



LINE PRICING METHODOLOGY

OtagoNet Joint Venture Electricity Network

For prices applicable from 1 April 2020

TABLE OF CONTENTS

Glossary of Terms	2
Executive Summary.....	4
1 Introduction	6
2 Contextual information about OJV	7
3 Overview of OJV’s pricing	10
4 Customer Installation Categories	13
5 Customer Attributes	19
6 Electricity network Assets and Costs	23
7 Cost allocation.....	27
8 Application of the line charges	42
9 Other Matters	44
10 Electricity Authority Pricing Principles Comparison	48
11 Pricing Strategy	53
12 Electricity distribution information disclosure determination 2012 compliance	54
Appendix 1 – Schedule of Prices.....	56
Appendix 2: CPD kW Discount	64

GLOSSARY OF TERMS

After Diversity Maximum Demand (ADMD) is the customer's Maximum Demand after it has been adjusted by the Diversity Factor.

Anytime Maximum Demand (AMD) is the Maximum Demand of the customer measured at the customer's installation during any half hour period during the year.

Coincident Grid Maximum Demand is the average of the 100 demand measurements of the customer, which are coincident with the 100 highest demands, which occur on the Transpower grid in the lower South Island region during the assessment period 1 September to 31 August, which the Transpower Interconnection charges are based.

Contract Capacity is the capacity of a customer used for billing purposes. It is formalized by way of agreement and control can be by way of the ICP fusing or the Anytime Maximum Demand.

Customer refers to the person or body that is responsible for an electrical installation that is connected to OtagoNet's electricity network.

Distributed Generation or embedded generation is electricity generation that is connected directly to a distribution network.

Diversity Factor is the factor applied to a load or customer demand to allow for the use of electricity at different times. In theory, the sum of the customer Maximum Demands after the Diversity Factors have been applied should equal the Maximum Demand measured at the GXP.

Grid Exit Point (GXP) means the Grid Exit Point and is the connection point between the Transpower grid and the OtagoNet network

Group Customers include most customers with a Contract Capacity up to 150 kVA.

Half Hour Metering (HHM) describes the metering equipment that is capable of measuring electricity consumption on a half hour basis and when the half hour readings are used for billing purposes.

Individual Customers are in most cases commercial or industrial customers that have a Contract Capacity equal to or in excess of 150kVA.

Installation Control Point (ICP) is the point of connection between the OtagoNet network and the Retailer's customer.

Maximum Demand (MD) of a customer is the maximum demand of the customer that occurs throughout the specified Peak Period Energy time periods for each GXP or if that measurement is not available, it is based on the Contract Capacity.

Optimised Depreciated Replacement Cost (ODRC) relates to the network assets and is the current depreciated value of all the network assets based on an efficient network design using modern equivalent assets.

Retailers are the companies that generate and/or buy electricity and then sell this service to end use customers utilizing the local electricity network.

Time of Use (TOU) refers to meters that are capable of providing Anytime and Maximum Demand readings and Peak, Shoulder and Low Period Energy readings for billing purposes.

Transpower is the State-Owned Enterprise that owns the transmission network and delivers electricity to Electricity Distribution Businesses (EDBs).

EXECUTIVE SUMMARY

This pricing methodology document describes the approach used by OtagoNet Joint Venture (OJV) to set prices for the 12 months commencing 1 April 2020. It has been prepared to meet the requirements of the Commerce Commission's NZCC 22/2012 Electricity Distribution Information Disclosure Determination 1 October 2012. It also assesses OJV's methodology against the recently revised Distribution Pricing Principles that were issued by the Electricity Authority in 2019.

This 2020 pricing methodology does not vary significantly from the previous year, either in terms of the methodology used to determine the target revenue for customer groups and individual customers, or in terms of pricing structures used. The determination of target revenue for each customer group and individual larger customers is carried out using a detailed cost of supply model that links charges to cost drivers and allocates costs to customers based on network usage and capacity requirements.

For the period 1 April 2020 to 31 March 2021, OJV's target revenue is \$33.4 million, down from \$36m the previous year. On average, lines charges will decrease by 10.5%. Changes in charges for individual customers will vary according to their usage profiles.

The component of OJV's revenue that relates to transmission has decreased as a result of reductions in Transpower's charges. The component of revenue that relates to OJV's distribution network has also decreased significantly, driven by the Commerce Commission's reset of regulated revenues under the Price-Quality-Path, including a reduction in return on capital.

