000

The methodology used for the above cost apportionment is as follows:

Operating Costs – Operating costs is the Operational Expenditure Budget that covers both the planned and unplanned network R&M expenditure on the network. The Operational Expenditure Budget is split into the different asset types as per the Regulatory Asset Value of System Fixed Assets table groups. The asset group expenses are then allocated to each load group first based on whether the Group utilises that class of asset (eg Group 4 does not utilise the 400V network so does not contribute towards those associated costs) then through the assessed balance of each groups kWh consumption (60%) and Winter Demand contribution (40%). This percentage allocation attempts to provide a balance between a Groups peak demand utilisation and overall usage. Some re balancing is required for load group specific costs, e.g Group 0 where actual Council streetlighting associated maintenance costs of \$40,000 are directly allocated to the associated tariff, this allocation is offset against Group 1 and 2 apportioned based on kWh.

Regulatory Value and Operating Cost Percentage Allocation						
	0	1	2	3	4	Total
33kV Lines	0.62%	14.22%	49.01%	27.41%	8.74%	100.00%
Zone Sub	0.62%	14.22%	49.01%	27.41%	8.74%	100.00%
11kV Lines	0.62%	14.22%	49.01%	27.41%	8.74%	100.00%
11kV/400V Sub	0.62%	16.58%	57.37%	21.93%	3.50%	100.00%
400V Lines	0.62%	19.17%	66.51%	13.70%	0.00%	100.00%
Other	0.62%	14.22%	49.01%	27.41%	8.74%	100.00%

Operational Cost Allocation						
Asset Group	0	1	2	3	4	Total
33kV Lines	\$222	\$5,073	\$17,490	\$9,780	\$3,120	\$35,685
Zone Sub	\$263	\$6,022	\$20,762	\$11,610	\$3,703	\$42,359
11kV Lines	\$412	\$9,425	\$32,497	\$18,172	\$5,796	\$66,303
11kV/400V Sub	\$655	\$17,486	\$60,499	\$23,120	\$3,688	\$105,449
400V Lines	\$2,045	\$63,078	\$218,845	\$45,093	\$0	\$329,062
Other	\$902	\$20,633	\$71,139	\$39,780	\$12,689	\$145,143
Sub Total	\$4,500	\$121,717	\$421,232	\$147,555	\$28,996	\$724,000
Reallocation	\$40,000	-\$8,827	-\$31,173			\$0
Total	\$44,500	\$112,890	\$390,059	\$147,555	\$28,996	\$724,000

- **Transmission Costs** –Transmission costs are an unavoidable cost, it covers the upstream costs from our subtransmission connection point at STK0331. The major component in transmission costs is the Interconnection charge -Regional Coincident Peak Demand (RCPD) of the top of the south. Transmission peaks are typically encountered during the winter period. Transmission costs are apportioned based on each groups influence. This is achieved through peak demand analysis of each group as is being applied through transmission pricing. Groups 0, 1 and 2 currently recover transmission costs 100% via the kWh charge and for Groups 3 and 4 via a mixture of winter control period demand charge (45%) and a kWh charge (55%).
- **Overhead Costs** – Are apportioned by using two measures; the number of network connections and the maximum demand of the load group. This gives a balance of spreading overhead costs between the business of selling capacity and the number of consumers connected.
- **Depreciation** – This is apportioned by using the assessed depreciation using the NEL Regulatory Asset Base model as a base and follows the same rationale as Operating Costs (except without re-allocation of Load Group specific costs).
- **Target Return** - This is apportioned to load groups as per the Regulatory Asset Base % split per load group as per the rationale of the operating costs. It is however important to note that the Regulatory Asset Base valuation for assets installed prior to 2004 still undervalues the underground network value and so the target return takes this into account.

6.5 Fixed v's Variable Charges

The proportion of charges that are deemed by Nelson Electricity as fixed or variable have been set based on the historical pricing methodologies. Nelson Electricity has maintained a pricing mix that has been consistent for well over ten years and as this pricing methodology has worked well, there has been no compelling reason to change the proportions to any significant degree other than a minor incremental shift to a higher proportion of fixed charges.

The only major variation has been the provision of a low daily fixed charge option for Residential consumers as required under the Electricity (Low Fixed Charge Tariff Option for Domestic Consumers) Regulations 2004. This introduces a cross subsidisation, which the pricing structures of previous years had been designed to remove.

Currently overall the proportions between fixed and variable line charges are 52% Fixed and 48% Variable, this compares to 50% Fixed and 50% Variable in 2007. Groups 1 and 2 have a higher variable proportion while groups 3, 4, and 5 have a higher fixed proportion. Refer to the table below.

Fixed V's Variable	Fixed		Variable		Total
	%	\$	%	\$	\$
Group 0	98%	\$109,973	2%	\$1,764	\$111,736
Group 1	11%	\$190,647	89%	\$1,473,822	\$1,664,469
Group 2	49%	\$2,674,142	51%	\$2,758,530	\$5,432,671
Group 3	76%	\$1,776,701	24%	\$549,914	\$2,326,615
Group 4	100%	\$489,402	0%	\$0	\$489,402
Total	52%	\$5,240,864	48%	\$4,784,029	\$10,024,893

It has to be recognised that consumer behavior as a response to network pricing is limited. The line charges are only 30% of the total electricity invoice consumers receive from electricity retailers so unless a network can significantly amplify or exaggerate the pricing differential levels then the consumer behavior will be based on what the electricity retailer wants to achieve.

Nelson Electricity is in the business of selling electrical capacity to consumers and most of its costs as identified in section 6.4 are fixed. If the true proportion of fixed and variable costs were charged in the same proportions to all consumers, the fixed charge proportion of groups 0, 1 and 2 consumers would increase significantly with the variable charges reduced. The incremental cost of any consumer using more kWh's while not increasing their peak demand is extremely low compared to a consumer wanting more capacity which there is a cost associated with the increases in peak demand.

For further breakdown on the revenue influence of specific tariffs, refer to Section 12 Price / Quantity / Revenue Schedule.

- **Load Group 0 – Unmetered and Builders Temporary**

Builders Temporary (metered) - Network costs are broken down into the following:

- Daily Price (Fixed)
- Uncontrolled kWh Price.

For the average Builders Temporary, fixed prices recover approximately 60% of total network costs.

Unmetered Supply – Network costs are fully fixed with no variable component.

Load Group 0 prices are predominantly fixed given the low consumption not making metering not practical and uneconomic for retailers in most cases. The only metered load in Group 0 is for builder's temporary connections. This type of connection is in Group 0 as the fuse size is low (limited to single phase 30 amps), the consumption is typically low, the load characteristics don't fit other load groups and the revenue impact is low.

