Nelson Electricity Limited
Pricing Methodology Disclosure

For the period beginning 1 April 2022

Updated 28 April 2022
Replacing Nelson Electricity Limited
Pricing Methodology Disclosure dated 31 March 2021

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

<u>Nelson Electricity Limited - Pricing Methodology for the period beginning 1 April 2022</u>

SCHEDULE 17
Certification of Year-beginning Disclosures

Clause 2.9.1

We, Tim Cosgrove.......... and Oliver Kearney.... 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 28 April 2022

Signed

Date 28 April 2022

Glossary and Abbreviations

Advanced Meter	Also called a smart meter. Is 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 1 or 2 metering installation point (≤500Amps).
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.
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'.
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.
Electricity Networks Association (ENA)	Association of all 29 New Zealand electricity distributors.
Information Disclosure (ID)	Electricity Distribution Information Disclosure Determination 2012.
Input Methodology (IM)	Electricity Distribution Services Input Methodologies Determination 2012.
Installation Control Point (ICP)	See Connection.
Kilowatt hour (kWh)	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 (≤500Amps).
Low Fixed Charge Regulations (LFC Regulations)	Electricity (Low Fixed Charge Tariff Option for Domestic Consumers) Regulations 2004.
Loss Factor	Loss factors are declared by distributors and used to reflect the normal difference between energy injected into a network and energy delivered from the network in the reconciliation process.
Low Fixed Charge (LFC)	Low Fixed Charge.
Lower South region	Stipulated in the LFC regulations as consumers supplied by the Arthur's Pass, Castle Hill, Papanui, and Hororata grid exit points, or any grid exit point that is located further south.
Meter Categories (1, 2, 3, 4, and 5)	Defined in the Schedule 10.1 of the Code. See Appendix 6.
Meter register	An energy measurement device on a meter.
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.
Registry	The registry is a national database that contains information on every point of connection on local and embedded networks to which a consumer or embedded generator is connected.
ToU Meter	Category 3, 4, or 5 metering installation capable of recording kWh and at least one of kVArh and kVAh on a half-hourly basis
Transmission	Conveyance of electricity at high voltages through the Transmission network.
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.
Unaccounted for Energy (UFE)	The difference between reported energy injected into a network and the reported energy extracted from the network after it has been adjusted using Loss Factors.

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

1. Introduction

Background

Nelson Electricity Limited is the Electricity Distribution Business 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.

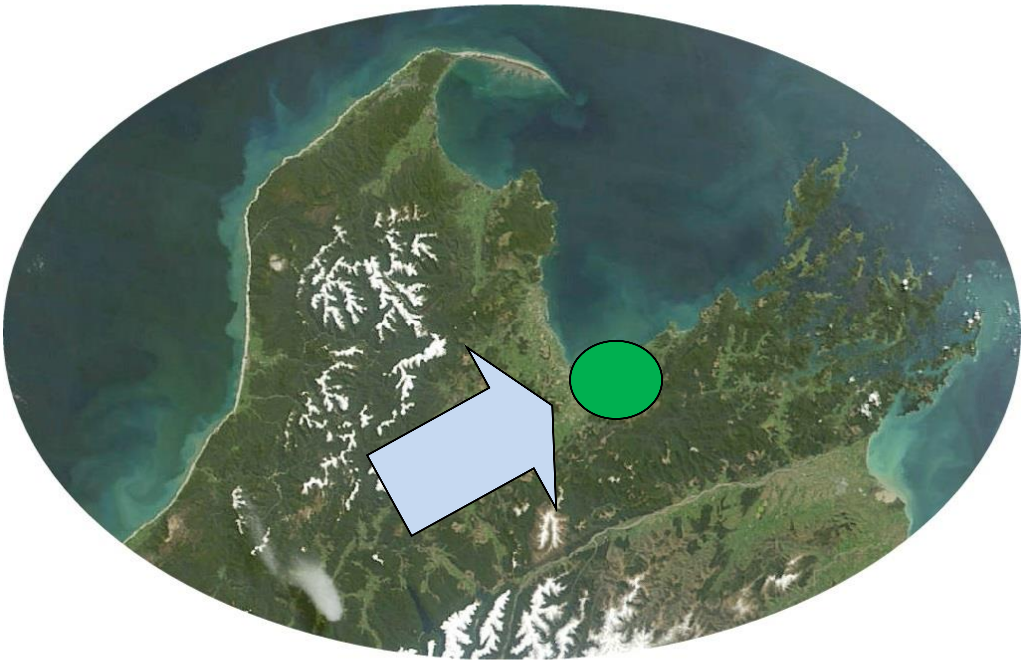


Figure 1 Nelson Electricity is in Nelson city at the top of the South Island.

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 9,300 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 35MVA, during winter months and distributes 137GWh annually through the network.

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

kWh Consumption

Nelson Electricity, from the 1950s up until 2008, had consistent kWh growth of approximately 1.0% - 1.5% per year.

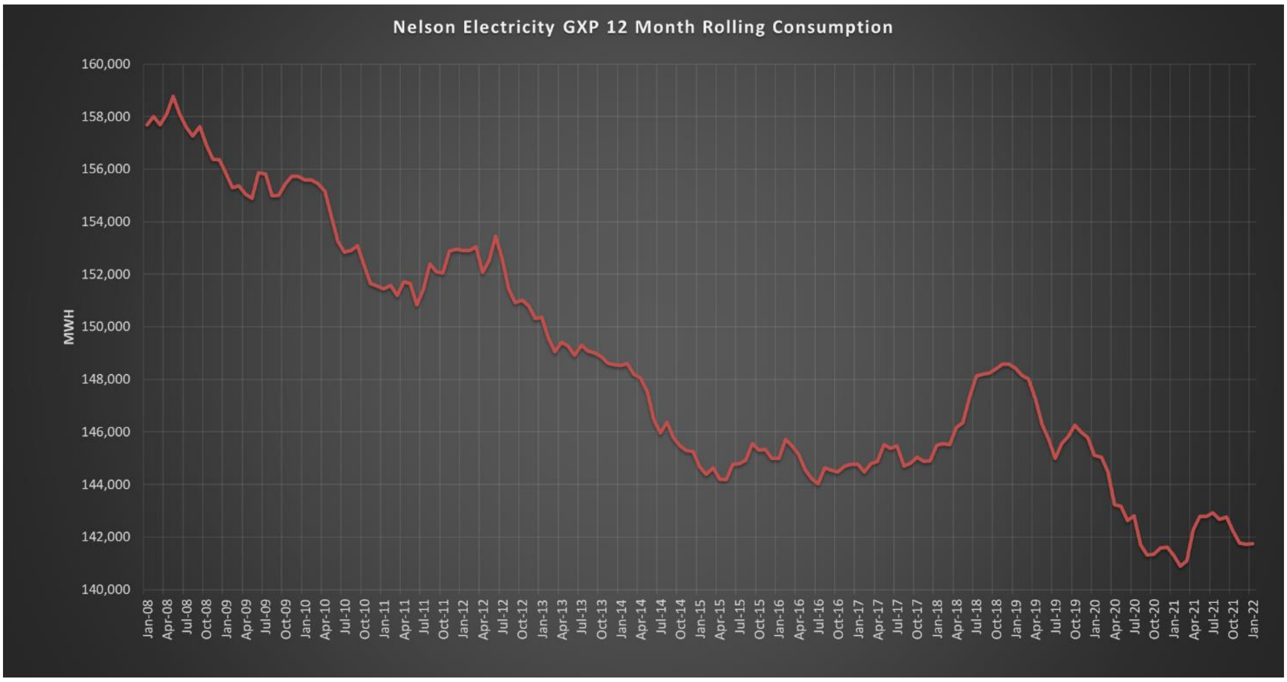
Between 2008 and 2015 kWh consumption then reduced at approximately 1.0% per year. The global financial crisis may have started the decline in consumption in 2008 but the decline continued due to the following changes at consumer level:

- Older appliances being replaced with more energy efficient options
- LED lighting replacing incandescent and compact fluorescent light bulbs
- Improvements in home insulation
- Greater energy conservation by electricity consumers
- Higher electricity prices
- Installation of solar PV.

Consumption flattened off between 2015 through 2017 and then and increase in 2018 with a colder winter and hot summer, then returned to normal levels in 2019.

Covid-19 and some larger customer changes impacted the network in 2020 with consumption reducing 3% through the year. Most of the Covid related impact was during the Alert Level 4 and 3 lockdowns in April 2020 and May 2020. Consumption on a month-to-month basis since then (excluding the larger customer changes) has returned to previous year levels.

With the information Nelson Electricity has on hand and excluding significant Covid-19 impacts on the region for the first half of 2022, it is assessed that the short to medium term (1–5 years) outlook for Nelson Electricity is flat consumption. Electricity consumption is forecast to then begin increasing in the medium term (5-10 years) at 1% per year as electric vehicles become more cost effective and EV charging options become more prevalent on the network whether they be public or private. This increase in consumption will more than offset the increase of kWh being generated and used behind the meter through solar PV installations.

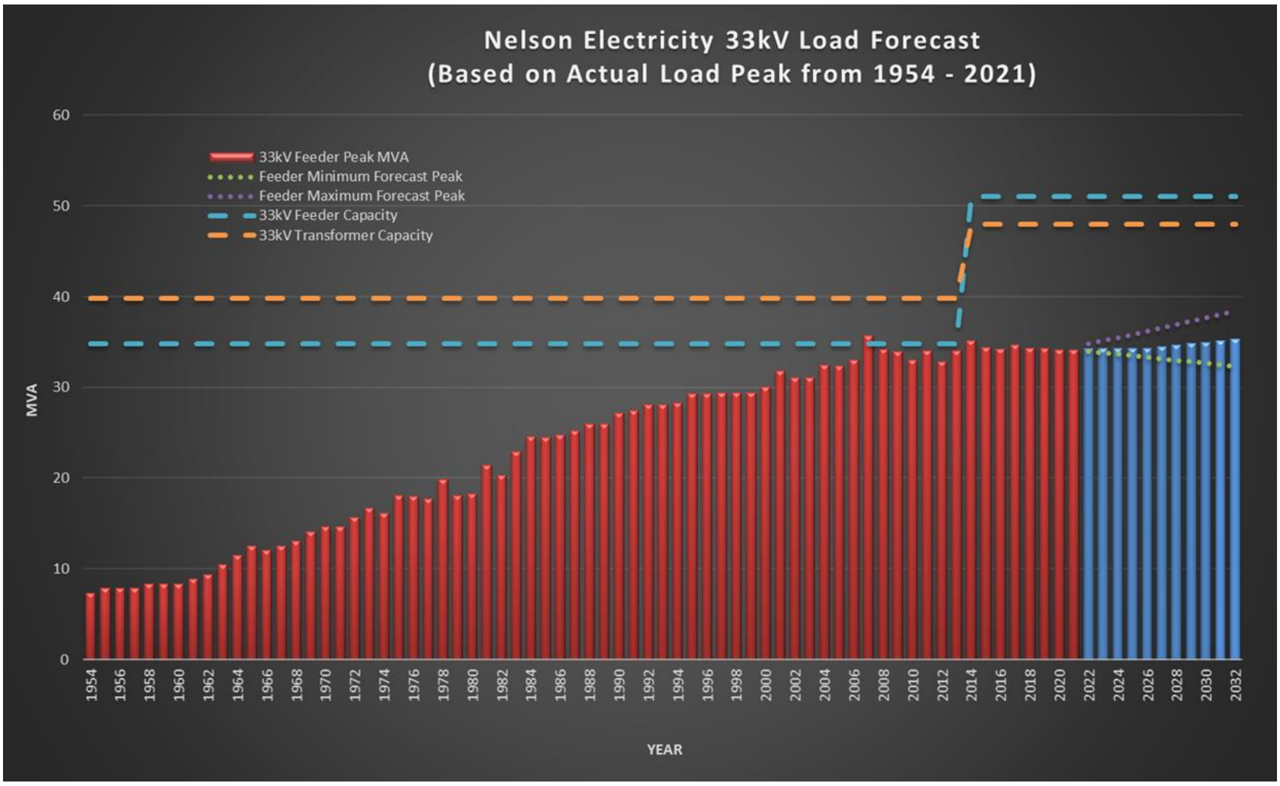


Peak Demand

Peak demand up until 2008 was also increasing at the same rate as kWh's at approximately 1.0% - 1.5% but since 2008 has flattened off but not decreased. This peak demand level has remained unchanged. The reason for peak demand growth has not tracked downward with 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.

There is limited opportunity for new load/connections as there is limited undeveloped land available in the central Nelson city area. Many recent re-developments of land typically have resulted in no additional growth given any new building uses less electricity overall.

The following graph demonstrates how the peak demand has flattened since 2008.



With the information Nelson Electricity has on hand, it is assessed that the short to medium term (1-5 years) outlook for Nelson Electricity is no change to peak demand with 0% growth. Depending on the number and behaviour of EV charging, peak demand could start to increase by up to 1% per year thereafter.