At 31 March 2019, the value of OJV's regulatory asset base was \$194.4 million. Over the next 5 years, OJV plans capital expenditure of approximately \$72.1million. Just under half of that (\$33.6 million) relates to asset replacement and renewal. A further \$29.4 million is planned for consumer connections, and \$3 million for upgrading assets that are at or approaching capacity and addressing expected growth. Distribution network assets where capacity is being approached include zone substations, subtransmission lines and some distribution and LV lines.

The way in which prices are structured is a tool that networks can use to signal times of day when networks are closest to capacity, allowing customers to choose whether to respond. Where customers are able to shift load and opt to do so (or allow the network to control a portion of load), those customers are rewarded with lower lines charges.

OJV's kWh pricing to residential and general connections already has some signalling of busy periods: Day/Night pricing signals that the network is least busy overnight; and pricing for the Lakeland network signals that winter is the peak season for electricity network usage. In addition, Lakeland pricing for general customers has a peak demand component. OJV is looking to refine Day/Night pricing signals, in particular, so that peak prices are targeted at a much narrower set of busy network periods (eg, during the morning and evening peak periods). Having pricing structures in place that signal peak periods may help defer distribution network investment, particularly in the context of possible future growth in electric vehicles.

Rapid urbanisation in the Frankton and Wakatipu basin means that the transmission infrastructure serving the area are in need of upgrades. While load control is currently used to manage GXP loads, price signals can also aid with deferring the point at which upgrades are triggered. Looking forward, potential growth from electric vehicles means that it is even more important to have peak price structures in place to effectively manage network loadings.

The prices that OJV sets are charged to electricity retailers. Electricity retailers determine how to package these charges together with the energy, metering and other retail costs when setting the retail prices that appear in consumers' power accounts. This means that OJV's pricing structures are not necessary reflected in retail prices. However, collaborative industry engagement has seen progress in the implementation of time-of-use pricing by retailers.

1 INTRODUCTION

This document explains the reasoning and calculations used in establishing OJV line charges which are payable by the Electricity Retailers (Retailers) and the revenue from which is required to operate and maintain the OJV electricity network.

Regulation requires OJV to:

- a. limit its line charge increases while maintaining the quality of supply; and
- b. disclose specific business information including this Line Pricing Methodology document.

In compliance with these regulations, OJV is issuing this document, which outlines the methodology it uses in establishing its line charges from 1 April 2020. This document also assesses OJV's pricing against the Electricity Authority's 2019 Distribution Pricing Principles.

In addition to the Electricity Authority's Pricing Principles, the Commerce Commission continues to have regulatory jurisdiction for pricing methodology disclosure as per section 53C (2) (c) of the Act. These requirements are set out in Clauses 2.4.1 to 2.4.5 of the Electricity Information Disclosure Determination 2012 (ID Determination), published by the Commerce Commission in October 2012. Compliance with the ID Determination is outlined in Section 12. Assessment against the Authority's Pricing Principles is discussed in Section 10.

There have been no material changes to OJV's pricing methodology since the previous methodology was published.

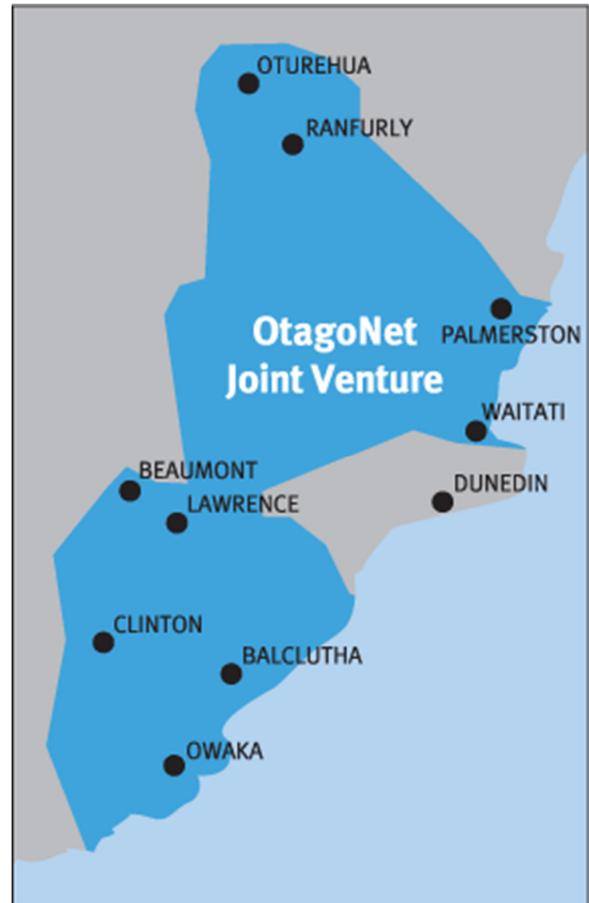
2 CONTEXTUAL INFORMATION ABOUT OJV

2.1 The OJV network

OJV owns the electricity distribution network in the lower southeastern part of the South Island (the Otago Region) and a small network in the Frankton area of Queenstown (the Lakeland network).