- **Load Group 1 – Residential Consumers (Low Fixed Charge Option)**

Network costs are broken down into the following:

- Capacity Supplied Price is based on connection capacity of 15kVA

- Variable kWh Price. This price value depends on whether the load is controlled by ripple control or uncontrolled. The controlled prices are lower than the uncontrolled price as Nelson Electricity can ensure they are turned off at peak times therefore reducing peak demand associated costs. The main peak time cost is the transmission, which ultimately accounts for 33.6% of the total line charge revenue. There are two controlled options:
 - a. Controlled (Hot water) – This is a key network control option to control supply to all hot water cylinders on the network. This can manage up to 10% of network load at peak demand times approximately 3MW. Typically supply is only controlled during the winter peak demand times to minimise transmission costs. Also used for other emergency load management purposes.
 - b. Night Only - This is an option for consumers that can utilise electricity in off peak times between 11pm and 7am, typically used for larger hot water cylinders and night storage heaters.

For the average Group 1 customer, fixed prices recover approximately 12% of total network costs.

This Group exists to comply with the Electricity (Low Fixed Charge Tariff Option for Domestic Consumers) Regulations 2004. Any eligible residential consumer can opt to be in this group. There are approximately 200 - 300 consumers per year shifting from Group 2 to Group 1. The average annual residential consumption is also reducing and for Nelson Electricity it is now approximately 6,750 kWh per year and still reducing.

- **Load Group 2 – Connections from 15kVA – 150kVA (Non Time of Use)**

Network costs are broken down into the following:

- Capacity Supplied Price. (based on fuse capacity (in kVA))
- Variable kWh Price. This price value depends on whether the load is controlled by ripple control or uncontrolled. The controlled tariff rates are lower than the uncontrolled rate as Nelson Electricity can ensure they are turned off at peak times, reducing peak demand associated costs. The main peak time cost is the transmission, which ultimately accounts for 33.6% of the total line charge revenue. There are two controlled options:
 - a. Controlled (Hot water) – This is a key network control option to control supply to all hot water cylinders on the network. This can manage up to 10% of network load at peak demand times approximately 3MW. Typically supply is only controlled during the winter peak demand times to minimise transmission costs. Also used for other emergency load management purposes.
 - b. Night Only - This is an option for consumers that can utilise electricity in off peak times between 11pm and 7am, typically used for larger hot water cylinders and night storage heaters.

For the average Group 2 customer, capacity based charges recover approximately 49% of total network costs. All residential and business consumers are eligible from 15kVA up to 150kVA. It is designed so that the larger the fuse at the network connection point then the higher the fixed charges. The variable charges remain unchanged.

This Group has a tariff design to encourage consumers to manage their electricity use by providing an incentive to lower fused capacity. There is one current limitation with this design due to the Electricity (Low Fixed Charge Tariff Option for Domestic Consumers) Regulations 2004. The regulation ensures that for every pricing option a

residential consumer can be eligible for, there must be a pricing option they can shift to that meets the requirements of the regulations i.e fixed daily charge of no greater than 15 cents per day. To meet the regulation Nelson Electricity would require a significant increase in line pricing options by 40 (one set of four for each of the ten potential fuse size combinations). To comply with the requirements and remove the potential complexity, the residential consumers in Group 2 currently have their fused capacity set at 15kVA while non-residential have capacity based on actual fuse size.

- **Load Groups 3 – Time of Use Consumers**

These prices are designed for the larger installations on the network. These sites have Time of Use metering installed. NEL can set network prices based on the individual sites configuration and usage pattern more accurately. Network Prices are broken down into four categories.

6.6 Chargeable Capacity

The following is the typical fuse size combinations and associated capacity rating accepted at a Nelson Electricity Network Connection Point. Larger connections are on a case by case basis.

Fuse Rating Table

No. of Phases	Fuse size (Amps)	kVA Rating
3	30	15
2	40	15
3	40	28
1	60	15
2	60	30
3	60	45
1	80	20
2	80	40
3	80	60
1	100	23
2	100	46
3	100	69
3	125	87
3	150	105
3	160	110
3	200	138

The two phase 40 amp and three phase 30 amp supplies are assessed at the minimum capacity of 15kVA.

6.7 Changing Pricing Plan Limitations

Where a consumer has a choice of pricing plan the Nelson Electricity reserves the right to limit changes between pricing plans to one change in any 12 month period. E.g. Nelson Electricity offers a Low Fixed Charge plan (Group 1) to qualifying residential connections and a standard plan (Group 2) for residential connections. This condition is included in the Nelson Electricity Use of System Agreement for the purposes of managing the risk of consumers shifting principally between the regulatory imposed Group 1 Pricing and the Group 2 Pricing to take advantage of the summer/winter differences.

7. Future Changes

7.1 Background

The old electricity supply model is starting to change from the one connection to the transmission grid and the network supplying thousands of electricity users, to many sources of electricity supply with distributed generation and batteries supplying the many electricity users. This can ultimately create an “uber type” market where electricity users may be able to sell/trade excess electricity to their neighbours. The important enabler is a robust electricity network that can cater to the changing consumer requirements.

Nelson Electricity has been indicating that current network pricing needs to be reviewed given the rapid changes in the emerging technology space. The key technologies are:

- **Advanced Metering** – Provides electricity users the opportunity to make informed choices about their electricity use. The one size fits all approach with one meter reading every two months will disappear
- **The Internet of Things (IOT)** - The network of physical devices, buildings and other items—[embedded](#) with [electronics](#), [software](#), [sensors](#), and [network connectivity](#) that enables these objects to collect and exchange data.
- **Distributed Generation including Solar PV** – Providing electricity users a method of generating their own electricity.
- **Batteries** – Providing electricity users the ability to manage their electricity use through storage.
- **Electric Vehicles** – A new electrical load that can provide a lower cost means of transport.

These technologies, particularly when used together, provide electricity users the ability to manage their electricity use to their own personal advantage. Depending on their needs and pricing signals they react to, may or may not assist the network. There will also be a range of customer reliance on the electricity network from most that are 100% reliant to those who will use the network only as a backup option. Any new pricing needs to cater to both and all in between.