Connection Numbers

Connection number changes are calculated as being the difference between decommissioned and new connections. Between 2010 and 2015 Nelson Electricity has had on average 50 new ICPs a year. Most are typically new residential connections.

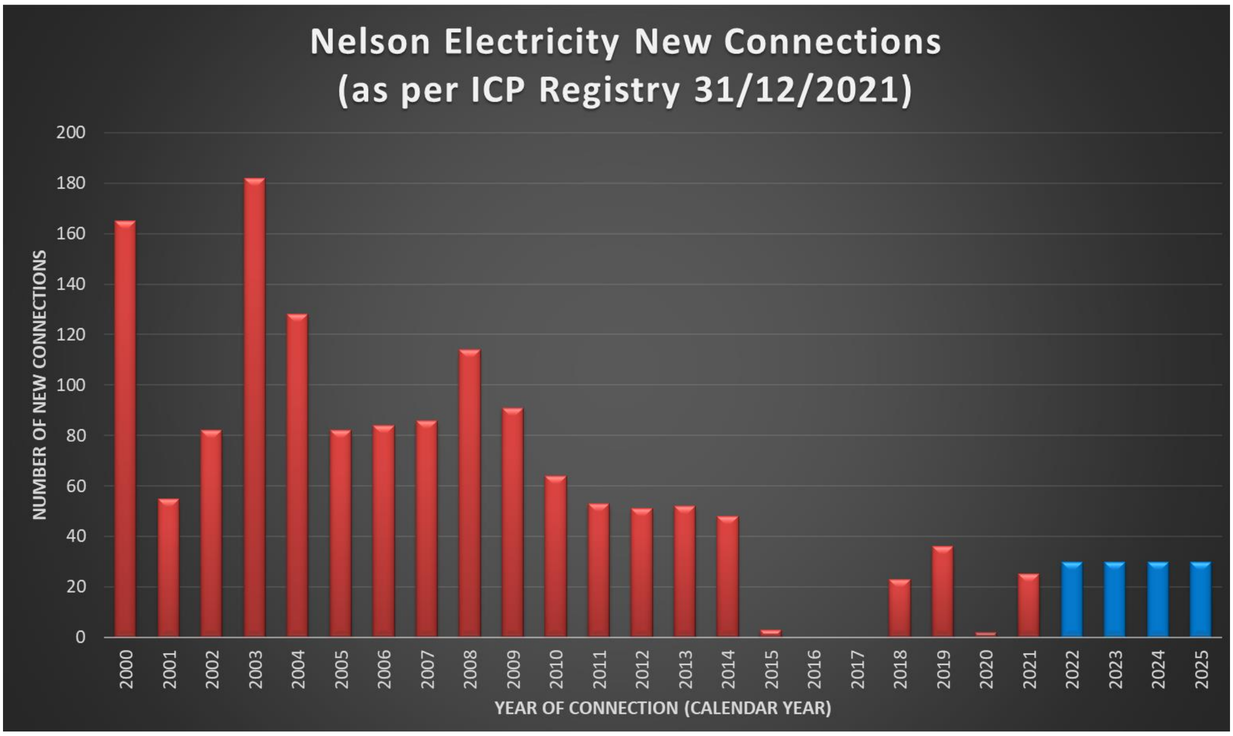
Since 2015 decommissioned ICPs have offset the new ICPs which has meant that connection numbers have been flat for almost three years. This is, however, not an indication of no growth as many decommissioned sites are making way for new future connections and the applications are now coming through with many starting to be realised.

There are several small building and subdivision developments progressing around the city which brough in 30 new connections in 2020. Our pricing will factor in 30 new ICPs for the coming year as well.

Nelson City Council has also released their Intensification Action Plan in 2021 which looks at a guiding framework for Council actions to enable housing intensification in the area with a clear change to intensifying housing development in the central Nelson City area. While the impacts of this plan will take time to deliver intensification results, there will clearly be a change in the number of connections and consumption may begin in the medium to long term (5 years plus).

The numbers of new connections for 2022-2023 may increase beyond 30, but this report takes a conservative approach.

Some large commercial consumers are still looking at their costs and, as such, there may be some capacity downsizing requested which could impact on revenue as changes are made.



Technology – Times are Changing
On top of the flat consumption forecast, there is an increased uncertainty as to the effect certain technologies and industry evolution will have on the role the electricity network will play in the future. Nelson Electricity recognises its place as the key infrastructure that supports the Nelson region's 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 starting to dictate the network's 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 reliance of consumers sourcing all electricity from the distribution network and transmission system is slowly reducing. With distributed generation already being installed and the likely introduction of home scale batteries in years to come, this creates the opportunity for new electricity retail offerings to benefit these consumers including time of use pricing and peer to peer trading. Nelson Electricity must 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 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 can make rational choices when investing in any new technologies.

The current regulatory environment around pricing limits Nelson Electricity's ability to introduce an effective pricing structure that is fair to all consumers. Currently, those consumers who can afford to invest in distributed generation and batteries and other things are not paying their fair share of network related costs. These costs are being subsidised by consumers that currently do not or cannot afford to invest in these technologies. A new cost-reflective pricing structure is being considered for introduction on 1 April 2023. This target date has been pushed out from previous years and is discussed in Section 8.

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 must comply with the Electricity Distribution Services Default Price-Quality Path Determination 2020 (DPP) administered by the Commerce Commission. Nelson Electricity must also 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 must comply with the Electricity Distribution Services Default Price-Quality Path Determination 2020 (DPP). The Commerce Commission resets the Price-Quality Path every five years. The 2022-2023 year is the third of the current five-year path from 1 April 2020 – 31 March 2025.

Default Price Path Compliance Summary
Nelson Electricity, for the year ending 31 March 2023, will comply with the Default Price-Quality Path (DPP) revenue requirements. The Nelson Electricity Forecast Revenue which is based on 2022-2023 prices multiplied by forecasted 2022-2023 quantities will be less than the Forecast Allowable Notional Revenue.

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.

3. Pricing Principles

3.1 Electricity Authority Distribution Pricing Principles

The Electricity Authority's pricing principles are as follows:

(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);

Standalone Cost
Nelson Electricity is a dense urban network with no other reticulated energy options. The cost to either go off grid or bypass the network is too high for all Load Groups except for our one consumer in Load Group 4 of which bypass is possible due to proximity to our neighbouring network. Special pricing has been in place reflecting this for the Load Group 4 consumer for over 25 years.

The opportunity for consumers in Load Groups 1, 2 and 3 to go off grid is through use of distributed generation or changing to other sources of energy. The overall cost of these options (including upfront and ongoing costs) is materially higher than the cost of receiving supply from the Nelson Electricity network.

The number of solar panels required to go off grid has a cost and real estate implication. The quantity if complimented by batteries would have to be based on the peak consumption days, which is in wintertime. Most consumers will not have enough roof space to satisfy the kW requirements to be standalone. Consent issues with using wind and other natural resources is also an issue in a dense urban environment, so this is only a real possibility for a very small number of consumers on the fringes of the network. . The only other alternative is changing or complementing distributed generation with batteries and another energy source, but there are limited options for competing fuels in Nelson city. Nelson has bottled LPG available, which could only satisfy the heating requirements. With the decarbonisation of energy use in New Zealand in the coming years, LPG will become less viable leaving it's likely replacement hydrogen if and when this gas becomes viable and available.

Nelson Electricity will keep an eye on the standalone costs for each Load Group as the price of solar panels and home scale batteries reduces.

Avoidable Costs
Avoidable costs are those that can be avoided by not supplying a consumer or group of consumers. This can include the costs of billing and consumer service costs, connection costs specific to the consumer or consumer group and additional maintenance costs. Given Nelson Electricity is primarily a fixed cost business, the incremental effect on costs of a consumer or group of consumers disconnecting from the network is low except for transmission costs which represent approximately 30% of a typical consumers proportion of network costs. The current annual estimates of avoidable costs on a per consumer basis is:

Load Group 1 $133 per consumer compared to average revenue of $428.
Load Group 2 $347 per consumer compared to average revenue of $956.
Load Group 3 $8,718 per consumer compared to average revenue of $20,264.

(ii) reflecting the impacts of network use on economic costs;

The network is currently not constrained from sub-transmission down to the 11kV network level. A study was recently undertaken to determine any potential constraints at the low voltage network level because of electric vehicle charging, battery storage and solar PV. The results showed there were no immediate constraints. **There are areas in the low voltage network that may be susceptible should the numbers of electric car chargers increase at a faster rate than forecast** (this could be an overall increase or specific areas or pockets). Nelson Electricity's pricing needs to ensure the relevance of load control for this medium-term eventuality to eliminate the congestion or defer the need for network upgrades.

Network costs are predominantly stable with a relatively smooth capital and operational expenditure profile for the next 10 years (excluding the recent inflationary and service provider changes in costs). These network costs are mostly not location specific thus requiring multiple pricing areas.

There is one area on the network where a separate pricing area will likely be introduced in 2023 where the economic cost for Nelson Electricity is significantly greater than the revenue received. The Fringed Hill area supplying four commercial consumers has a two kilometre rural distribution line that is subject to additional costs compared to the rest of the network. Those being annual tree management, access corridor clearing, line maintenance and additional insurance. The true economic cost of providing line function services to the four consumers is greater than 400% - more than the current revenue received through standard pricing. Currently these consumers are on standard pricing. Any increase in prices will be fixed in nature given the additional costs are not load dependant.

The Nelson Electricity pricing regime has adapted over time with the gradual increase in revenue received through fixed charges. In 2015 fixed charges represented 52% of revenue and in 2022 fixed charges will represent 59% of revenue. The true economic cost recovery should be a significantly higher proportion of revenue from fixed charges than the current levels due to there being no significant constraints on the network. **Any new pricing regime will reflect this transition to a higher proportion of fixed prices.**

The Nelson Electricity delivery prices will be based on there being no constraints at any level in the short term (1–5 years) with demand management becoming more relevant as load increases in some areas of the low voltage network as the number of electric vehicles increase in the medium term (5–10 years).

The current pricing reflects different network service offerings that account for price and quality trade-offs, asset usage requirements, and consumption preferences that have evolved over time. Key examples of consumer service preferences that are catered for in our pricing are also discussed:

- **Connection Capacity**
  Nelson Electricity sees connection capacity as being the key pricing component. Every consumer can increase or decrease the connection capacity to suit their individual requirements. Current residential consumers have their connection capacity assessed at a standard residential fuse size of 15kVA to reduce the complexity of our pricing due to the inefficient impacts of the Low Fixed Charge regulations. **Business consumers can increase and decrease connection capacity to reflect their changing needs**. Nelson Electricity does not charge a consumer for any decrease but will charge actual costs for any increase in capacity. Increases are subject to network capacity availability.

- **Controllable Load**
  Nelson Electricity pricing allows for controllable load options typically used for hot water and winter heating for Load Groups 1 and 2, and winter control period demand for Load Group 3 consumers. Pricing for controllable loads for Load Groups 1 and 2 is on a per kWh basis so consumers get the direct benefit of the cost differential between uncontrolled and controlled prices. Load Group 3 consumers have access to a load control channel for the winter control period demand. They can opt for any of the business load to be controlled through that winter period. The benefit to the consumer is a lower Winter Demand, which reduces the charges that are applied the following year.

- **Power Factor Charge**
  To encourage power factor management, a power factor charge is applied to Group 3 and 4 consumers who have a monthly peak demand below a power factor of 0.95. This signals to the consumer the need to manage power factor to optimise network capacity and quality of supply.

- **Non-Standard Arrangements**
  Large business consumers who have differing needs can enter into a non-standard agreement with us. There are currently two consumers with Dedicated Connection Contracts that allow them to better manage their transmission costs.

Nelson Electricity is looking to introduce Time of Use Pricing or something similar for Load Groups 1 and 2 that will complement the existing capacity charges. These are being considered for introduction on 1 April 2023. A new pricing regime will provide consumers incentives to utilise electricity outside of peak demand times in advance of and to reduce the medium term forecasted low voltage network constraints.

(ii) reflecting differences in network service provided to (or by) consumers; and

Pricing is primarily centred around capacity (the maximum demand a consumer can draw from the network at any point in time). Nelson Electricity also uses load control to shift load out of times that can incur additional cost (transmission costs) or manage demand in an emergency or times of a constraint on the network. The price options available provide for some flexibility on the utilisation of both key options. Consumers can change options as and when they assess there is value.

(iii) encouraging efficient network alternatives.

Network pricing should be encouraging efficient investments in alternatives to transmission or distribution network supply. Current network alternatives include distributed generation, battery storage, interruptible demand, and demand management. **Nelson Electricity will be looking at introducing Time of Use pricing or something similar for Load Groups 1 and 2 and steadily increase the proportion of fixed prices which will assist in providing stable long term pricing structure and the assurance for consumers to invest in efficient network alternatives.**

(b) Where prices that signal economic costs would under-recover target revenues, the shortfall should be made up by prices that least distort network use.