The Otago area covers 14,000 square kilometres and stretches from Owaka in the south through to Shag Point in the north and Lawrence in the west but excludes Dunedin city, Mosgiel and Port Chalmers. Through the 4,392 kilometres of lines, the Otago network delivers electricity to 14,963 homes and businesses and has the lowest density (customers per kilometre of line) of any electricity network in New Zealand. The topography of the terrain covered by the Otago region varies from rolling farmland and coastal bush covered hills to high altitude relatively arid plains. Corresponding variations in climate occur between onshore coastal winds to areas of freezing temperatures and heavy snow.

The Lakeland Region is a rapidly growing network in the Frankton area of Queenstown. The network consists of 19 kilometres of underground cable supplying a mix of 2,279 commercial and residential customers. Lakeland is supplied by the Transpower Frankton GXP and has one 23 MW zone substation.



Large consumers within OJV's network area include sheep, beef and dairy farming, extensive meat and dairy processing, forestry and timber processing and gold mining. Most of the large and small towns in the service area are rural service towns, except for Frankton which is a tourism service town.

OtagoNet's joint venture owners are EIL, and TPCL. OJV does not employ any staff and has outsourced its management of the electricity network distribution business to PowerNet Limited (PowerNet) which also manages the electricity networks owned by EIL and TPCL.

Electricity is delivered to OJV from Transpower's national grid through four GXPs located at Naseby, Half Way Bush, Balclutha and Frankton. The OJV distribution network also receives electricity from three Distributed Generators via stations located at Paerau (hydro), Falls Dam (hydro) and Mount Stuart (wind).

OJV does not buy and sell electricity; it delivers electricity to its customers on behalf of the electricity Retailers. Accordingly, OJV charges the Retailers at a wholesale level for this service, which includes Transpower's charges. The Retailers then pass on these charges to OJV's customers as part of their retail electricity charges.

2.2 Network investment

As at end March 2019, the value of OJV's network assets in its Regulatory Asset Base was \$194.4m. Over the next 5 years, OJV anticipates investing \$72.1 million in the network. \$33.6 million of that is related to asset replacement and renewals, \$29.4 million on consumer connections, and \$3 million on system growth.

As explained in the Asset Management Plan (AMP), assets that are at or approaching the point of triggering upgrades due to capacity requirements are:

- The Patearoa substation (and potential the Gimmerburn substation), due for replacement and upgrade, depending on the extent of irrigation growth
- Subtransmission lines, some of which are undersized for current capacity
- Some distribution lines and LV lines

Rapid urbanisation in the Frankton and Wakatipu basin means that the Transpower's GXP transformer and the 100 kV supply lines that serve the areas are in need of upgrades.

As is noted in the AMP, load control is utilised by OJV to manage:

- Transpower charges by controlling the network load during the LSI peaks.
- GXP load when maximum demand reaches the capacity of that GXP.
- Load on feeders during temporary arrangements to manage constraints.

2.3 Uptake of evolving technology

Solar (Photovoltaic) connections

As at end February 2019, OJV had 179 solar connections to its Otago network and 38 solar connections to its Lakeland network, equivalent to 1.2% of its Otago connections and 1.7% of all its Lakeland connections. These rates compare with the national uptake rate of 1.2%, though are well below the rates of 2.5-3% occurring in the highest uptake EDB areas.

The potential for growth in solar uptake and impact on the network is explored in the AMP, which finds that while reducing costs are likely to increase the number of households for which a solar installation is cost-neutral, solar uptake is not expected to be widespread on the OJV network within the planning period for a number of reasons, including that: (1) it appears that the majority of customers either cannot afford a solar installation, are unable to install solar (e.g. rental), or prefer to dispose of their income elsewhere; and (2) energy cost reduction options such as home insulation and electric vehicles now also receiving increased attention and generally offering a superior return.