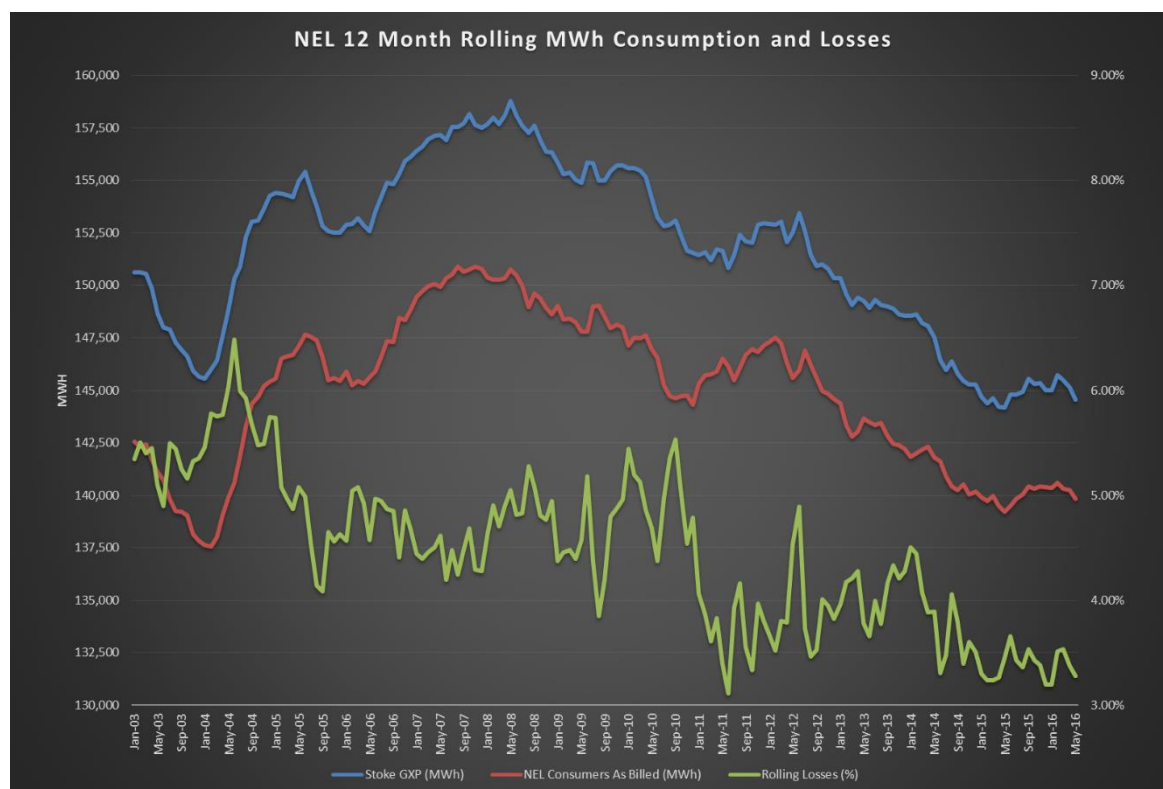
The electricity consumer will ultimately decide on the future of the electricity network as they start to take advantage of these changes. It is clear to Nelson Electricity that a new pricing methodology needs to be implemented that will stand the test of time taking into consideration these upcoming influences/changes. It will show a level of predictability/consistency to ensure that electricity users can make informed choices when deciding on investing money into any of these technologies and also how and when they utilise electricity from the network.

Nelson Electricity is mindful of the magnitude of the change and as such has invested itself heavily into the review of technologies, consumer behaviour and pricing options. This has been achieved principally through working with both shareholders and also the ENA Distribution Pricing Working Group (DPWG) as well as keeping up to date with the advances being made with the technologies.

It is critical that any new pricing needs to align with other distribution networks in NZ as much as possible. The DPWG is completing a paper on future pricing which provides some assistance in this regard. Unfortunately with such a significant change, it takes time and as a result the plan to have introduced a new pricing regime by 1 April 2017 as discussed in the 2016 Pricing Methodology has had to be delayed.

7.2 Current Consumption Trends

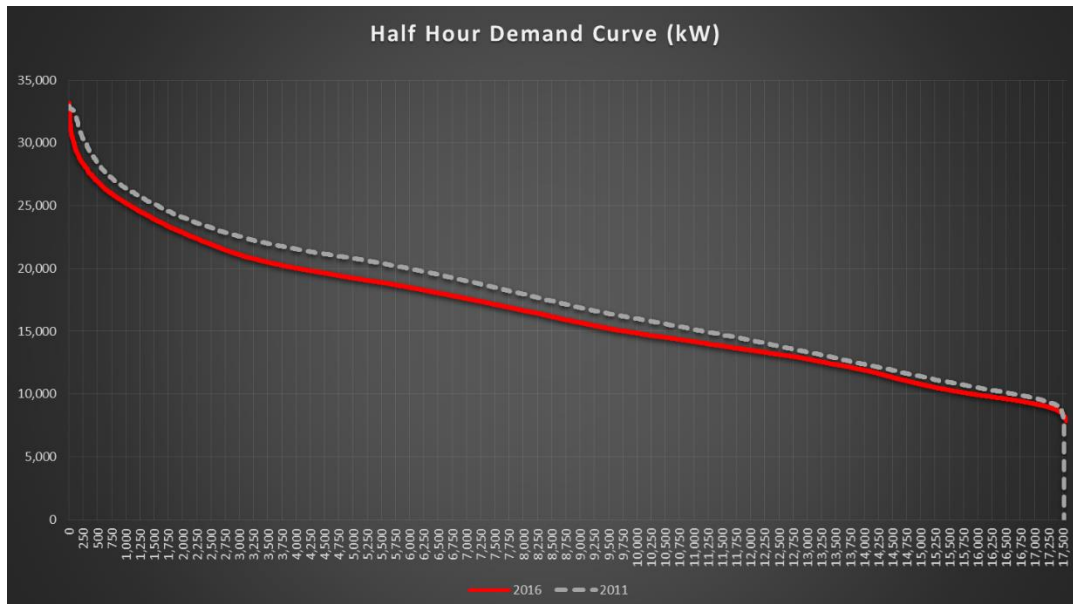
As discussed elsewhere in this document, electricity consumption on the Nelson Electricity network has been declining since 2008. Analysis of all consumer groups gives some indications as to where the changes are taking effect. There is still a slow shift of residential consumers to the low user fixed charge option (Group 1). Analysis of billing reports have shown that the average residential consumption on a per consumer basis has decreased 8.8% since 2008 to approximately 6,750kWh per consumer. Other load groups are also showing a noticeable reduction in consumption. In total it is a reduction of 10GWh or 1.0% per year for 8 years.