Nelson Electricity is considering introducing new pricing options in 2023 that will better signal economic costs. We are working through new pricing options with the knowledge that the network is currently not constrained in the short term (1–5 years). **The medium to longer term (5 years plus) will most likely see an increase in consumption and demand with the increase of electric vehicles as well as the decarbonisation of energy, which will see a transition from fossil fuels to electricity over the next 25-30 years. This will start to put pressure on the low voltage network resulting in the increasing need to utilise load control for network purposes.**

The current pricing regime has been moving more towards cost-reflective pricing with improved cost allocations between variable pricing options and the increasing of fixed charges to recover the shortfall. A new cost-reflective pricing structure is being considered for introduction on 1 April 2023. This will accelerate the transition to ensure consumers can respond/consider the true economic signals Nelson Electricity requires to maintain an efficient network.

If Nelson Electricity were to set prices according to the economic cost of the current environment of no network constraints, the proportion of revenue received from variable costs would reduce from 41% to approximately 10% - 20%. There would also be the lessoning of the variable pricing differential between uncontrolled and controlled in the short term. Pricing in the medium to long term, due to upcoming low voltage network constraints, would result in the increase again of total revenue from variable charges and increased differential of controlled/uncontrolled or peak/off peak prices.

(c) Prices should be responsive to the requirements and circumstances of end users by allowing negotiation to:

(i) reflect the economic value of services; and

As noted above, prices above stand-alone cost could not be sustained in a competitive market and may result in inefficient bypass of the existing infrastructure. As prices are significantly below the stand-alone costs, bypassing the network is discouraged suggesting that the prices reflect the economic value of services. However, Nelson Electricity is open to entering into non-standard arrangements for large connections that may be prone to bypass.

(ii) enable price/quality trade-offs

The Commerce Commission's Default Price-Quality Path regime limits incentives to offer price/quality trade-offs. It is not practical to offer mass market consumers a price/quality trade-off on an individual basis, given the nature of fault response and shared use of network assets. Nelson Electricity cannot offer slower response times or less redundancy to some mass market consumers and not others. Nelson Electricity has more ability to offer price/quality trade-offs to consumers that connect at higher voltages, but few incentive opportunities exist to do so especially if there is a want for lower quality. SAIDI/SAIFI is recorded on faults that are 11kV or higher. If Nelson Electricity entered into an agreement with a consumer connected to the HV network that offered lower lines charges and lower service quality, there is a risk of a higher SAIDI/SAIFI than we would otherwise incur – increasing our chances of breaching quality standards.

Nelson Electricity engages with larger consumers who are looking for a network service offering that differs from the current pricing. **Currently, there are two direct connection contracts and one non-standard arrangement. All three have differing requirements which have been met and are all mutually beneficial.**

Price/quality trade-offs for smaller consumers in Load Groups 1 and 2 are primarily around choosing the pricing option that is most appropriate to their situation. Currently there are several pricing options available to them.

(d) Development of prices should be transparent and have regard to transaction costs, consumer impacts, and uptake incentives.

The information provided in this Pricing Methodology demonstrates the transparent process used in setting of prices. This Methodology includes information around benefits or incentives of each currently available pricing option. It is expected that with a new cost-reflective pricing structure that is being considered for introduction on 1 April 2023 that there will be appropriate levels of additional information included regarding consumer impacts and uptake incentives. The new pricing would likely see a transition to minimise any price shocks for adversely affected consumers.

The development of prices focusses on achieving efficient outcomes for the long-term benefit of customers. In addition to this, retailer transaction costs are also taken into consideration.

In recent years, while there have been no wholesale changes to pricing, we have however introduced a range of changes to simplify the application of our pricing.

2010 Simplified Loss Codes and naming convention to better align with Load Groups and reduce risk of confusion. This made billing easier for retailers as the original codes were numeric and conflicted with some systems.

2015 Changed the start date by one month of when the Load Group 3 annual Winter Demand reset was to apply from. By changing the start date from September to October meant that the retailer could advise its customers within appropriate notice periods.

2017 Moves to standardisation expressed all prices in dollars which had previously been a combination of dollars and cents.

2018 Introduction of the NEL Pricing Guide to provide Electricity Retailers and electricity consumers assistance in the application of the charges for delivery of line function services on the Nelson Electricity Network.

Additional 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 must be recognised that consumer behaviour, 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 behaviour will be based more on electricity retailer offerings. 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 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 have been changes in cost allocations given the reduced requirement for utilisation of ripple control for network related constraints or operational requirements. Ripple control is now principally used for minimising transmission related constraints so reducing transmission costs for consumers. This can be seen in the pricing schedules where **the transmission component is almost completely removed from the controllable pricing options**. Notwithstanding any material changes in growth forecasts or transmission pricing levels or the transmission pricing methodology, it is expected that line prices will remain around similar levels for the new five-year DPP3 pricing period.

Nelson Electricity does not have any significant expenditure projects or material changes to its Asset Planning in the coming years that will materially affect line charges. Future load increases will see parts of the low voltage network start to be constrained and so there may be additional renewal/growth expenditure or the utilisation of load control or other load shifting options to mitigate against this.

Nelson Electricity currently offers a Time of Use line price option for larger commercial consumers. It is optional for all larger commercial consumers with a connected capacity up to 150kVA, above

150kVA is compulsory. This option is of benefit if those consumers can manage their load during peak winter demand times and 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's pricing structure has remained stable for several years. The structure has provided 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 considered 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's line charges. This assisted retailers in reducing transaction costs.

Overarching the network pricing is that Nelson Electricity considers 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 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 that most 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 provide 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.

4. Distribution Network Characteristics

Nelson Electricity is supplying the following types of connections:

- Unmetered/Builders temporary – 49
- Residential – 7,774
- Small / Medium business – 1,381
- Larger Business (Time of Use) – 91

Nelson Electricity's pricing combines the residential and small/medium businesses (Load Group 2) for the purposes of pricing as the load characteristics are similar. The Electricity (Low Fixed Charge Tariff Option for Domestic Consumers) Regulations 2004, require Nelson Electricity to have a 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 Nelson Electricity network is centred on the business district of Nelson City and 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 increases to start the day and residential is dropping off after the morning breakfasts and showers. The key driver is the high level of electrical heating load for both residential and business.

Nelson Electricity is a small network and, as such, it is assessed that 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.

5. Discussion on the Existing Pricing Regime

The existing Nelson Electricity delivery pricing has been developed and modified to cater to the changing dynamics of the Nelson Electricity network. Network costs are allocated across all Load Groups and the pricing moves towards a more cost reflective regime where possible. Given the network is small geographically, there is no real benefit to have multiple pricing regions except for one small area on the network of which the economic cost for Nelson Electricity is greater than the revenue received.

Nelson Electricity as an Electricity Distribution Business 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.

5.1 Time of Use

The Time of Use pricing is for larger commercial connections. The pricing regime has not been materially changed since its introduction in the early 1990s. The delivery prices are split into five separate categories and priced accordingly so to ensure as much as possible that larger consumers are paying their fair share of the delivery costs and that there is minimal cross subsidisation. These prices are designed to be cost-reflective. The delivery prices in this group are clear and targeted which should incentivise the consumer to alter behaviour to minimise its delivery charges which will assist in optimising and maximising the utilisation of the network.

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 can change both to reduce their overall delivery charges and also assist in making the Nelson Electricity network more efficient. Given the pricing option has been in place for over 20 years, most of the efficiency gains have already been achieved in this group.

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

5.2 Mass Market

All Commercial 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 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 - bed and breakfasts as an example. 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 fixed daily price which was a one size fits all to a price based on actual fuse size. This means that the larger mass market consumers pay a fixed delivery price based on their connected fuse size which is their ability to consume a higher electrical demand. They can also reduce their fuse size (free of charge) if they can change their load consumption behaviour. This delivery 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 delivery prices.

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

One complication with the capacity based fixed delivery price is the Electricity (Low Fixed Charge Tariff Option for Domestic Consumers) Regulations 2004 which means that a residential consumer using less than 8,000kWh must have access to a regulated fixed delivery price of which is increasing as the regulations are phased out. To comply with this regulation and to minimise delivery 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 compared to 7,400kWh per year in 2008. This is 9% lower than the deemed average consumer as determined under this regulation. This exposes Nelson Electricity to more cross subsidisation if more consumers switch to this price option. Of concern to Nelson Electricity is up to 70% of all residential consumers would benefit from being on the Low Fixed Charge option (Group 1). It is noted that in 2022 the number of consumers switching over has reduced to a point where they are offset by consumers switching back, so the issue has significantly lessoned.

While the Electricity (Low Fixed Charge Tariff Option for Domestic Consumers) Regulations 2004 are being phased out, Nelson Electricity is exploring options to minimise the cross subsidisation as much as possible 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.

6. Changes to the 1 April 2022 Pricing

The Nelson Electricity delivery prices will be changing 1 April 2022.

Line prices will be adjusted to increase revenue by approximately 1.1% overall and the Pricing Methodology has some terminology changes to align with the Electricity Networks Association Pricing Guidelines.

The Nelson Electricity Delivery Price Schedule that applies from 1 April 2022, is included in Section 12.

7. 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

7.1 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.

- <u>Load Group 0</u>
  Unmetered Load or Metered Builders Temporaries. This group 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 builder's 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.

- <u>Load Group 1</u>
  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. A residential connection is where electricity is supplied to a premise that is used or intended for occupation by a person principally as a place of residence. It does not include a premise that constitutes any part of a premise described in section 5(c) to (k) of the Residential Tenancies Act 1986 (which refers to places such as jails, hospitals, hostels, hotels, and other places providing temporary accommodation). 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 is typically categorised as Load Group 2.

- <u>Load Group 2</u>
  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 commercial consumers are grouped together as much as Electricity (Low Fixed Charge Tariff Option for Domestic Consumers) Regulations 2004 allow. Existing residential consumers are all assessed as 15kVA. Electricity network 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 it has removed any price discrimination that existed when commercial and residential were grouped separately.

- <u>Load Group 3</u>
  Large Commercial 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 1990s 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 can 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.

- <u>Load Group 4</u>
  This group is for the largest commercial consumers on the network. Consumers with capacity supplied of greater than 3000kVA with supply from dedicated 11kV/400V substations.

7.2 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 Nelson Electricity's pricing allocations as described further in this report. Information used for the 2021-2022 year is as follows:

- Number of Connections per group.

Number of Connections

Load Group	Connections
0	49
1	4360
2	4825
3	90
4	1
Total	**9,325**

- Anytime Peak per group.

Anytime Peak

Load Group	Peak kVA
0	140
1	13,080
2	19,300
3	8,933
4	2,885
Total	**44,338**

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

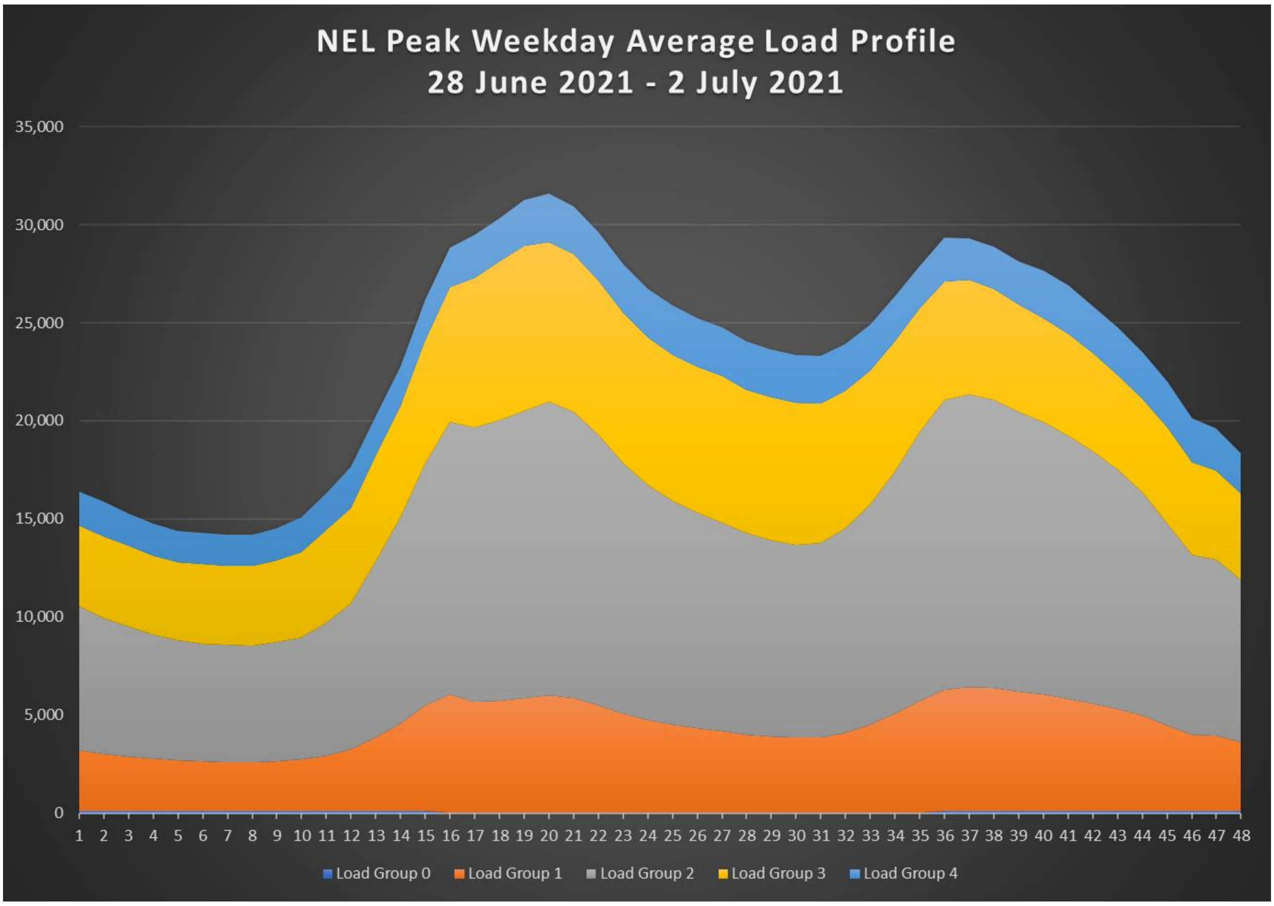
- Winter Demand Peak per group.