The AMP finds that total energy consumption is likely to be reduced to some extent by solar installations within the AMP planning period. While energy consumption levels do not tend to affect network planning, which focuses on providing capacity for peak demand periods, it does affect price levels, to the extent that some component of price is set based on energy consumption (kWh). This is relevant to the development of our forward pricing strategy.

Electric vehicles

Although electric vehicle uptake is currently low, as is explained in our AMP, EVs have the potential to have large impact on network demand with sufficient adoption. This is especially the case where uptake is clustered.

Prices are an important means for signalling peak periods, and enabling EV users to choose whether to charge off-peak, or pay a premium and charge during peak periods. If consumers choose not to charge off-peak in response to price signals, electric vehicle charging may exacerbate peak demand, triggering greater investment. This effect will be greatest on the suburban LV network in built up urban and semi-urban areas as the upstream MV network generally has sufficient capacity to allow for the forecast increases in load from electric vehicles. As is explained in the AMP, the lower diversity on the LV network makes it both more likely that voltage issues will occur, and more difficult to predict in advance where those issues will occur.

Having pricing structures in place before EV uptake reaches widespread levels will enable a degree customer education before load shifting is required from a network capacity perspective. It will also allow networks to understand the effectiveness of price signals in managing EV loads before load capacity is reached.

Energy storage

As is explained in our AMP, energy storage could have a large impact on network demand especially if used in combination with distributed generation installations. However there is significant uncertainty in this area around the viability of alternative battery chemistries and the timing of their introduction; the regulatory environment and the extent to which electricity distribution businesses will be able to promote/utilise/market storage services; and the level of responsiveness of the public to load-driven pricing signals.

Under the status quo this technology is not economic except in exceptional circumstances, and it is not expected that there will be major developments in this area for the next five years. OJV has been engaged in pilot studies to explore how consumers may use energy storage to respond to price signals.

3 OVERVIEW OF OJV'S PRICING

The pricing methodology, described in this document, is designed to provide adequate revenue to recover OJV's costs including its cost of capital and depreciation.

Delivering electricity to the many customers around Otago requires a network of connected fixed assets, the investment in which is required to earn an economic return for the asset owners.

The required revenue is paid by the customers through the Retailers and it is important that the line charges paid by each customer are equitable and recover the capital, operation and maintenance costs of the network assets employed in the supply of electricity to the customer.

The line charges pricing structure seeks to allocate OJV's costs equitably across its customers and reflect the economic costs of delivering its services.

OJV also seeks to comply with all relevant regulations and guidelines with respect to the principles behind this methodology adopted in determining its line charges. The 2010 Electricity Authority's distribution Pricing Principles are shown in Section 11.

3.1 Signalling Economic Costs

OJV's pricing methodology is designed to ensure customers are paying the economic cost of the services provided by OJV. Basing the pricing and new connection fees on the Long Run Average Incremental Cost (LRAIC) of investment in the network ensures that future investments in the network are economically efficient and that the correct pricing signals are seen and accepted by the customers. The methodology results in line charges that are subsidy free insofar that they are based on and will be more than the LRAIC.

Values used in allocating the capital costs are based on the replacement values of the network assets. These replacement values are then adjusted by the ratio of the overall replacement cost to the ODRC of the network.

This means that all the network assets used in the calculation to supply a customer do not take into account the actual depreciated value of the specific assets but reflect the overall depreciated value of the network assets. All customers will then contribute to the renewal of the network based on the relative replacement value of the assets used to supply the customer.

OJV's pricing structures are designed to drive improved utilisation of network assets by sending strong signals to encourage long-term behavioural changes such as increased night-time usage.

3.2 Practical Considerations

Consideration was given to determining line charges for customers based on the cost of supply, being the locational based depreciated value of the actual assets used to supply customers. This approach was discounted on the basis it would be difficult to administer and could lead to issues surrounding asset renewals and because it is not practical to single out capacities below 150kVA for location based pricing.

The methodology while resulting in cross subsidisation between locations such as urban and rural groups results in robust stable line charges that recognises that consumers share the benefits of greater utilisation of shared assets.

The methodology involves offering strong price signals based on peak, off peak, day and night rates using fixed charges by capacity and variable charges for consumption and are easily understood. The prices are offered to all Retailers and provide a level playing field and the opportunity for retail competition.

The methodology maintains a balance between equitability of pricing for the customers and minimising transaction costs for the Retailers.