In 2014 a new 33kV feeder to Transpower and a new Zone Substation at Haven Road replacing the old substation on the same site was commissioned. The maximum available transmission / zone substation capacity with a security of supply level at n-1 for Nelson Electricity increased from 35MVA up to 48MVA. The new 33kV feeder was primarily to increase feeder capacity to the network from 35MVA to 48MVA and the zone substation rated at 48MVA replaced as the equipment was reaching the end of its economic life. Nelson Electricity **will have excess capacity** for the network for the foreseeable future as a result of these long term investments.

Use of load control has changed since 2014 when the new zone substation was completed. Nelson Electricity only controls load using ripple control for minimising transmission peaks to reduce the following year transmission charges. The effect is that load control is not used as frequently as in previous years, which can mean that the network peak demand can be as high as previous years.

The graph below compares the half hour demands from 2016 with 2011 from highest to lowest. This shows while the highest peaks are the same, the 2016 year is lower overall.



7.3 Issues for Future Pricing Changes

Nelson Electricity is mindful of the opportunity that in the coming couple of years advanced meters will be rolled out to most electricity consumers in the Nelson area. This means there will be the increased consumption information available for consumers and provide retailers with increasing pricing variations.

Given the Nelson Electricity network is not constrained, network pricing is more about a **fair allocation of costs** and providing electricity consumers with some certainty when they are making long term investment decisions with any of the technologies mentioned in 7.0.

Nelson Electricity has undertaken some work with regard to pricing structures and will be looking to implement changes when appropriate.

The development of a form of **service-based pricing** to ensure a fair allocation of costs will likely keep a fixed daily charge based on fuse size or capacity but shift away from simple kWh charges to a methodology that could focus on demand at critical times. The concept is to provide the electricity consumer the incentive to utilise electricity outside of peak demand times no matter whether they have access to new technology or not.

Introducing a demand component (or a targeted time of use option) while new to many will cater to the electricity consumer being able to make rational choices when investing in new technologies by providing incentives if they chose to shift electrical load out of network peak times. It has to be recognised that networks sell capacity or demand not kWh's. KWh's have been used as a proxy for demand up til now as this was the only method of measurement available with the electricity meter being read every one or two months. Advanced metering is the enabler that will provide the opportunity to make the change to include demand or targeted time of use.

There will be the complication of an increase in the number of line price options available to consumers, but this will be unavoidable. Consumers will need to be educated on the changes so they can understand the opportunities and implications.

Nelson Electricity needs to minimise any potential additional cross subsidisation or price discrimination that may occur with the two types of metering (advance metering and non-half hour) with the consumer potentially being able to opt for one or other. The ideal

situation is to make any pricing change mandatory but not likely to occur so a transition period would be necessary.

Ripple control needs to be considered in any new pricing. This has been the most effective tool for networks in managing loads. It is critical that this is retained. It is desirable that any new demand charging option excludes any load controlled by ripple control.

Nelson Electricity needs to have a billing system that can cope with the increased data requirements. A new billing system is a key limitation to introducing new pricing options.

7.4 Pricing Issues

A pricing structure and transition plan needs to be in alignment as much as possible as other Networks. Consumers have to be taken along on the journey of the change for a smooth transition.

Electricity Retailers must also be taken along on the journey and have a billing system that can cater to the change. Also desirable to have a simple network pricing structure that compliments retailer pricing and not conflict.

The network pricing structure should be relatively simple to apply and understandable for electricity consumers.

Pricing needs to incentivise continued use of load control. Load control system is a key network tool and the benefit of this needs to be preserved.

New prices need to factor in any regulatory imposed pricing factors. e.g. Electricity (Low Fixed Charge Tariff Option for Domestic Consumers) Regulations 2004. There is a need to factor in any regulatory constraints when developing pricing structures and attempt to minimise any negative impact.

Seasonal price shock. In a true cost reflective pricing structure, most of the network cost recovery should occur during the winter months. This however is not necessarily the most appropriate for consumers and a methodology should balance out the desire for consumers to have less variance on a season to season basis V's being truly cost reflective.

Individual customer price shock. Any pricing change has winners and losers. Introducing a new pricing structure is necessary to ensure there is a structure that attempts to ensure all electricity consumers pay their fair share of network related costs. This will also ensure that the network will remain viable for the Nelson City community.

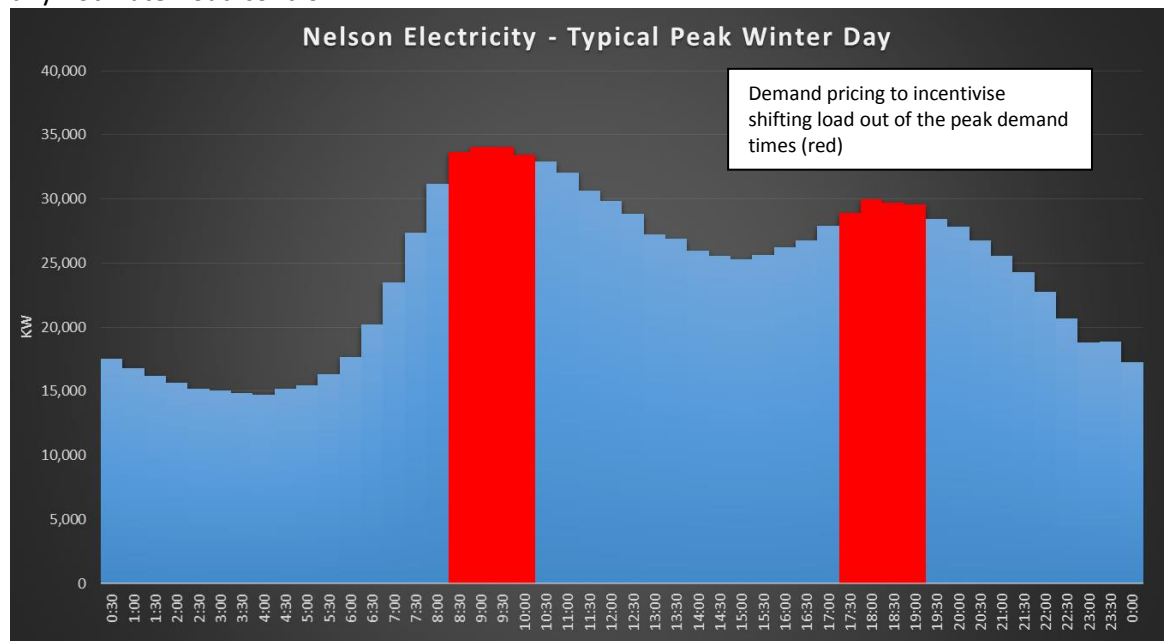
7.5 Pricing Options

Nelson Electricity has looked at a number of pricing options. The following are two viable alternatives which are currently being explored. The objective is to provide a pricing structure that will ensure that network costs are applied and recovered in a fair manner for all electricity consumers.