Control Period Demand (Winter Demand)
kVA

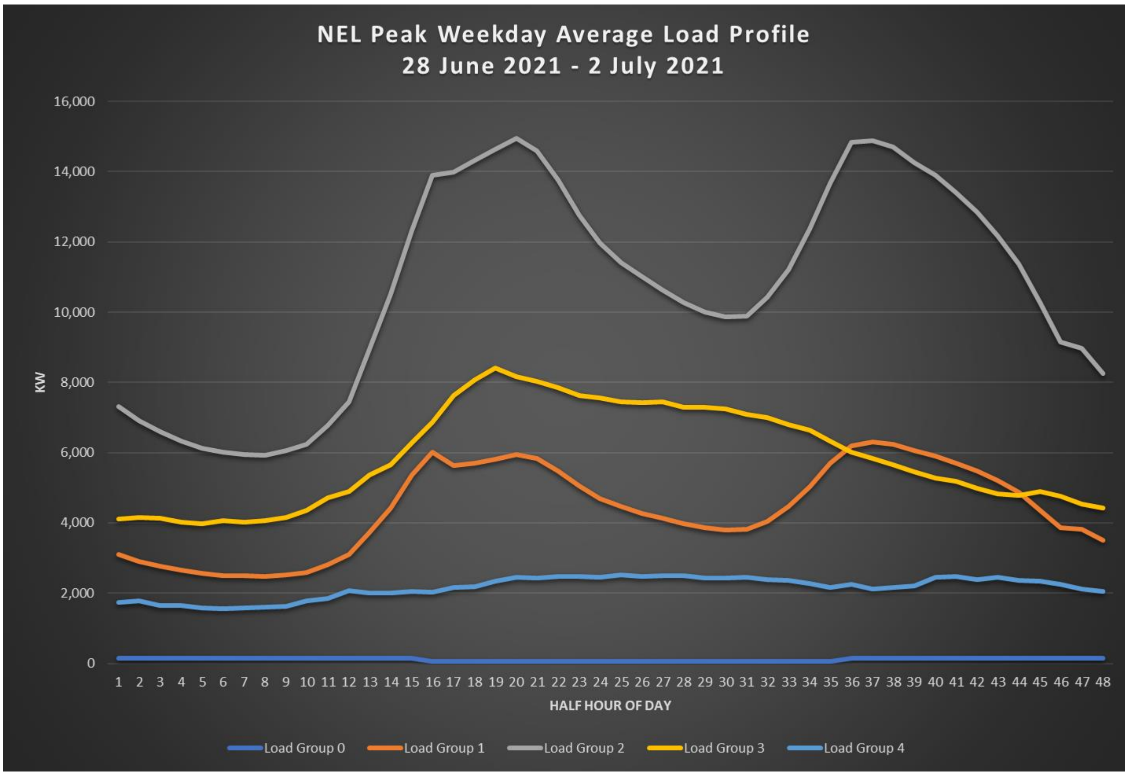
Load Group	8:30 am - 11:30 am	5:00 pm - 6:00 pm	CPD Allocation
0	50	95	**61**
1	5,736	5,944	**5,788**
2	14,380	14,266	**14,352**
3	8,026	6,170	**7,562**
4	2,338	2,195	**2,302**
Total	**30,530**	**28,670**	**30,065**

Nelson Electricity has a winter load that peaks between 8.30 am – 11.30 am and 5.00 pm – 6.00 pm. The morning load is predominantly commercial load with the morning residential load dropping off and the evening peak is typically influenced by the residential load with the commercial 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 each load group contribution to the average peak winter load profile for the highest consumption week Monday 29 June 2020 – Friday 3 July 2020. The impact of load control of hot water during the weekday mornings can be seen in Groups 1 and to a lesser degree Group 2.



- MWh per group.

MWh

Load Group	Winter	Summer	Total
0	288	306	594
1	12,634	11,181	23,815
2	28,955	28,991	57,946
3	18,435	23,038	41,473
4	6,638	7,757	14,395
Total	66,950	71,273	138,223

These consumption figures are estimated 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 December 2021 was 0.460MWh compared to 0.342 MWh for the previous 12 months.

- Regulatory Value of System Fixed Assets as at 31 March 2021 per group allocation

	Regulatory Value of System Fixed Assets					
Asset Group	**0**	**1**	**2**	**3**	**4**	**Total**
33kV Lines	$14,090	$967,367	$2,386,121	$1,380,444	$440,171	**5,188,194**
Zone Sub	$26,415	$1,813,581	$4,473,402	$2,588,001	$825,215	**9,726,614**
11kV Lines	$19,261	$1,442,694	$3,382,076	$1,887,015	$361,018	**$7,092,064**
11kV/400V Sub	$22,811	$1,883,115	$4,634,336	$1,787,895	$71,261	**$8,399,419**
400V Lines	$110,618	$2,148,747	$5,282,546	$1,157,320	$0	**$8,699,230**
Other	$11,021	$859,935	$1,969,644	$1,079,745	$137,716	**$4,058,060**
Total	**$204,215**	**$9,115,439**	**$22,128,124**	**$9,880,419**	**$1,835,382**	**$43,163,580**

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 2022 Nelson Electricity, being a price controlled EDB, has used the Commerce Commission's WACC for the five-year DPP price control period 1 April 2020 - 31 March 2025. This vanilla WACC of 4.23% is set at the 67th percentile.

Table 2: Values used to calculate WACC estimates for EDB DPP and Transpower IPP

Parameter	EDB and Transpower
Risk-free rate	1.12%
Average debt premium	1.60%
Leverage	42%
Asset beta	0.35
Equity beta	0.60
Tax adjusted market risk premium	7.0%
Average corporate tax rate	28%
Average investor tax rate	28%
Debt issuance costs	0.20%
Cost of debt	2.92%
Cost of equity	5.00%
Standard error of WACC	0.0101
Mid-point vanilla WACC	**4.13%**
Mid-point post-tax WACC	**3.78%**

*The numbers are rounded to two decimal points.

Based on the above input parameters, the Weighted Average Cost of Capital (WACC) is 4.23% of Regulatory Asset Base = $1,826k.

7.3 Allocation and Recovery of Network and Transmission Charges

Network Delivery Prices are set to recover indirect operating costs, direct operating costs, depreciation and cost of capital. The setting of the charges also considers historical charging practices and methodologies.

The company annual revenue requirements for 2022/2023 are:

Operating Costs (Network R&M)	$823k
Transmission Costs	$2,685k
Overhead Costs	$1,710k
Depreciation	$1,861k
Target Return (before tax)	$1,574k

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 will likely be introduced in 2023.

7.4 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	$45,657	$14,379	$6,235	$8,805	$20,278	**$95,352**
1	$173,575	$449,523	$651,995	$393,013	$229,378	**$1,897,483**
2	$428,353	$1,309,068	$814,575	$954,055	$921,627	**$4,427,678**
3	$166,891	$691,853	$180,513	$425,995	$378,777	**$1,844,029**
4	$8,617	$220,459	$55,725	$79,133	$25,280	**$389,214**
Total	**$823,093**	**$2,685,281**	**$1,710,000**	**$1,861,000**	**$1,574,382**	**$8,653,756**

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 group's 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, eg; 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	0.26%	18.52%	46.30%	26.13%	8.79%	**100.00%**
Zone Sub	0.26%	18.52%	46.30%	26.13%	8.79%	**100.00%**
11kV Lines	0.26%	19.39%	47.18%	26.13%	7.03%	**100.00%**
11kV/400V Sub	0.26%	21.99%	54.65%	20.91%	2.20%	**100.00%**
400V Lines	1.26%	24.64%	61.03%	13.07%	0.00%	**100.00%**
Other	0.26%	18.52%	46.30%	26.13%	8.79%	**100.00%**
Operational Cost Allocation						
Asset Group	**0**	**1**	**2**	**3**	**4**	**Total**
33kV Lines	$88	$6,037	$14,892	$8,616	$2,747	$32,380
Zone Sub	$139	$9,573	$23,614	$13,661	$4,356	$51,344
11kV Lines	$190	$14,245	$33,394	$18,632	$3,565	$70,026
11kV/400V Sub	$337	$27,788	$68,387	$26,383	$1,052	$123,947
400V Lines	$4,351	$84,509	$207,759	$45,517	$0	$342,136
Other	$552	$43,072	$98,656	$54,082	$6,898	$203,260
Sub Total	$5,657	$185,226	$446,702	$166,891	$18,617	$823,093
Reallocation	$40,000	-$11,651	-$18,349		-$10,000	**$0**
Total	$45,657	$173,575	$428,353	$166,891	$8,617	**$823,093**

- Transmission Costs – Transmission costs are an unavoidable cost. It covers the upstream costs from our sub-transmission connection points at STK0331. The major component in transmission cost 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 group's 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 charges. The uncontrolled prices recover 97% of the cost and the controlled water option recovers the remaining 3%. **The 3% recovery of transmission charges through controlled hot water pricing option represents that load control was not operational during all the times the transmission RCPD peaks occurred.** The 'night only' option does not have any allocation as transmission peaks do not occur at night. For Groups 3 and 4, transmission costs are recovered via a mixture of winter control period demand charge (45%) and a kWh charge (55%).

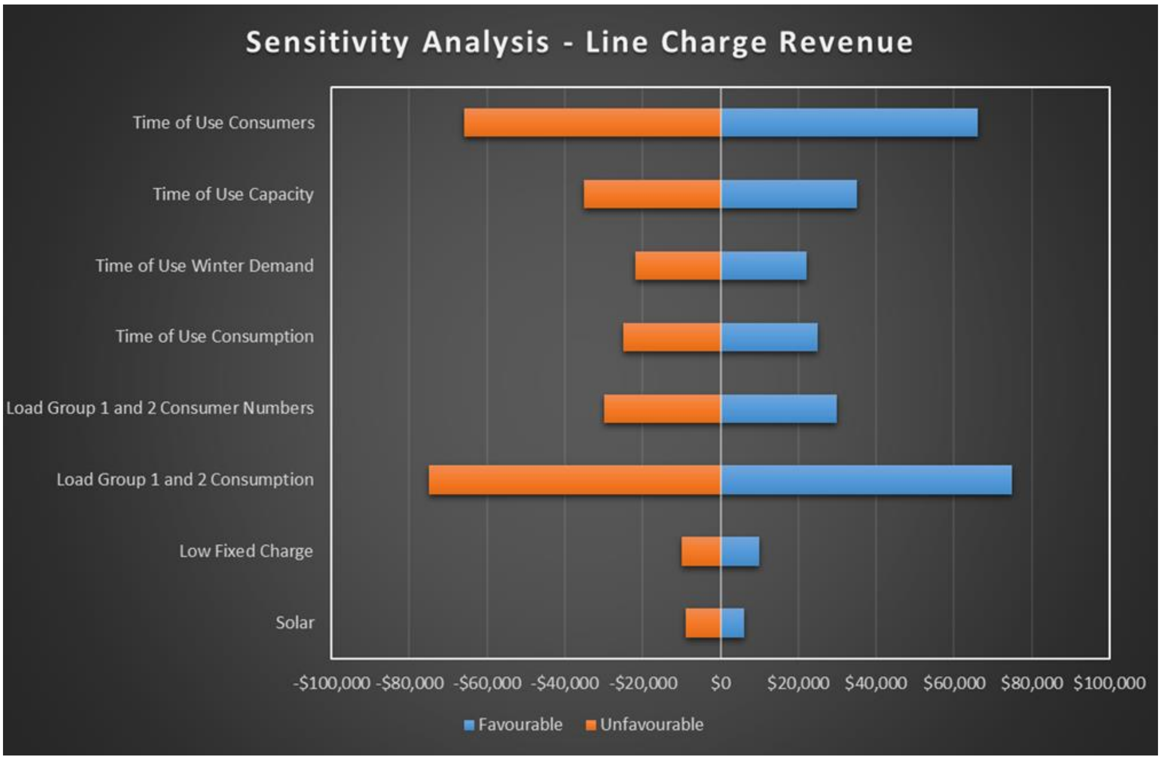
- Overhead Costs – Are apportioned by using two measures. The number of network connections and the maximum demand of the load group. This gives a balance of spreading overhead costs between the business of selling capacity and the number of consumers connected.