3.3 Return on Investment

OJV is owned by two joint venture parties who expect an appropriate commercial return from their investment.

These expectations are tempered by the Commerce Commissions Input Methodology Determinations based on the Commissions interpretations of Part 4 of the Acts DPP regime. This broadly restricts OJV to earning a substandard regulated return on its investment of 6.3% for the regulatory control period ended 31 March 2020, with subsequent resets for further five-year periods. Annual increases in regulated revenue are restricted to a calculation based on the CPI.

3.4 Equitability

Equitability is an important criterion in allocating existing network costs and signalling additional demand. This is countered by practicality and OJV has sought to establish a sensible and acceptable balance in the interests of its customers without over simplifying a complex reconciliation of several parameters that need to be taken into account in determining the cost of supplying electricity. These parameters include the power and energy used, the time it is used, the location it is used and the electricity network assets used to deliver the electricity to the location.

In pursuit of an optimal position, OJV has sought to split its customer base. The main split identifies those customers who are able to respond to pricing signals and where it is practical to allocate network assets to their supply as one group and another group, which is the majority of customers, where these considerations would be impractical.

3.5 Regulatory Constraints on Pricing Methodologies

The principle regulatory requirements that OJV operates within are the DPP set by the Commerce Commission under the Act, the Electricity Authority's 2010 Guidelines and the ID Determination promulgated by the Commerce Commission in October 2012.

However there are specific regulations and requirements that also influence OJV's line pricing methodology that exist contrary to these principle regulatory requirements that include:

- Low Fixed Charge Regulations that require we offer low fixed charge options that benefits consumers with annual consumption below 9,000kWh
- Rural and Non-Rural Pricing – changes to pricing differentials are restricted under section 113 of the Electricity Industry Act that ties price increases to rural customer to those of urban customers, which results in an EDB subsidising one group of customers. The subsidisation is

- offset somewhat by the provision of a different service level to urban customers due to a greater security level of electricity supply.
- The regulations for Distributed Generation which prevent charging for the use of assets shared with other groups of consumers effectively allowing free entry to the network apart from charging for incremental costs.

3.6 Overview of the Methodology

OJV's costs are predominantly based on its investment in fixed assets and hence are mainly fixed in the short term subject to any major natural events such as an earthquake.

The methodology divides the network assets for costing and charging purposes into two specific network asset groups, the sub transmission and distribution network assets. This separation facilitates investigations into alternative options to transmission extensions and the substitution of network expansion by other alternatives such as Distributed Generation or demand side management applications.

Ideally, the line charges should also be a predominantly fixed charge in the short term reflecting OJV's investment. Traditionally most metering and billing is based on the energy used by the customer that does not necessarily reflect OJV's costs in providing line services.

For the larger commercial and industrial customers new metering is enabling OJV to more accurately reflect its costs in its line charges.

Line charges for the larger commercial and industrial customers are adjusted annually to reflect the performance of the individual customer from the previous year. Agreements can be reached with the customers on forward projections to counter aberrations or growth.

For most of the larger customers there is also a variable monthly component dependent on the volume of electricity used. This mechanism, described later, is intended to share some of the risk between OJV and its customers.

The line charges relating to supplying domestic, small rural and urban customers have been averaged in recognition of the Electricity Industry Act, which indicates that any changes to urban and rural line charges should be consistent.

4 CUSTOMER INSTALLATION CATEGORIES

Installation categories are determined by OJV based on the level of service received by the customer and reflect groupings with distinct demand profiles and associated asset requirements.

There are two overarching customer categories used for calculating line charges.

The two categories are “Individual Customers” and “Residential & General Customers”.

The main distinguishing factor between the two categories is the size of the customer and the type of metering. These two factors relate to the impact of the customer on the network design and operation and secondly the cost of the metering relative to the line charges and the potential benefits the customer could obtain from network configuration and more accurate data.

4.1 Individual Customers (larger commercial, industrial)

In most cases these customers have a Contract Capacity equal to or in excess of 150kVA but smaller customers may be included if the customer believes there may be economic advantages such as a more favorable load profile than the corresponding Residential & General Customer class.

Line charges for this category are individually calculated and applied. They are based on meter readings that more accurately reflect the load profile of the customer.

It is considered that there is a higher probability that customers in this category may be able to respond individually to pricing signals, both at the time of connection and subsequently on a dynamic basis through varying their load profiles. They may also be more able to compare security of supply options and costs and then select their individual network configuration in considering the price/quality tradeoffs.