Option 1. Capacity and Demand

Capacity Charge - based on fuse size or capacity limiting option using advanced meter. Currently all Nelson Electricity consumers have a capacity charge based on the size of the fuses at their Network Connection Point.

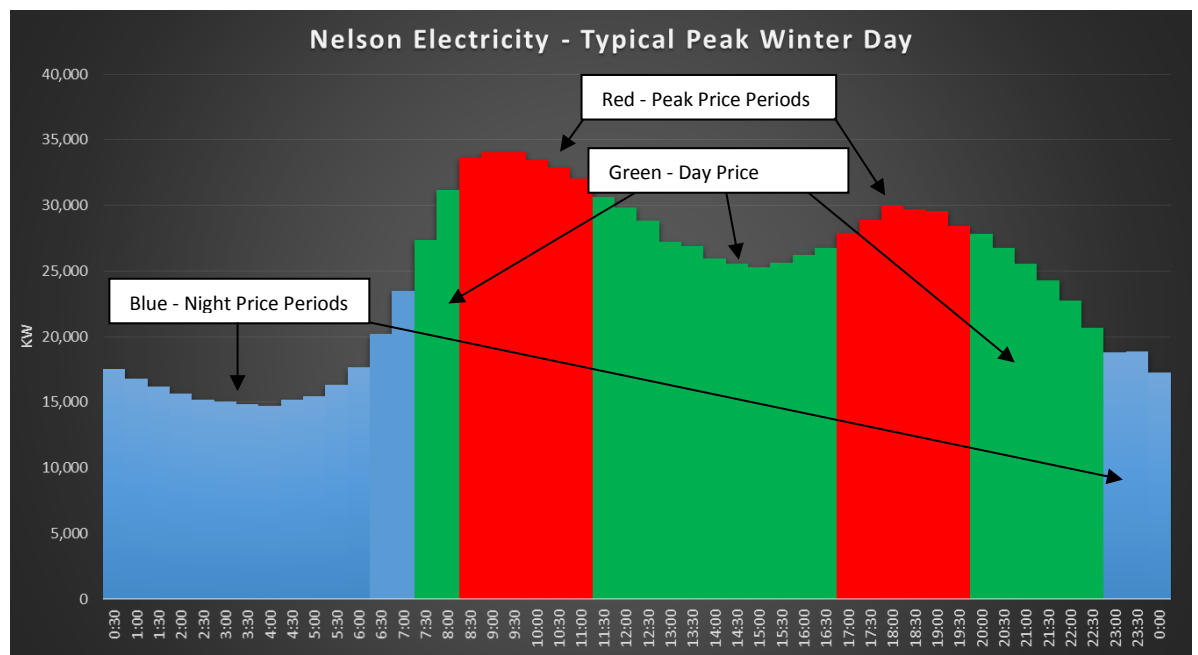
Demand Charge - Introducing a control period **demand charge** during peak demand timeframes. The time frame to be set based on the likely transmission peak pricing times (typically match Nelson network peak demand times). Peak demand excludes any hot water load control.



Option 2. Capacity and Time of Use

Capacity Charge - based on fuse size or capacity limiting option using advanced meter. Currently all Nelson Electricity consumers have a capacity charge based on the size of the fuses at their Network Connection Point.

Time of Use – Introduce time of use pricing. Have two or three pricing bands with high peak time pricing, a day time price with a low night time price. This will provide consumers with the opportunity to reduce costs by shifting consumption to different times of the day.



7.6 Future Pricing Summary

Any pricing change will now have to be implemented at 1 April 2018 at the very earliest given the limited time to consult with retailers and implement a change any earlier. The time of implementation will more likely be later to coincide with two likely key pricing influence changes, those being:

- The Default Price Quality Path reset for the period 2020 – 2025. This will apply from 1 April 2020.
- The Transmission Pricing Methodology (TPM) changes. Transmission costs account for 33% of total line charge revenue. The TPM change will mean a requirement to adjust prices.

The likely timing of a Nelson Electricity pricing methodology change is likely to be 1 April 2020. This deferment will be in alignment some other electricity networks. A clear intent will be signalled well in advance of the change to enable time to consult fully with retailers and consumers.

7.7 Future Pricing Roadmap

The Electricity Authority wrote to Nelson Electricity in October 2016 requesting that we publish our plan for introducing our new efficient line pricing. This was to be completed by 1 April 2017. A roadmap as has been requested has been included as Section 13 of this document. This outlines the estimated timelines as of February 2017 for Nelson Electricity to have introduced a new pricing regime. There are still a number of issues being worked through which may alter the anticipated introduction of 1 April 2020, some of which are outlined elsewhere in this document.

8. Non Standard Contracts

Nelson Electricity will consider offering a non-standard contract to consumers if it can be demonstrated that there is a benefit to both parties to do so. The key consideration would be if the consumer is large enough typically over 1,000kVA connected capacity and can manage peak load for the benefit of minimising any peak demand times, either transmission or network related.

The management of peak load could be through load shedding or utilisation of distributed generation.

Currently there are two non-standard contracts in place and all other consumers are charged as per the pricing schedule attached to this document. The expected revenue to be received in the upcoming year is \$347k from the two non-standard contracts.

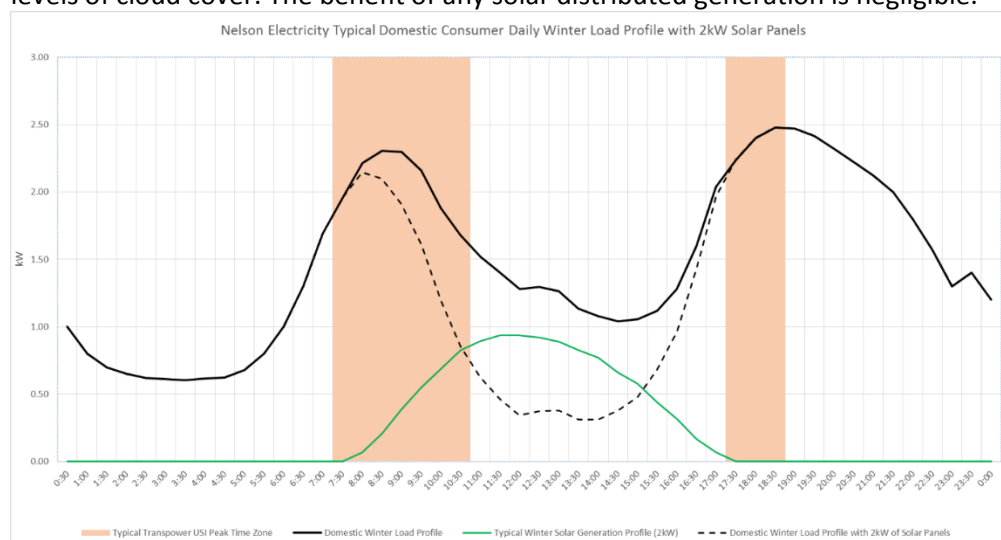
In determining a non-standard contract line charge, Nelson Electricity would determine the potential reduction in costs associated with a consumer connection if they were able to manage their load in a particular way. An example is a consumer being able to manage load in the transmission upper South Island peak demand times with greater accuracy than the current time of use pricing allows. This may result in a lowering of transmission charges for Nelson Electricity which the consumer could benefit from.