- 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.

7.5 Sensitivity Analysis

The Nelson Electricity revenue estimate for 2022-2023 is 2023 is $8,654k. There is a potential variation of 3.1% or a range from $8,380k to $8,920k for the year.



7.6 Fixed v's Variable Charges

The proportion of charges that are deemed by Nelson Electricity as fixed or variable had been set based on the historical pricing methodologies. Nelson Electricity had maintained a pricing mix that has been consistent for well over 10 years and as this pricing methodology has worked well.

The only major variation in price has been the provision of a low fixed charge price 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. With the certainty of this regulation being phased out, Nelson Electricity can now look to implement cost reflective pricing.

Nelson Electricity did review the Electricity Authority's recommended derivation of pricing approach for 2022 with attempting to determine the revenue required from pricing signals then recover remaining revenue through using pricing that least-distorts choices. The outcome was that with no constraints on the network in the short term, that the pricing signals required would be low and result in 10% to 20% of revenue derived through variable charges and the rest made up of some form of fixed charges. It is determined that a transitional approach would be required to reach truly cost reflective pricing. As a step in this direction, the proportion of revenue from variable charges was reduced from 46% down to 41%.

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	100%	$95,027	0%	$325	**$95,352**
Group 1	25%	$478,232	75%	$1,419,251	**$1,897,483**
Group 2	62%	$2,735,164	38%	$1,692,513	**$4,427,678**
Group 3	78%	$1,437,604	22%	$406,425	**$1,844,029**
Group 4	100%	$389,214	0%	$0	**$389,214**
Total	**59%**	**$5,135,241**	**41%**	**$3,518,514**	**$8,653,756**

Consumer behaviour as a response to network pricing is limited. The line price revenue represents 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 behaviour 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 kWhs, while not increasing their peak demand, is extremely low compared to a consumer wanting more capacity where there is a cost associated with the increases in peak demand.

For further breakdown on the revenue influence of specific prices, refer to Section 13 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 that the low consumption does not make metering practical or economic for retailers. 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 and the load characteristics do not 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. Currently the main peak time cost is the transmission, which ultimately accounts for 23% of the total line charge revenue for the Load Group. Almost all the transmission costs are allocated to the uncontrolled pricing option. 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 11.00 pm and 7.00 am, typically used for larger hot water cylinders and night storage heaters.

- Distributed Generation. A price is included based on kWh exported onto the NEL network. This price recovers some of the costs associated with the auditing and safety aspects of the distributed generation connection.

For the average Group 1 customer, fixed prices recover approximately 25% 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. Typically, there has been approximately 200 to 300 consumers per year shifting from Group 2 to Group 1, this has reduced significantly in the current year. 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 (Residential and Commercial)**
  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. Currently the main peak time cost is the transmission, which ultimately accounts for 30% of the total line charge revenue for the Load Group. Almost all the transmission costs are allocated to the uncontrolled pricing option. 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 11.00 pm and 7.00 am, typically used for larger hot water cylinders and night storage heaters.

- Distributed Generation. A price is included based on kWh exported onto the NEL network. This price recovers some of the costs associated with the auditing and safety aspects of the distributed generation connection.

For the average Group 2 customer, capacity-based charges recover approximately 62% 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 price 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 ie, fixed daily charge of no greater than 30 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 10 potential fuse size combinations). To comply with the requirements and remove the potential complexity, the residential consumers in Group 2 (3,414) currently have their fused capacity set at 15kVA while non-residential (1,411) have capacity based on actual fuse size.

- **Load Groups 3 – Large Commercial**
  This Price Group is designed for the larger installations on the network. These sites must have Time of Use metering installed. Nelson Electricity can set network prices based on the individual site configuration and usage pattern more accurately. The prices in this category are explained below.

1. **Metered Installation**. This is a fixed priced per connection designed to capture the fixed network admin costs associated with each connection. The value is the same no matter what size.

2. **Winter Demand**. The Winter Demand is a \$/kW/day fixed price and is a method of apportioning transmission and network peak demand costs. The measure is the single highest half hour kVA demand recorded in the months of June, July, and August between 8.30 am-11.30 am and 5.00 pm-6.00 pm. The winter demand assessment period excludes weekends and public holidays. The winter demand value is used for billing purposes from the October month for the following 12 months until reset again the after the following winter.

3. **Capacity Supplied**. Capacity Supplied is a \$/kVA/day fixed price and is the actual size of the connection to the Network (either fuse size or transformer size). This represents the maximum demand the site can draw from the network. This charge is used to recover local network costs.

4. **Energy**. The Energy charge is a variable price based on the total energy consumption for the connection. This is used to recover both transmission and network costs.

5. **Power Factor**. This monthly variable price is used to encourage consumers to maintain a power factor of greater than 0.95. The charge is for the kVAr required at peak time to bring the power factor up to 0.95. A charge is not applied if power factor at peak is > 0.95.

6. **Distributed Generation**. This in a new variable price that is for kWh exported onto the network. This recovers costs associated with the auditing and safety aspects of the distributed generation connection.

7.7 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 to cater to those connections on multiple phases prior to the capacity charges coming into effect.

7.8 Changing Pricing Plan Limitations

Where a consumer has a choice of pricing plan, Nelson Electricity reserves the right to limit changes between pricing plans to one change in any 12-month period eg; 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.

8. Future Changes

8.1 Background

The old electricity supply model has changed 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:

- **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.
- **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.

These technologies, particularly when used together, provide electricity users the ability to manage their electricity 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/support option. Any new pricing structure needs to cater to both and all in between.

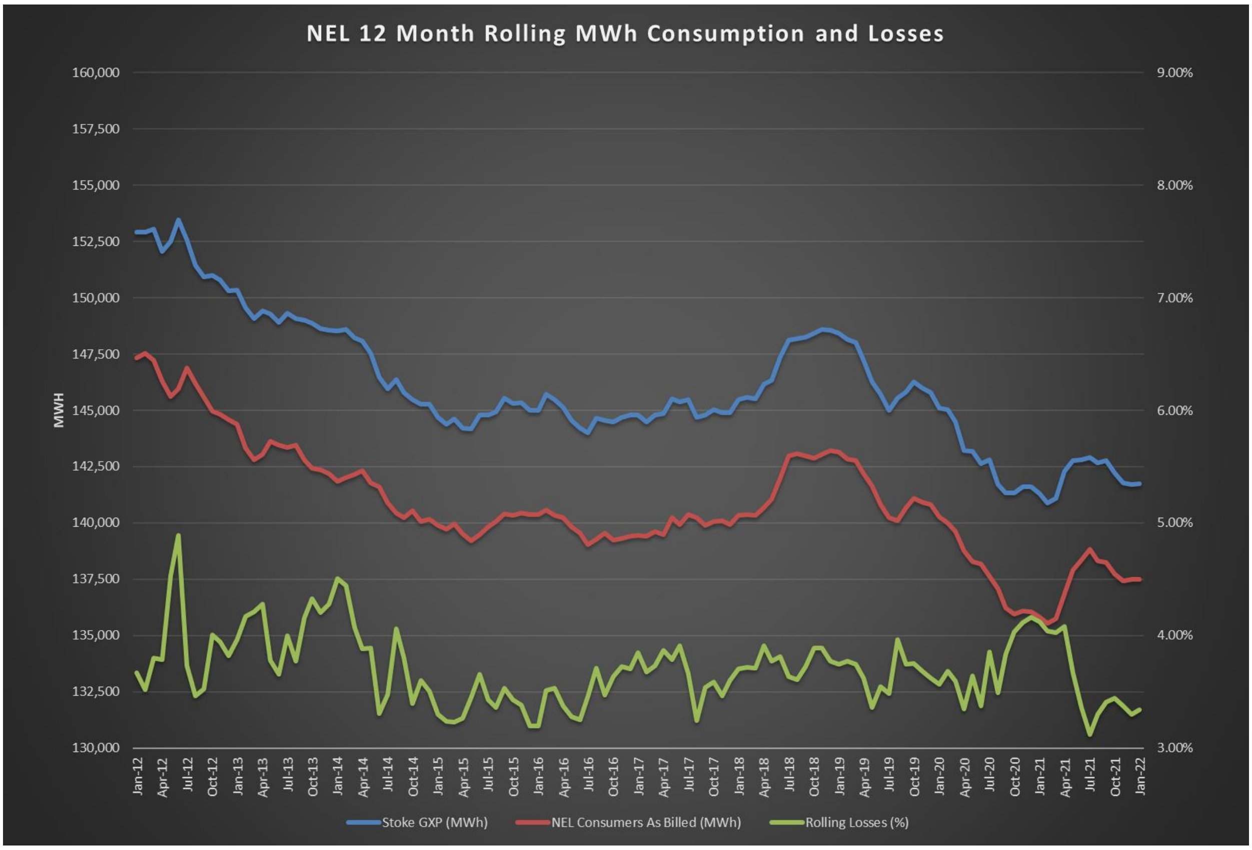
The current regulatory environment around pricing limits Nelson Electricity's ability to introduce an effective pricing structure that is fair to all consumers, this is however changing with the phasing out of the Electricity (Low Fixed Charge Tariff Option for Domestic Consumers) Regulations 2004. Consumers who can afford to invest in distributed generation and batteries among other things are not paying their fair share of network related costs. These costs are being subsidised by consumers that currently do not or cannot afford to invest in these technologies. Any new pricing must ensure this pricing imbalance is removed as much as practically possible.

The electricity consumer will ultimately decide on the future viability and shape 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 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 into the review of technologies, consumer behaviour and pricing options. This has been achieved principally through working with both shareholders and 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 New Zealand as much as possible. The DPWG is published a paper on future pricing which provides some assistance in this regard. Unfortunately, with such a significant change, it has taken time and as a result a new cost-reflective pricing structure is being considered for introduction on 1 April 2023

8.2 Current Consumption Trends

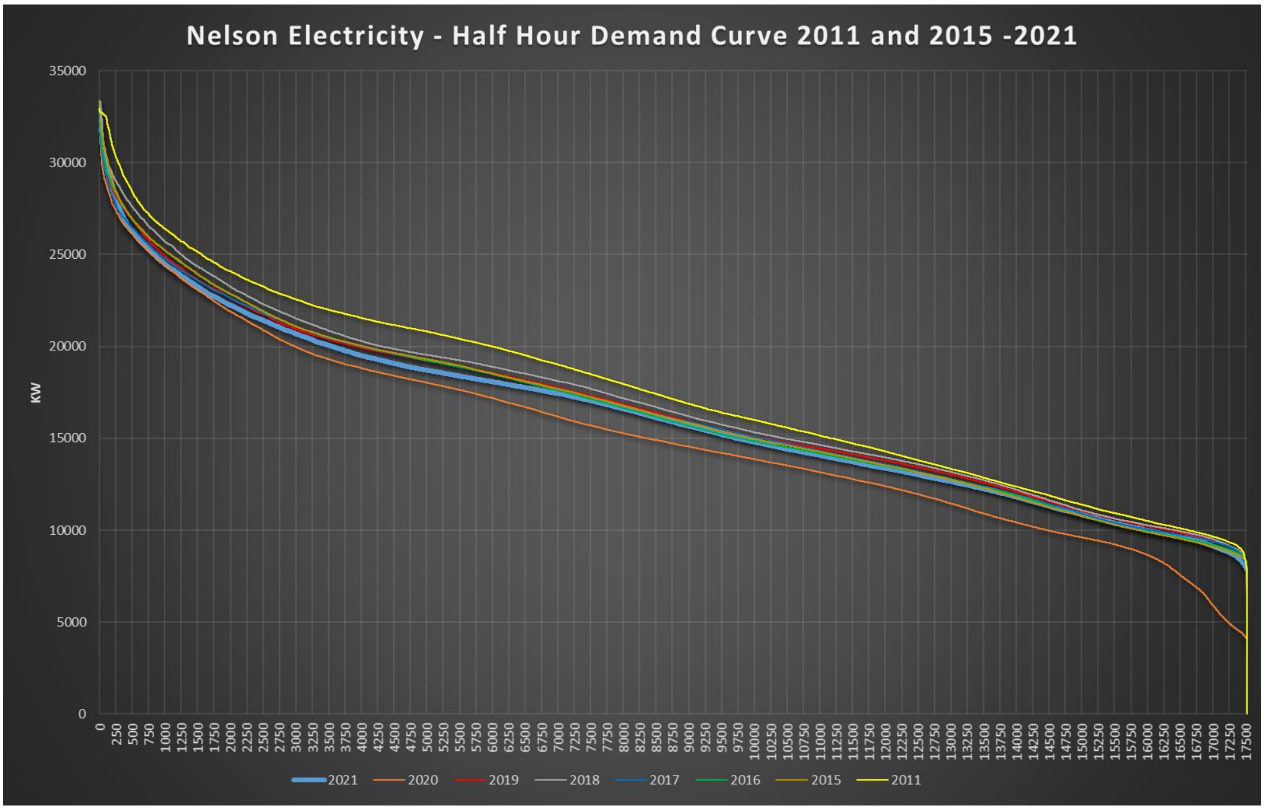


As discussed elsewhere in this document, electricity consumption on the Nelson Electricity network had been declining since 2008 but flattened off in recent years. Analysis of all consumer groups gives some indications as to where the changes are taking effect. Analysis of billing reports have shown that the average residential consumption on a per consumer basis has decreased 8.8% since 2008 to approximately 6,750kWh per consumer.