Due to their size, these customers have a higher impact on the network design and operation and therefore their geographical location in the network is taken into account when calculating their individual line charges. This also provides a signal for future investment and through the correct pricing discourages network by-pass.

Individually calculated or estimated loss factors are also applied to these customers. The application of these loss factors enables reconciliation of measured and calculated demands and energy across the network.

Individual factors considered in cost allocations to individual line charge customers include:

- Connections having dedicated transformers.
- Low percentage use of the low voltage network
- Low diversity as capacity and demand increases
- Customer owned transformers.
- Additional security and back supplies, n-1.
- Higher importance on network maintenance.

These customers have Half-Hour Metering (HHM). Customers with Half-Hour meters have line charges based on more precise load profiles, as meter readings for every half hour of the year are available.

These customers, through the Half-Hour metering, have individual profiles, which are used to calculate the line charges.

Metering of these customers includes kVA demand measurement which provides the seasonal Maximum Demand, the Anytime Peak Demand and in the case of Half-Hour metered customers the Coincident grid Maximum Demand.

The meter readings are also used in the calculation of line charges and to determine the Contract Capacity. For these customers, the Contract Capacity is based on the standard transformer size immediately above their Anytime Peak Demand or, alternatively, as per the original contract if growth is predicted and the network has been designed and built to supply the increased level.

Another advantage for a new Individual Customer is that some of the costs of connecting the customer to the network and any related network extension can be incorporated into the line charges in accordance with the terms of OJV's Capacity Guarantee Agreement.

Irrigation Customers

Irrigation customers are a sub group of the Individual Customers. An Irrigation customer's installation is used solely for pumping water commercially for irrigating farmland.

Irrigation operations vary from other customers insofar they all tend to operate at the same time, their demands are flat for extended periods but the operation is spasmodic depending on weather conditions.

Embedded Networks

An "Embedded network" is an electricity distribution network that is owned by someone other than OJV and is connected to OJV's network via a registered network supply point (NSP). The Embedded network must be metered with a compliant Half-Hour meter at the NSP. Due to the uncertain nature of electricity consumption in both irrigation customers and Embedded networks this sub group of customers will have their line charges calculated in the same way as Individual Customers but the total line charge will be recovered by an annual fixed charge only.

Otago Power Limited Legacy Customers

Some arrangements with customers in place were inherited from Otago Power Limited, as these contracts expire; they are being replaced with the methods described above.

4.2 Residential & General Customers (domestic, small commercial, farms etc.) - Otago Region

The Residential & General Customer category includes most customers with a Contract Capacity up to 150 kVA and is divided into different segments.

OJV charges the Retailers on a GXP metered billing basis; there is a fixed charge per ICP and a variable charge based on the energy metered at the GXP. Quantities attributed to each retailer are determined by the wholesale electricity market reconciliation process with adjustments for major customer quantities.

Residential & General Customers – Otago Region

Residential Installations

Residential customers are connected at a voltage of 400V and the connection is for the purpose of supplying electricity to premises that are used or intended for occupation principally as a place of residence. For all residential customers the supply capacity is rated at 10kVA.

In accordance with the legislation a low fixed charge option is available for permanent residential customers. OJV retained a standard domestic line charge so larger families would not be unnecessarily penalised by a higher variable energy component.

The Low Fixed Charge option is thus available for residential customers incorporating a fixed charge per day and daytime and nighttime rates for energy used in those periods.

General Customers

These connections are connected to the 400V system, generally with a fuse capacity of less than 150kVA, and are not a residential customer.

The size of the general connection is determined by the size of the service fuse or the rating of the distribution transformer. The supply capacity can be measured by demand half hour metering or portable logging equipment to measure the maximum average electrical demand over any half hour period. If the customer has contracted for a larger capacity due to predicted growth this will be the contract capacity. The minimum capacity is 10kVA.

These customers are charged at an annual fixed rate per kVA of their supply capacity and two variable charges based on their day time and night time energy usage.

Unmetered Loads up to 1 kVA

These are commercial connections of less than 1kVA capacity and are connected to the 400V system. Due to the small load on these connections, they are not required to be metered.

There is an annual fixed charge per year and the daytime and nighttime energy is calculated by the retailer.

Streetlights

Street lighting connections are used for the illumination of roadway and pedestrian areas, they are connected to separate circuits and controlled between the hours of dusk to dawn.

There is an annual fixed charge per lamp watt per year and daytime and nighttime energy rates.