Nelson Electricity will consider any application from a consumer for a non-standard if it can be demonstrated that there is a benefit for both parties to do so, whether it be due to load management, distributed generation or bypass potential.

9. Distributed Generation

Nelson Electricity allows the connection of distributed generation to its network. There are additional requirements for these connections to satisfy Nelson Electricity that these connections are safe. The requirements are posted on the Nelson Electricity Website www.nel.co.nz.

While these connections can inject electricity back into the Nelson Electricity network the timing of this if through solar is not at a time when Nelson Electricity would benefit and assist in reducing network costs. Nelson Electricity infrastructure is designed to meet the peak capacity of the network which is on the coldest winter mornings when there is high levels of cloud cover. The benefit of any solar distributed generation is negligible.

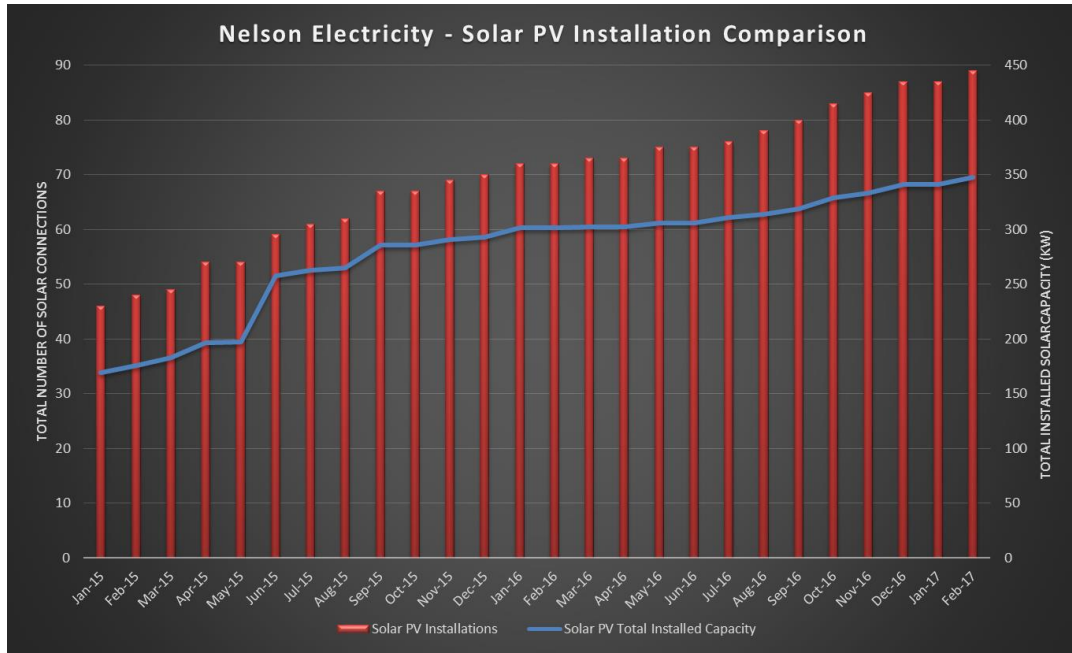


For this reason, Nelson Electricity does not offer any pricing benefit for distributed generation connections for either local line or transmission charges. Analysis of existing installations is being undertaken to ensure that any exported electricity is within the related voltage limits and of appropriate quality.

Nelson Electricity has been reviewing the costs associated with processing new distributed connections and auditing of the connections as there are additional costs associated with managing these connections to ensure they comply with appropriate standards. A new price option was created from 1 April 2014 for the exporting of kWh on to the NEL network for Groups 1 and 2. Although the level of the price is only 0.5 cents per kWh, this is designed to capture some of the safety auditing costs of distributed generation sites. As an example the annual auditing costs is approximately \$15 per year and the 0.5 cents per year will only recover \$10 per year at 2,000kWh per site.

As the installed price of distributed generation decreases, the financial viability for consumers to install increases. Nelson Electricity is mindful that connections that have Solar PV installed do not contribute fairly to their cost to supply electricity as their peak electricity usage in the middle of winter is not materially changed as per the graph above. This issue will be addressed appropriately when new pricing is introduced as per Section 7. Any electricity consumer looking to invest in distributed generation must take this into consideration.

There are currently 89 distributed generation installations on the network (as at February 2017) totalling 350kW of generating capacity. There were 17 new installations in the last 12 months. It is expected that the numbers will slowly increase as the installed price decreases.




10. Electricity Networks Association – Pricing Guidelines for Electricity Distributors 2016

The Electricity Networks Association in New Zealand in 2015 completed a Distribution Pricing Guideline and updated in 2016 for the purpose of the assisting electricity distribution businesses to describe and present their distribution prices in a consistent manner.

This Pricing Methodology as far as practical has been written to be in line with the guidelines to provide increased consistency with other networks. It is expected that over time that as the guidelines get developed further, then this pricing methodology be improved further.