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 **<u>will have excess capacity</u>** for the network for the foreseeable future because of this long-term investment.

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 Nelson Electricity half hour kW demand curve comparison graph below compares the 17,520 half hour demands for 2011 and 2015 through to 20221. This shows overall consumption has reduced since 2011 and that 2015 through to 2021 were at similar levels except for a rise in 2018 which was due to a cooler than normal winter.

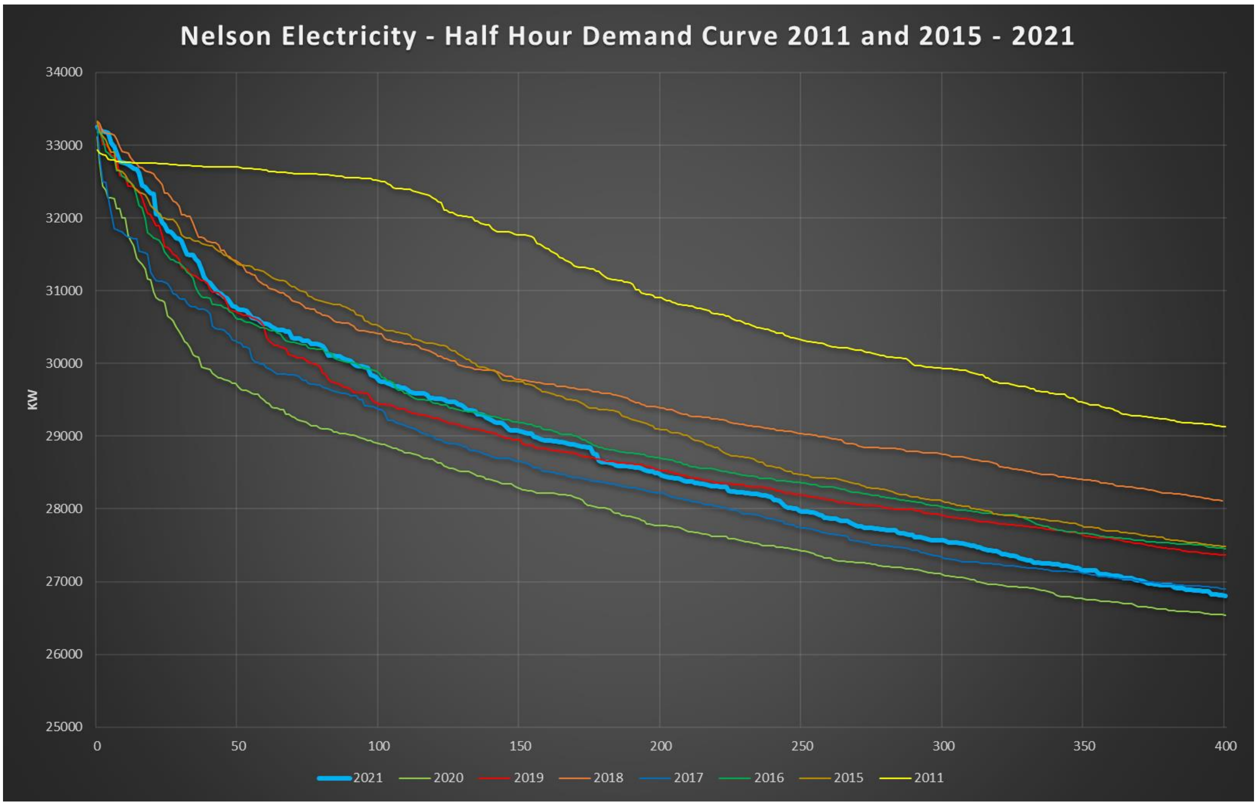


When reviewing the top 400 peaks for each of the same years as above, in the graph below you can see the 2011 year is influenced more by load control compared with the more recent years.

The 2011 top peaks flatten off where the peaks from other years do not.

Note that in 2011 the network was constrained at the Sub-Transmission and Zone Substation level so load control was used extensively during the winter months to minimise peak demand.

The years 2015 through to 2021 years have less use of load control at peak times due to the additional Sub-Transmission feeder and new Zone Substation in service eliminating the previous supply constraints.



8.3 Issues for Future Pricing Changes

Nelson Electricity is cognisant of the opportunity that advanced meters are presenting to most electricity consumers in the Nelson area. There is now increased consumption information available for consumers and provide retailers with more opportunity to introduce new price offerings and increasing pricing variations.

With the medium term (5–10 years) forecast of some low voltage load constraints, pricing will need to factor in a greater requirement for load management other than for just minimising transmission peaks. The value of this load management requirement to eliminate constraints or defer network investments will be factored in this cost reflective pricing from 2023. This will provide electricity consumers with some price certainty when making long term investment decisions with any of the technologies mentioned in Section 8.0.

Nelson Electricity has undertaken some work regarding pricing structures and will be looking to implement changes in 2023.

The development of a form of **cost-reflective pricing** to ensure a fair economic cost allocation will likely keep a fixed daily price based on fuse size or capacity but could shift away from simple kWh charges to a methodology that could focus on demand at critical times or a Time of Use pricing regime. 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 must be recognised that networks sell capacity or demand not kWhs. KWhs have been used as a proxy for demand up until 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 (advanced 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 electrical load since its introduction. It is critical that this is retained. It is desirable that any new demand charging option excludes any load controlled by ripple control.

8.4 Pricing Issues

A pricing structure and transition plan needs to be in alignment as much as possible as other Networks. Consumers must 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 is 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 eg; 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.

<u>Seasonal price shock</u>. In a true cost reflective pricing structure, most of the network cost recovery should occur during the winter months. This, however, 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 versus being truly cost reflective.

<u>Individual customer price shock</u>. 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.

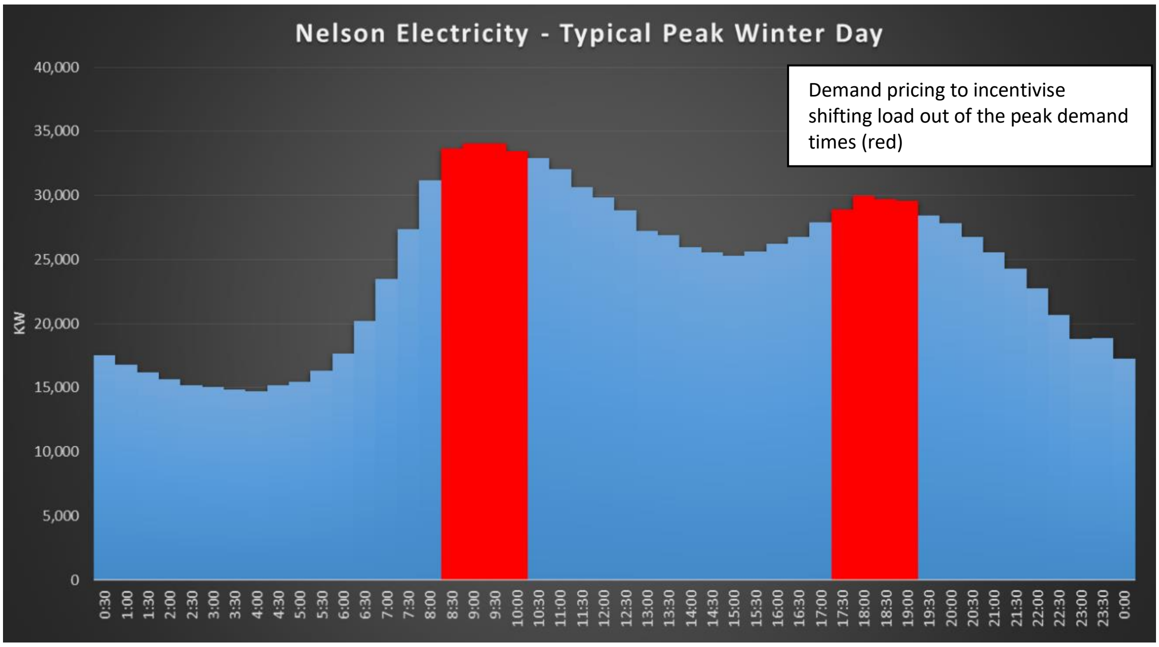
8.5 Pricing Options

Nelson Electricity has been looking at several 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.

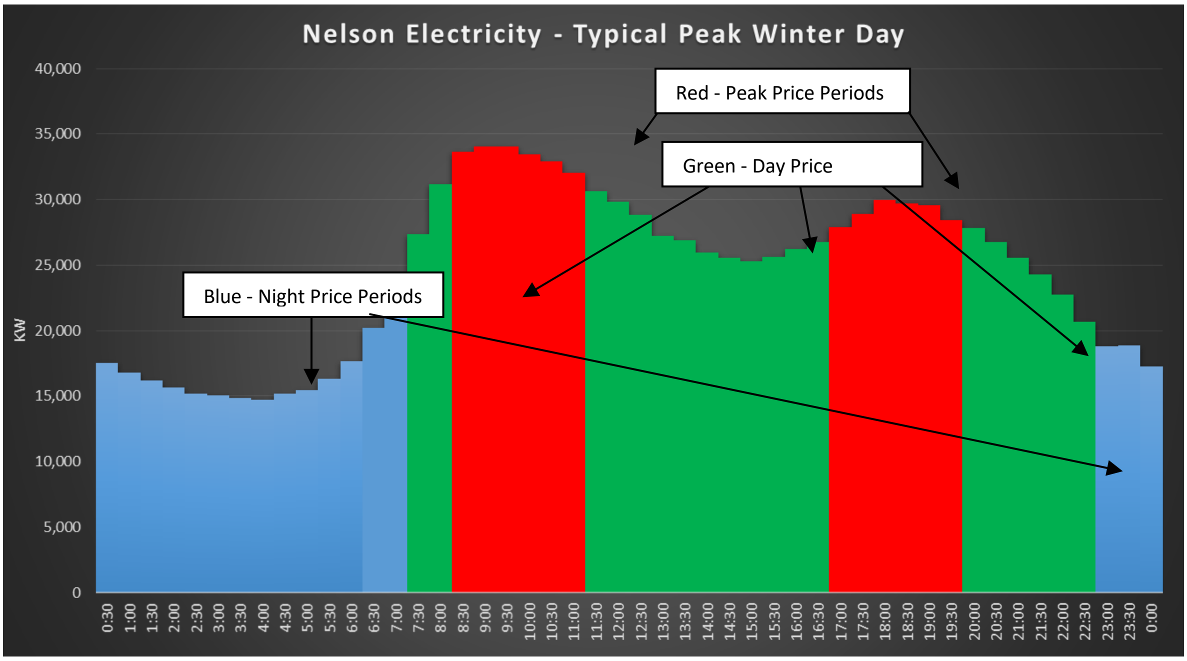
Demand Charge - Introducing a control period **demand charge** during peak demand timeframes. The timeframe to be set based on the likely transmission peak pricing times (typically match Nelson network peak demand times). Peak demand excludes any hot water load control.



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 daytime 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.



8.6 Future Pricing Summary

A new cost-reflective pricing structure is being considered for introduction on 1 April 2023. This timeframe is in alignment with many other electricity networks.

It is likely any new pricing will be introduced as an additional pricing option that is optional to take up. This removes or significantly reduces any public relations issues with winners and losers.

8.7 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 Roadmap has now been updated again to take into consideration the changes as discussed in this document. The Roadmap is included as Section 14 of this document. This Roadmap outlines the estimated timelines as of February 2022 should Nelson Electricity commit to introducing a new-cost reflective pricing regime applying from 1 April 2023.

Implementing future pricing as outlined in previous Roadmaps has been slowed mostly due to awaiting two key industry changes:

- The removal or phasing out of the Electricity (Low Fixed Charge Tariff Option for Domestic Consumers) Regulations 2004. This was a significant step in allowing Nelson Electricity to confidently transition over to a "Future Pricing Regime". This provides confidence that Nelson Electricity can recover costs in a cost reflective way for all consumers.

- The introduction of the new Transmission Pricing Methodology (TPM). The TPM aimed implementation of 1 April 2023 would make any new pricing for Nelson Electricity simpler and reduce the number of potential price shocks for consumers. It is accepted that if the TPM implementation is delayed another 12 months this would not inhibit NEL from considering introducing new prices from 1 April 2023.

The decision to delay implementing a “Future Pricing Regime” also considered the lower numbers of solar PV installations and Electric vehicles installed or purchased in/on or around the network. This has removed the timing urgency. We do see however that there will be increasing numbers installed/purchased and so accepting that implementing new pricing is vitally important for a sustainable network into the future.