Maximum Demand Customers – Withdrawn in 2015

This customer category has been withdrawn and is no longer available, all customers previously on this tariff are now on the individual customer's category and an individual line charge has been calculated for each one.

Residential & General Customers (domestic, small commercial, farms etc.) - Lakeland Region

The Group Customer category includes most customers with a Contract Capacity up to 276 kVA and is divided into different segments.

Residential Installations – Lakeland Region

A "Standard Residential" connection is one where the connection capacity is set according to the size of the network fuse provided for the short-circuit protection of consumers' mains. The default for a Standard Residential connection is a single phase 63 amp fuse providing a connection capacity of up to 15kVA.

A "low capacity" option is available, and is set by a single phase 32 amp fuse providing a connection capacity of up to 8kVA.

In order to be eligible for Standard Residential pricing, premises must comply with the definition of "home" given in the Electricity (Low Fixed Charge Option for Domestic Consumers) Regulations 2004. A residential consumer's "home" is their principle place of residence and, for the avoidance of doubt, excludes holiday homes. Also excluded are:

- a) penal institutions;
- b) hospitals, homes or other institutions for care of sick, aged or disabled;
- c) police barracks, cells and lock-ups;
- d) armed forces barracks;
- e) hostel, dormitory or similar accommodation;
- f) premises occupied by a club for provision of temporary accommodation;
- g) hotels, motels, boarding houses; and
- h) camping grounds, motor camps or marinas.

OJV charges the Retailers in the Lakeland region on an ICP metered billing basis for standard residential customers (i.e. price codes LD15, LM15 and LD08) costs are recovered through:

- fixed charges (per ICP); and
- kWh charges (based on periodic consumption).

This price structure for residential consumers is not the preferred recovery mechanism, but has been used in order to comply with Government Policy as to the level of fixed charges (as per the Electricity (Low Fixed Charge Tariff Option for Domestic Consumers) Regulations 2004). These regulations require domestic consumers using up to 9,000 kWh per annum to have, as an option, the fixed portion of their line charges limited to 15 cents per day. This has been applied to the recovery mechanism used for costs in these load groups.

This price structure nonetheless signals some of the peak demand cost drivers for these smaller domestic consumers, with the main weakness being that actual capacity costs are not recovered from consumers that use low kWh volumes.

Two components of line charges are used. The components are as follows:

Fixed Component

The fixed component has been set at 15 cents/day, which is the maximum fixed charge permitted under the Electricity (Low Fixed Charge Tariff Option for Domestic Consumers) Regulations 2004.

Variable Components

The variable components are defined by the existing metering arrangements. Most domestic connections have two meters – one to record general purpose consumption and one to record controlled water heating (minimum 16 hours service) consumption.

General Connections (Non-Domestic Connections and Non-Standard Residential

Connections including street lighting) – Lakeland Region

Two components of line charges are used. The components are as follows:

1. Fixed Charge

This charge recovers costs that are incurred on a connection basis and includes.

Assessed Capacity

LV Metered Connections

This charge recovers costs associated with the distribution system local to each connection point, i.e. LV lines and cables, distribution substations, and HV lines and cables. The use of these assets is more directly related to the capacity of the individual connections.

The basis for the annual Assessed Capacity is the minimum fuse size, mains size or standard distribution transformer size required to supply the maximum anytime power demand. Normally this will be the minimum fuse size for capacity up to 276 kVA.

HV Metered Connections

This charge recovers costs associated with the distribution system local to each connection point, i.e. HV lines and cables. The use of these assets is more directly related to the capacity of the individual connections.

The basis for the annual Assessed Capacity of HV metered connections, excluding residential secondary networks which are assessed on the basis of installed distribution transformer capacity, is the lesser of the installed distribution transformer capacity (kVA) and minimum standard transformer capacity greater than 1.18 times the average of the 12 highest anytime power demands (kVA). The factor of 1.18 is used so that the average ratio of maximum anytime power demand (kVA) to Assessed Capacity (kVA) for HV metered connections is the same as for LV metered connections.

kVA-km Charge

For the LT207 and LT276 load groups (assessed capacity 150 kVA or greater) the costs associated with HV lines and cables and sub transmission lines and cables are recovered by a kVA-km charge. The total kVA-km for each connection is the product of the connection capacity in kVA and the circuit distance from the distribution substation supplying the connection to the OJV zone substation and then to the nearest Transpower supply point.