11. Pricing Schedule

<div>Nelson Electricity Ltd</div> <div>Delivery Price Schedule</div> <div>From 1 April 2017</div>				<div></div> <div>NELSON ELECTRICITY LTD</div>					
Nelson Electricity Ltd is adjusting delivery prices effective 1 April 2017.									
The prices in this schedule are used to charge electricity retailers for the delivery of electricity to the central Nelson city region serviced by our electricity network. Electricity retailers determine how to allocate this cost together with energy, metering and other retail costs when setting the retail prices that appear in a customer's power account.									
Nelson Electricity delivers electricity to connections in the central Nelson city including most of the Port, Port Hills, Vanguard/St Vincent Street, Hospital, Brook, Wood and CBD areas.									
				New Delivery Prices from 1 April 2017			Existing Delivery Prices		
Price Code	Description	Consumer Numbers	Units	Distribution Price	Transmission Price	Delivery Price	Distribution Price	Transmission Price	Delivery Price
Load Group 0									
Builders Temporary (7kVA)									
0-BT	Builders Temp - Daily Price	18	\$/day	0.6190	0.0000	0.6190	0.6500	0.0000	0.6500
0-BT	Builders Temp - Uncontrolled		\$/kWh	0.06398	0.02850	0.09248	0.06600	0.03000	0.09600
Unmetered Connection (< 1kW)									
0-LM	Unmetered - Daily Price	33	\$/day	0.0590	0.0000	0.0590	0.0620	0.0000	0.0620
0-LM	Maximum Demand		\$/kW/day	0.6150	0.4940	1.1090	0.6200	0.5200	1.1400
Streetlighting									
0-SL	Streetlight	1	\$/day	224.0000	610000	285.0000	232.0000	64.0000	296.0000
Load Group 1									
Residential Low User (15kVA)									
1-Fixed	Capacity Supplied	3707	\$/kVA/day	0.0100	0.0000	0.0100	0.0100	0.0000	0.0100
1-24hr	Uncontrolled		\$/kWh	0.06398	0.02850	0.09248	0.06600	0.03000	0.09600
1-Water	Controlled (Hot Water)		\$/kWh	0.03872	0.01615	0.05487	0.04000	0.01700	0.05700
1-Night	Night Only (11pm-7am)		\$/kWh	0.02418	0.00950	0.03368	0.02500	0.01000	0.03500
1-DG	Distributed Generation		\$/kWh	0.00500	0.00000	0.00500	0.00500	0.00000	0.00500
Load Group 2 (from 15kVA to 150kVA)									
Residential and Business									
2-Fixed	Capacity Supplied	5388	\$/kVA/day	0.0646	0.0000	0.0646	0.0646	0.0000	0.0646
2-24hr	Uncontrolled		\$/kWh	0.01915	0.02850	0.04765	0.02100	0.03000	0.05100
2-Water	Controlled (Hot Water)		\$/kWh	0.01264	0.01615	0.02879	0.01400	0.01700	0.03100
2-Night	Night Only (11pm-7am)		\$/kWh	0.00979	0.00950	0.01929	0.01000	0.01000	0.02100
2-DG	Distributed Generation		\$/kWh	0.00500	0.00000	0.00500	0.00500	0.00000	0.00500
Load Group 3 LARGE COMMERCIAL (up to 2400kVA)									
TIME OF USE									
	Metered Installation	92	\$/day	1.1900	0.0000	1.1900	1.2500	0.0000	1.2500
	Winter Demand (kVA)		\$/kVA/day	0.12673	0.09690	0.22363	0.1280	0.1020	0.2300
	Energy - Uncontrolled		\$/kWh	0.00257	0.01330	0.01587	0.0020	0.0140	0.0160
	Capacity Supplied								
T-03	15kVA - 42kVA		\$/day	2.0760	0.0000	2.0760	2.1800	0.0000	2.1800
T-04	43kVA - 69kVA		\$/day	3.4180	0.0000	3.4180	3.5900	0.0000	3.5900
T-05	70kVA - 110kVA		\$/day	5.4470	0.0000	5.4470	5.7200	0.0000	5.7200
T-06	111kVA - 138kVA		\$/day	6.8330	0.0000	6.8330	7.1800	0.0000	7.1800
T-07	139kVA - 218kVA		\$/day	10.7940	0.0000	10.7940	11.3400	0.0000	11.3400
T-08	219kVA - 300kVA		\$/day	14.8550	0.0000	14.8550	15.6000	0.0000	15.6000
T-09	301kVA - 500kVA		\$/day	24.7580	0.0000	24.7580	26.0000	0.0000	26.0000
T-10	501kVA - 750kVA		\$/day	37.1360	0.0000	37.1360	39.0000	0.0000	39.0000
T-11	751kVA - 1000kVA		\$/day	49.5150	0.0000	49.5150	52.0000	0.0000	52.0000
T-12	1001kVA - 1500kVA		\$/day	74.2730	0.0000	74.2730	78.0000	0.0000	78.0000
T-13	1501kVA - 2000kVA		\$/day	99.0300	0.0000	99.0300	104.0000	0.0000	104.0000
T-15	2001kVA - 2400kVA		\$/day	118.8360	0.0000	118.8360	124.8000	0.0000	124.8000
	Power Factor <0.95		\$/kVA/mth	6.5000	0.0000	6.5000	6.5000	0.0000	6.5000
All prices exclude GST. All prices are also available from our website www.nel.co.nz .									
Pricing Methodology - Full details on how prices are applied are included in our Pricing Methodology which is available from our website.									
Load Group 0 - Unmetered loads that meet Electricity Authority Unmetered Load Guidelines and Builders Temps. (Builders Temp > 7kVA use Load Group 2)									
Load Group 1 - Residential households (principal place of residence only) with connection capacity of 15kVA using less than 8,000kWh per year as required to comply with the Electricity (Low Fixed Charge Tariff Option for Domestic Consumers) Regulations 2004									
Load Group 2 - Available to all residential and business connections with capacity from 15kVA to 150kVA.									
Load Group 1 & 2 - All current residential households have an assessed connection capacity of 15kVA.									
Load Group 1 & 2 - Distributed Generation charge is for electricity exported into the Nelson Electricity network.									
Load Group 3 - Available to any Time of Use connections up to 2400kVA									
Load Group 1, 2 & 3 - Nelson Electricity Ltd reserves the right to limit changes between Load Groups to one change in any 12 month period.									
Any questions about the delivery prices, please email us at enquiry@nel.co.nz or phone (03)546-0486.									