There has been considerable work that has gone into setting of future pricing of which will not be apparent on the Future Pricing Roadmap.

8.8 Customer Consideration

Overview
Nelson Electricity communicates with customers mainly by way of radio advertising, newsprint and website covering issues relevant at the time including pricing.

Nelson Electricity also surveys customers periodically to get a better understanding of their wants and needs and where Nelson Electricity can improve.

Informal feedback, because of the price and quality information from the mass market, indicates customers have lost touch with the role an Electricity Distribution Business plays in the electrical industry since the separation of Line and Energy companies in 1999. The mass market customer only considers the total electricity bill value without separating out delivery prices. The perception to them is that electricity prices are always increasing and have little regard to the fact that delivery prices have remained the same or at similar levels while retail electricity prices have increased (up until recent times). Consequently, it is difficult in some instances to discuss and demonstrate price versus quality trade-offs.

Consistent outcomes from surveys of both large and small consumers suggests they are happy with current reliability and not willing to pay more for an improved reliability. Also, they do not want to pay less for a less reliable supply.

Customer Consideration into Future Pricing is a Difficult Area
The Electricity Network Association undertake Consumer Workshops. In this they have determined there are broadly four types of consumers all with differing perspectives, wants and needs.

Pricing that can cater to all groups will be difficult. Cost reflective pricing which least distorts pricing signals is the only way to move forward.

Nelson Electricity will be undertaking consumer surveys in 2022 to cater for any localised themes or issues regarding new cost-reflective pricing.

9. Non-Standard Contracts

Nelson Electricity will consider offering a non-standard contract to consumers 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 coming year is $280k from the two non-standard contracts.

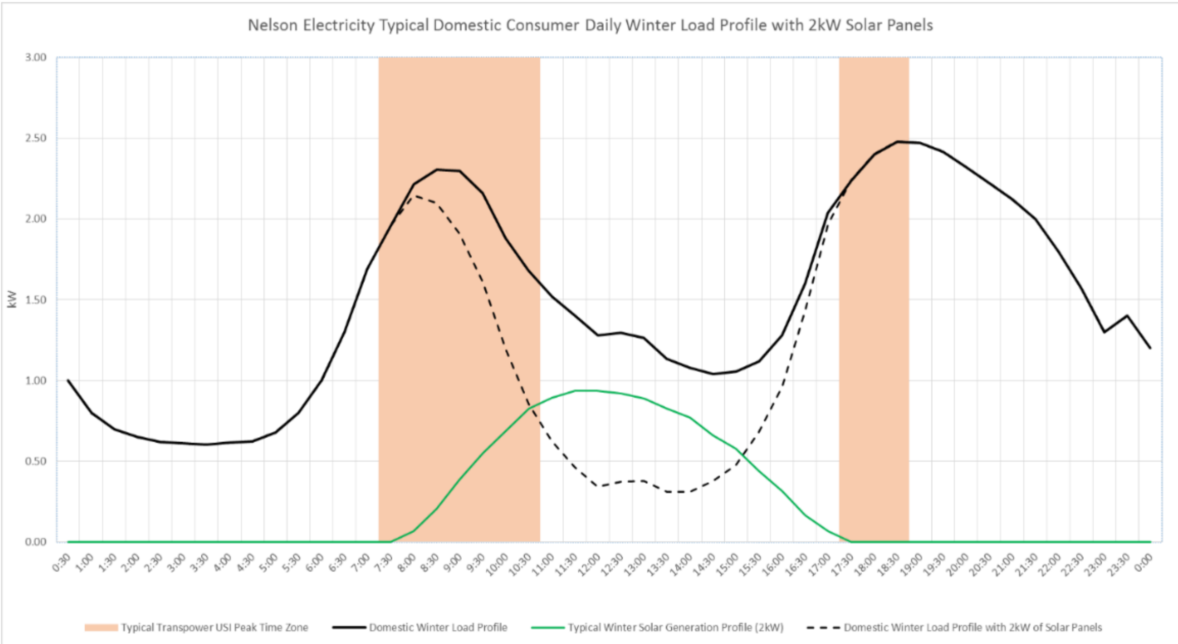
In determining a non-standard contract line charge, Nelson Electricity would determine the potential reduction in costs associated with a consumer connection if they were able to manage their load in a particular way. An example is a consumer being able to manage load in the transmission upper South 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 contract 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.

10. 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 level of cloud cover. The benefit of any solar distributed generation is negligible.

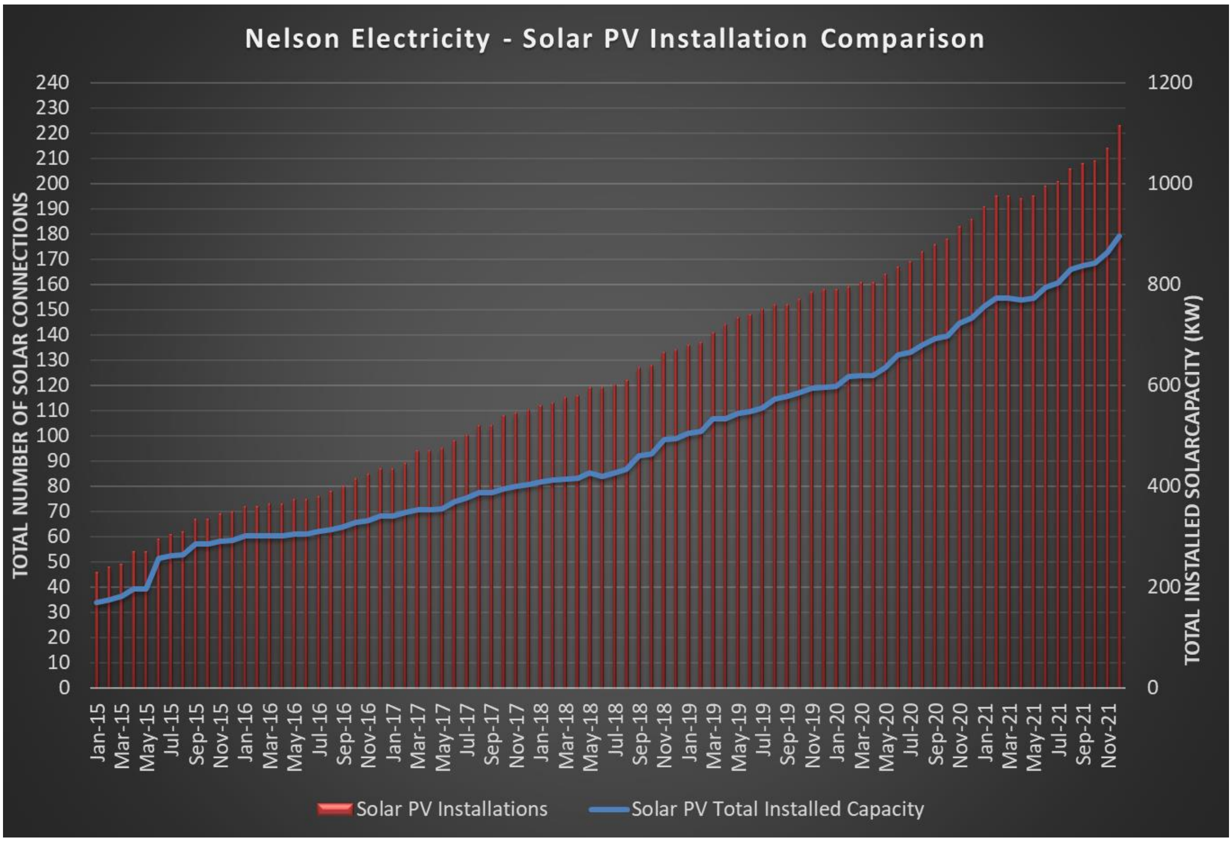


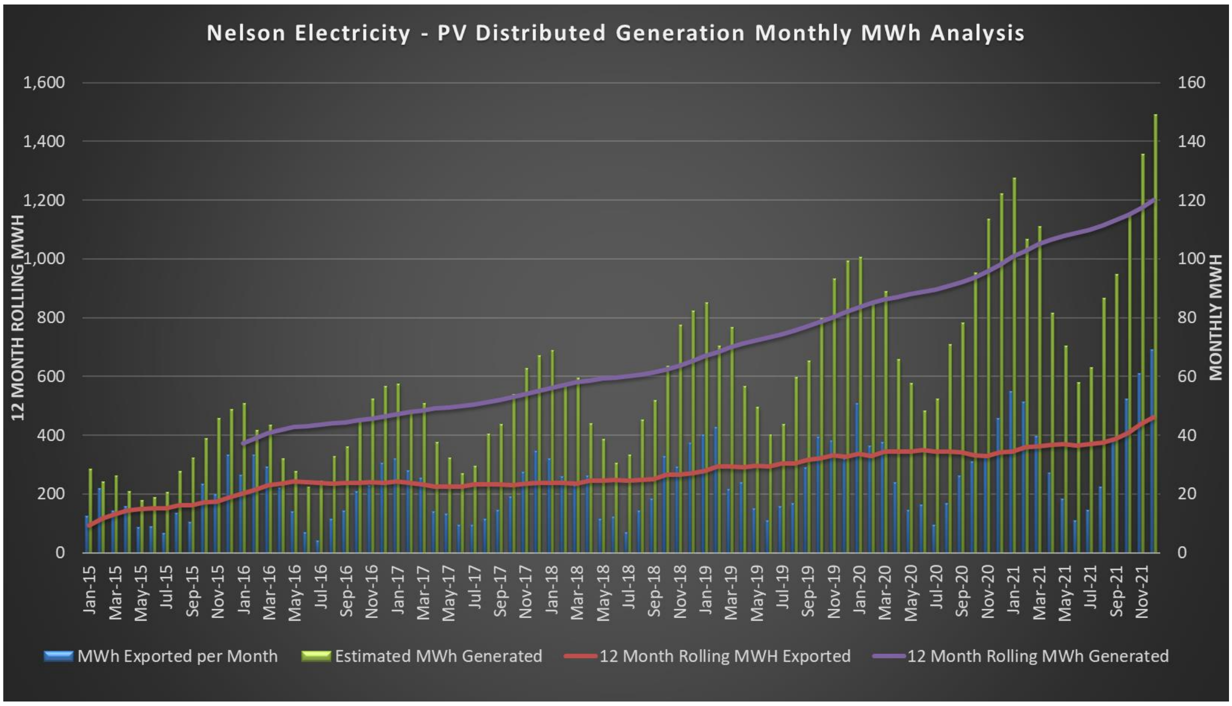
For this reason, Nelson Electricity does not offer any pricing benefit for distributed generation connections for either local line or transmission charges. Analysis of existing installations is being undertaken to ensure that any exported electricity is within the related voltage limits and of appropriate 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 Nelson Electricity network for Groups 1 and 2, and now introduced to Group 3 from 1 April 2018. Although the level of the price is only 0.5 cents per kWh, this is designed to capture some of the safety audit costs of distributed generation sites. As an example, the annual audit costs are 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 has 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 223 distributed generation installations on the network (as of December 2021) totalling 897kW of generating capacity. There were 37 new installations in the last 12 months. It is expected that the numbers will slowly increase as the installed price decreases.





11. 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.

12. Pricing Schedule

Nelson Electricity Ltd
Delivery Price Schedule
From 1 April 2022

NELSON ELECTRICITY LTD

Nelson Electricity Ltd is adjusting delivery prices effective 1 April 2022.

The prices in this schedule are used to charge electricity retailers for the delivery of electricity over the Nelson Electricity 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 on a customer's power account.

Nelson Electricity distributes electricity to connections in the central Nelson city including most of the Port, Port Hills, Nelson South, Toi Toi, Brook, Wood, Nelson East and CBD areas.