12. Price / Quantity / Revenue Schedule

Revenue Table using 31 March 2018 Prices and 2017/2018 Quantities

Number of Days:	365									
Tariff or Fee	Number of ICPs at 31/03/2018	kWh at 31/3/2018	kVA at 31/3/2018	Distribution Charges			Variable (c/kWh)	Notional Distribution Revenue		Total Revenue (\$)
				Fixed		Other		Fixed	Variable	
				\$/day	c/kVA/day					P ₂₀₁₈
Group 0										
Streetlights	1	1,079,577		284.769				103,941		103,941
Unmetered Fixed	33			0.059				711		711
Unmetered Capacity			3.099		110.901			1,254		1,254
Builders Temp	18			0.619				4,067		4,067
BT-kWh		19,072					9.248	-	1,764	1,764
								109,973 98%	1,764 2%	111,736
Group 1										
Fixed	3707		52,232		1.000			190,647		190,647
Anytime		12,387,335					9.248	-	1,145,580	1,145,580
Controlled		5,686,542					5.487	-	312,027	312,027
Nightrate		465,281					3.368	-	15,670	15,670
DG		109,013					0.500	-	545	545
								190,647 11%	1,473,822 89%	1,664,469
Group 2				0.000	0.000	0.000	0.000			
Fixed	5388		113,412		6.460			2,674,142		2,674,142
Anytime		51,666,966					4.765	-	2,462,101	2,462,101
Controlled		9,579,789					2.879	-	275,797	275,797
Nightrate		1,018,686					1.929	-	19,654	19,654
DG		195,480					0.500	-	977	977
								2,674,142 49%	2,758,530 51%	5,432,671
Group 3 - Time of Use				0.000	0.000	0.000	0.000			
Metered Installation Charge	89			1.190				38,658		38,658
Energy		33,499,618					1.587	-	531,680	531,680
Winter Demand			10,581		22.363			863,657		863,657
Capacity Supply Group 3	2			2.076				1,515		1,515
Capacity Supply Group 4	1			3.418				1,248		1,248
Capacity Supply Group 5	10			5.447				19,880		19,880
Capacity Supply Group 6	9			6.833				22,446		22,446
Capacity Supply Group 7	31			10.794				122,138		122,138
Capacity Supply Group 8	13			14.855				70,485		70,485
Capacity Supply Group 9	14			24.758				126,511		126,511
Capacity Supply Group 10	6			37.136				81,329		81,329
Capacity Supply Group 11	3			49.515				54,219		54,219
Capacity Supply Group 12	0			74.273				-		-
Capacity Supply Group 13	0			99.030				-		-
Capacity Supply Group 15	0			118.836				-		-
Power Factor			579			78.000		45,197		45,197
DG							0.500			
Group 3 - Non-Standard				0.000	0.000	0.000	0.000			
Energy		9,564,967					0.191	-	18,233	18,233
Installation	2			1.191				869		869
Winter Demand			1,834		12.673			84,832		84,832
Capacity Supplied			3,900		4.951			70,484		70,484
Power Factor			93			78.000		7,244		7,244
Transpower Cold Storage						43,656.004		43,656		43,656
Transpower NMDHB						122,332.817		122,333		122,333
DG							0.500	-	-	-
								1,776,701 76%	549,914 24%	2,326,615
Group 4				0.000	0.000	0.000	0.000			
Fixed	1	13,503,478				489,402.270		489,402		489,402
Power Factor			-			78.000		-		-
								489,402 100%	- 0%	489,402
Σ P ₂₀₁₈ Q ₂₀₁₈	9226	137,533,200						5,240,864 52%	4,784,029 48%	10,024,893

13. Future Pricing Roadmap Table

Future Pricing Roadmap Checklist																		EDB : Nelson Electricity Limited									
Roadmap Stages				Activities	Timeline												Resource requirements										
					2017 Q1	2017 Q2	2017 Q3	2017 Q4	2018 H1	2018 H2	2019 H1	2019 H2	2020	2021	2022	2023	2024	2025									
1. Initiate pricing reform																											
Problem identification & Discovery				Justification and early modelling	X														NEL								
Define overall objectives for reform				Set overall goals including target dates or date ranges	X														NEL / ENA / Shareholders								
Develop strategy to deliver reform				Develop ideas on how to go ahead (including long list of future pricing options if available)	X														NEL / ENA / Shareholders								
Communicate				Prepare and publish future pricing roadmap. Include reasoning and why it's important	X														NEL								
Identify challenges				eg. resourcing implications, billing systems, BEP1 file formats, AMI penetration and technology.	X														NEL - New Billing System								
Consult retailers				Socialise ideas & plans with retailers		X													NEL / ENA								
Establish high level plan				Gain commitment to reform, agree plan, allocate resources		X													NEL								
Gather basic data for analytics				What do we need to know to progress reform? (eg. AMI penetration? Survey customers?)			X												NEL / ENA / Shareholders								
Define pathway				Prepare final strategic pricing plan (including target dates)			X												NEL / ENA / Shareholders								
Alignment across EDBs				Compare plan with other EDB's, form coalitions				X											NEL / ENA / Shareholders								
2. Plan changes in more detail																											
Develop detailed plans, including:				Identify issues/prepare detailed pricing reform plans					X										NEL / ENA / Shareholders								
- customer interactions				Establish research program and focus groups (retailer + end-user)					X										NEL / ENA / Shareholders								
- pricing trials to test ideas				Conduct in-market testing, examine impact on customer groups					X										NEL / ENA / Shareholders								
- data analysis to assess customer impacts				Narrow down preferred options and test market impacts					X										NEL / ENA / Shareholders								
- implementation and transition arrangements				Identify what will drive success					X										NEL / ENA / Shareholders								
- feedback loops and issues resolution				Develop processes to account for stakeholder views and review against target dates. Participate in ENA					X										NEL / ENA / Shareholders								
- communication				Educate customers and retailers about change					X										NEL / ENA / Shareholders								
- regulatory compliance				Check plan meets regulatory expectations					X										NEL / ENA / Shareholders								
3. Manage roll out of new pricing options																											
Develop transition strategies				Incentivise and manage take-up over time for retailers and customers						X									NEL / ENA / Shareholders								
Adopt risk management approach				Identify and manage risks to markets, customers, EDBs (eg political and financial risks)												X			NEL / ENA / Shareholders								
Implement New Pricing				Introduce the new pricing options										X					NEL								
Review progress and make adjustments				Actively consider progress towards outcomes over time														X	NEL								
Ongoing customer interactions				Monitor customer responses and manage as required															NEL								

14. Loss Factors to Apply for the Period 1 April 2017 – 31 March 2018

Loss Factors will remain unchanged for the year.

Loss Code	Description	Loss Factor Consumption	Loss Factor Generation
L0	Group 0 Unmetered and Builders Temporary Supply	1.044	1.019
L1	Group 1 Residential (Low Fixed Charge Option)	1.044	1.019
L2	Group 2 Residential and Business	1.044	1.019
L3	Group 3 Large Commercial - Supplied from 400V Network	1.033	1.022
L4	Group 4 Large Commercial - Direct 400V feed from transformer	1.033	1.022
L5	Group 5 Large Commercial - Dedicated Transformer 400V Metering	1.033	1.022
L6	Group 6 Large Commercial - Dedicated Transformer 11kV Metering	1.027	1.017