				New Delivery Prices from 1 April 2022			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)		11							
0-BT	Builders Temp - Fixed		$/day	0.8000	0.0000	**0.8000**	0.6000	0.0000	**0.6000**
0-BT	Builders Temp - Anytime		$/kWh	0.0550	0.0260	**0.0810**	0.0536	0.0274	**0.0810**
Unmetered Connection (< 1 kW)		37							
0-UM	Unmetered - Fixed		$/day	0.1500	0.0000	**0.1500**	0.1000	0.0000	**0.1000**
0-UM	Maximum Demend		$/kW/day	0.5700	0.4000	**0.9700**	0.5600	0.4200	**0.9800**
Streetlighting		1							
0-SL	Streetlight		$/day	190.70	28.30	**219.00**	191.00	30.00	**221.00**
Load Group 1									
Residential Low Fixed Charge (15kVA)		4360							
1-Fixed	Fixed		$/kVA/day	0.0200	0.0000	**0.0200**	0.0100	0.0000	**0.0100**
1-24hr	Anytime		$/kWh	0.0415	0.0260	**0.0675**	0.0536	0.0274	**0.0810**
1-Water	Controlled (Hot Water)		$/kWh	0.0390	0.0035	**0.0425**	0.0335	0.0137	**0.0472**
1-Night	Night Rate (11pm-7am)		$/kWh	0.0365	0.0000	**0.0365**	0.0209	0.0000	**0.0209**
1-DG	Distributed Generation		$/kWh	0.0050	0.0000	**0.0050**	0.0050	0.0000	**0.0050**
Load Group 2 (from 15kVA to 150kVA)									
General - Residential and Commercial		4825							
2-Fixed	Fixed		$/kVA/day	0.0710	0.0000	**0.0710**	0.0658	0.0000	**0.0658**
2-24hr	Anytime		$/kWh	0.0070	0.0260	**0.0330**	0.0080	0.0274	**0.0354**
2-Water	Controlled (Hot Water)		$/kWh	0.0045	0.0035	**0.0080**	0.0065	0.0137	**0.0202**
2-Night	Night Rate (11pm-7am)		$/kWh	0.0020	0.0000	**0.0020**	0.0051	0.0000	**0.0051**
2-DG	Distributed Generation		$/kWh	0.0050	0.0000	**0.0050**	0.0050	0.0000	**0.0050**
Load Group 3 LARGE COMMERCIAL (up to 2400kVA)									
TIME OF USE		91							
3-Fixed	Metered Installation		$/day	1.0000	0.0000	**1.0000**	1.1700	0.0000	**1.1700**
3-WD	Winter Demand (kVA)		$/kVA/day	0.1030	0.0650	**0.1680**	0.1020	0.0640	**0.1660**
3-24hr	Energy		$/kWh	0.0020	0.0100	**0.0120**	0.0020	0.0090	**0.0110**
	Capacity Supplied (one of)								
T-03	T-03	16kVA – 42kVA	$/day	2.06	0.00	**2.06**	1.88	0.00	**1.88**
T-04	T-04	43kVA – 69kVA	$/day	3.39	0.00	**3.39**	3.08	0.00	**3.08**
T-05	T-05	70kVA – 110kVA	$/day	5.40	0.00	**5.40**	4.92	0.00	**4.92**
T-06	T-06	111kVA – 138kVA	$/day	6.78	0.00	**6.78**	6.17	0.00	**6.17**
T-07	T-07	139kVA – 218kVA	$/day	10.70	0.00	**10.70**	9.74	0.00	**9.74**
T-08	T-08	219kVA – 300kVA	$/day	14.73	0.00	**14.73**	13.41	0.00	**13.41**
T-09	T-09	301kVA – 500kVA	$/day	24.55	0.00	**24.55**	22.35	0.00	**22.35**
T-10	T-10	501kVA – 750kVA	$/day	36.83	0.00	**36.83**	33.53	0.00	**33.53**
T-11	T-11	751kVA – 1000kVA	$/day	49.10	0.00	**49.10**	44.70	0.00	**44.70**
T-12	T-12	1001kVA – 1500kVA	$/day	73.65	0.00	**73.65**	67.05	0.00	**67.05**
T-13	T-13	1501kVA – 2000kVA	$/day	98.20	0.00	**98.20**	89.40	0.00	**89.40**
T-15	T-15	2400kVA	$/day	117.84	0.00	**117.84**	107.28	0.00	**107.28**
3-DG	Distributed Generation		$/kWh	0.0050	0.0000	**0.0050**	0.0050	0.0000	**0.0050**
3-PF	Power Factor <0.95		$/kVAr/mth	6.5000	0.0000	**6.5000**	6.5000	0.0000	**6.5000**

All prices exclude GST. All prices as shown above are also available from our website www.nel.co.nz

Pricing Guide - Details on how these delivered prices are applied are included in our Pricing Guide which is available on our website.

Load Group 0 - Unmetered loads that meet Electricity Authority Unmetered Load Guidelines and Metered Builders Temporary Supplies(Builders Temp > 7kVA use Load Group 2).

Load Group 1 - Residential households (principal place of residence only) with connection capacity of 15kVA using less then 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 <u>all</u> residential and commercial connections with capacity from 15kVA to 150kVA.

Load Group 1 & 2 - All existing residential households have an assessed connection capacity of 15kVA.

Load Group 3 - Available to any large commercial connections up to 2400kVA with Time of Use metering.

Load Group 1, 2 and 3 - Distributed Generation charge is for electricity exported into the Nelson Electricity network.

Any questions about the line charges, please email us at enquiry@nel.co.nz, or phone (03) 546-0486.

13. Price / Quantity / Revenue Schedule

Total Revenue Table using 31 March 2023 Prices and 2022/2023 Quantities

Number of Days: 365

Tariff or Fee	Number of ICPs at 31/03/2023	Billed kWh at 31/3/2023	Billed kVA at 31/3/2023	Billed Days at 31/3/2023	Distribution Charges – Fixed – $/day	Distribution Charges – Fixed – c/kVA/day	Distribution Charges – Fixed – Other	Distribution Charges – Variable (c/kWh)	Notional Distribution Revenue ($) – Fixed	Notional Distribution Revenue ($) – Variable	Total Revenue ($) P_{2023} Q_{2023}
Group 0											
Streetlights	1	590,207	-	365	219.00000	0.00000	0.00000	0.00000	79,935	-	79,935
Unmetered Fixed	37	-	-	13,505	0.15000	0.00000	0.00000	0.00000	2,026	-	2,026
Unmetered Capacity	0	-	9,862	-	0.00000	97.00000	0.00000	0.00000	9,566	-	9,566
Builders Temp	11	-	-	4,375	0.80000	0.00000	0.00000	0.00000	3,500	-	3,500
BT-kWh		4,015	-	-	0.00000	0.00000	0.00000	8.10000	-	325	325
									95,027 100%	325 0%	95,352
Group 1					0.00000	0.00000	0.00000	0.00000			
Fixed	4,360	-	23,911,602.00	-	0.00000	2.00000	0.00000	0.00000	478,232	-	478,232
Anytime		16,344,350	-	-	0.00000	0.00000	0.00000	6.75000	-	1,103,244	1,103,244
Controlled		7,019,872	-	-	0.00000	0.00000	0.00000	4.25000	-	298,345	298,345
Nightrate		450,336	-	-	0.00000	0.00000	0.00000	3.65000	-	16,437	16,437
DG		244,993	-	-	0.00000	0.00000	0.00000	0.50000	-	1,225	1,225
									478,232 25%	1,419,251 75%	1,897,483
Group 2					0.00000	0.00000	0.00000	0.00000			
Fixed	4,825	-	38,523,439	-	0.00000	7.10000	0.00000	0.00000	2,735,164	-	2,735,164
Anytime		49,303,683	-	-	0.00000	0.00000	0.00000	3.30000	-	1,627,022	1,627,022
Controlled		7,763,381	-	-	0.00000	0.00000	0.00000	0.80000	-	62,107	62,107
Nightrate		879,403	-	-	0.00000	0.00000	0.00000	0.20000	-	1,759	1,759
DG		325,192	-	-	0.00000	0.00000	0.00000	0.50000	-	1,626	1,626
									2,735,164 62%	1,692,513 38%	4,427,678
Time of Use		-	-	-	0.00000	0.00000	0.00000	0.00000			
Metered Installation Charge	88	-	-	32,259	1.00000	0.00000	0.00000	0.00000	32,259	-	32,259
Energy		32,347,929	-	-	0.00000	0.00000	0.00000	1.20000	-	388,175	388,175
Winter Demand		-	3,686,176	-	0.00000	16.80000	0.00000	0.00000	619,278	-	619,278
Capacity Supply (Sum of kVA)		-	10,261,245	-	0.00000	4.91000	0.00000	0.00000	503,827	-	503,827
Power Factor (kVAr)		-	3,705	-	0.00000	0.00000	6.50000	0.00000	24,082	-	24,082
DG		-	-	-	0.00000	0.00000	0.00000	0.50000	-	-	-
Direct Connection		-	-	-	0.00000	0.00000	0.00000	0.00000			
Energy		9,124,969	-	-	0.00000	0.00000	0.00000	0.20000	-	18,250	18,250
Installation	2	-	-	730	1.00000	0.00000	0.00000	0.00000	730	-	730
Winter Demand		-	633,275	-	0.00000	10.30000	0.00000	0.00000	65,227	-	65,227
Capacity Supplied		-	1,241,000	-	0.00000	4.91000	0.00000	0.00000	60,933	-	60,933
Power Factor (kVAr)		-	384	-	0.00000	0.00000	6.50000	0.00000	2,496	-	2,496
Transpower Cold Storage		-	1	-	0.00000	0.00000	35,538.00000	0.00000	35,538	-	35,538
Transpower NMDHB		-	1	-	0.00000	0.00000	93,234.00000	0.00000	93,234	-	93,234
DG		-	-	-	0.00000	0.00000	0.00000	0.50000	-	-	-
									1,437,604 78%	406,425 22%	1,844,029
TOU Sealord		-	-	-	0.00000	0.00000	0.00000	0.00000			
Fixed	1	14,394,754	-	-	0.00000	0.00000	389,214.00000	0.00000	389,214	-	389,214
Power Factor (kVAr)		-	-	-	0.00000	0.00000	6.50000	0.00000	-	-	-
					0.00000	0.00000	0.00000	0.50000			
									389,214 100%	- 0%	389,214
$\Sigma P_{2021} Q_{2021}$	9,325	138,222,899							**5,135,241** 59%	**3,518,514** 41%	**8,653,756**

14. Future Pricing Roadmap Table

Future Pricing Roadmap Checklist EDB : *Nelson Electricity Limited*

Roadmap Stages	Activities	2022 Q1	2022 Q2	2022 Q3	2022 Q4	2023 H1	2023 H2	2024	2025	Resource requirements
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	X								NEL / ENA / Shareholders
Communicate	Prepare and publish future pricing roadmap, include	X								NEL
Identify challenges	eg, resourcing implications, billing systems, EIEP1 file	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		X							NEL
Gather basic data for analytics	What do we need to know to progress reform? (eg. AMI		X							NEL / ENA / Shareholders
Define pathway	Prepare final strategic pricing plan (including target		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 (retailer + end-user)		X							NEL / ENA / Shareholders
- pricing trials to test ideas	Conduct in-market testing, examine impact on customer			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			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				X					NEL / ENA / Shareholders
Adopt risk management approach	Identify and manage risks to markets, customers, EDBs				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							X		NEL

15. Loss Factors to Apply for the Period 1 April 2022 – 31 March 2023

Loss Factors will remain unchanged for the year. An assessment was undertaken in December 2018 which has shown that both technical and non-technical losses remain unchanged in the range of 3.2% - 3.7%.

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

16. Compliance with Electricity (Low Fixed Charge Tariff Option for Domestic Consumers) Regulations 2004

Nelson Electricity Domestic Line Charge Comparison
to comply with Electricity (Low Fixed Charge Tariff Option for Domestic Consumers) Regulations 2004
Prices as at 1 April 2022

					Controlled 15 (2) (b) (i)			Night 15 (2) (b) (ii)			Uncontrolled Only			Uncontrolled Controlled and Night		
Load Group 1		No of ICP's	Type of Charge	Line Charge			Total			Total			Total			Total
Residential Low Fixed Charge (15kVA		4360														
1-Fixed	Fixed		cents/kVA/day	2.000	365	days	$109.50	365	days	$109.50	365	days	$109.50	365	days	$109.50
1-24hr	Anytime		cents/kWh	6.750	4800	kWh	$324.00	6000	kWh	$405.00	8000	kWh	$540.00	5120	kWh	$345.60
1-Water	Controlled (Hot Water)		cents/kWh	4.250	3200	kWh	$136.00							2240	kWh	$95.20
1-Night	Night Rate (11pm-7am)		cents/kWh	3.650				2000	kWh	$73.00				640	kWh	$23.36
							$569.50			**$587.50**			**$649.50**			**$573.66**
Load Group 2 (from 15kVA to 150kVA)				Line Charge			Total			Total			Total			Total
Residential and Business		4825														
2-Fixed	Fixed		cents/kVA/day	7.100	365	days	$388.73	365	days	$388.73	365	days	$388.73	365	days	$388.73
2-24hr	Anytime		cents/kWh	3.300	4800	kWh	$158.40	6000	kWh	$198.00	8000	kWh	$264.00	5120	kWh	$168.96
2-Water	Controlled (Hot Water)		cents/kWh	0.800	3200	kWh	$25.60							2240	kWh	$17.92
2-Night	Night Rate (11pm-7am)		cents/kWh	0.200				2000	kWh	$4.00				640	kWh	$128
							$572.73			**$590.73**			**$652.73**			**$576.89**

Load Group 1 is for domestic households with connection capacity of 15kVA only (Low Fixed Tariff Option)

Load Group 2 is available to all connections with capacity from 15kVA to 150kVA.

Load Group 1 & 2 All current domestic households have an assessed connection capacity of 15kVA.

Uncontrolled Controlled and Night assessment ratios based on average consumption of all ICP's with Uncontrolled 64%, Controlled 28% and Night meters 8%.

Conclusion

Low Fixed Charge Option complies

In all tariff configurations the General Tariff Option is higher in cost at the 8,000kWh level compared to Low Fixed Charge Option.