This charge recognizes that additional investment in lines and cables is required to supply network connections that are a long way from Transpower supply points compared to those that are close to

a Transpower supply point. At more remote locations, alternatives to electricity may be more appropriate and this component signals this fact.

Control Period Demand Charge

This charge recovers costs associated with zone substations and sub transmission lines and cables, which are sized for system peak loads.

The basis for the Control Period Demand (CPD kW) is the energy used at the installation when OJV is managing demand. This energy usage will accumulate and at the end of the Control Period the accumulated energy is divided by the duration of the Control Period to obtain average power demand. If a consumer commences during the year a negotiated Control Period Demand will apply until a full winter is completed.

The Control Period Demand for each installation is set at 1 December to the average of CPD kW (Previous Winter) and chargeable CPD kW (at 1 December the previous year). The Control Period is likely to occur on cold winter days, anytime between 0700 hours and 2200 hours, and to last typically for two to three hours (but could last for up to ten hours on occasions) and is most likely to occur on approximately 20 to 50 days during the May to September period with most activity during June, July and August. Control periods will be signaled via ripple control and consumers may use this signal, via clean relay contacts, to operate a warning device to directly control deferrable load or to start up a standby generator, whichever is the most convenient.

Where it is not presently economic to install Control Period Demand metering for connections, then any charges that would normally be recovered via a Control Period Demand charge will be recovered via an Effective Control Period Demand charge based upon kWh consumption at the installation during Winter days (0700 hours - 2300 hours). This will be based upon the four months consumption reported by electricity retailers for the period May to August. Energy consumed by defined night loads is discounted by 100%. A list of discount rates for kWh usage on controlled rate registers is set out in Appendix 2.

The Effective Control Period Demand for each installation is set at 1 April to the average of CPD kW (Previous Winter) and chargeable CPD kW (at 1 April previous year). Thus, a strong economic signal exists for consumers to accept controlled loads. By signaling the impact of network coincident demand in this way, OJV is able to defer the need for investment in more capacity, which is a very expensive alternative. Consumers do not have to respond every time the signal is sent. Many will respond only when it suits, however the rewards for responding are substantial.

5 CUSTOMER ATTRIBUTES

Consideration was then given to the parameters to be taken into account in determining the line charge methodology. The capital invested in the network has to provide sufficient assets to meet the customers' requirements at any time during the year.

The customers' requirements will generally be in terms of meeting a specific customer load or demand and providing a specified quality of supply with respect to both reliability or security and voltage. Meeting these requirements is at a cost and whenever possible trade-offs are discussed or negotiated with new customers. At this stage, and when increased capacities are required, options considered and discussed will include demand side management and local generation.

To enable these options to be considered it is necessary to be able to analyse the various parameters that affect the required network investment and how these are related to the customer attributes.

These parameters and attributes have been considered at length and condensed down to the following list. All the attributes can be identified individually and their impact on the costs and subsequent line charges quantified. This can give customers a degree of choice when planning a new connection or increased capacity.

A reduction in the attributes to be factored into the line charges would increase the risk of cross-subsidisation between different customers. Further segmentation would create excessive complexity for minimal gain in accuracy. OJV continues to refine some of the arbitrary factors as more information becomes available.

The recovery of the OJV costs through the line charges takes into account the following customer attributes:

5.1 The geographical location of the customer

The location of a customer's connection will determine the size and length of cables or lines required to supply electricity to it. Considering this parameter can reduce cross subsidisation and provide pricing signals based on assets used.

The location is based on the radial distance from the zone substation from which the customer is normally supplied. The radial distance is used as it puts all Individual Customers on the same basis and eliminates variations in line routes and lengths due to historical or other reticulation issues. Natural barriers are taken into consideration when determining the radial distance.

A special factor may be applied to this radial distance if, for instance, the zone substation is not located at the optimum location relative to the current load centre due to historical reasons which no longer exist. A zone substation may have been located adjacent to an obsolete industrial site and it is not economic to relocate it closer to its current load centre, which might be a township.

The Individual Customer's share of the use of the "virtual line" will also be assessed based on the capacities or demands of other customers in that area that would be connected to that "virtual line".

5.2 The size of the customer's installation

This is known as the "Contract Capacity" kVA of the customer and is determined by either the size

- a) of the Installation Control Point (ICP) protective device, or
- b) as agreed and then measured by the metering as the "Anytime Maximum Demand" (AMD) which is the maximum power used by the customer in any 30 minute period during the year.

The size of the customer will determine the size and type of cables, lines and transformers required to supply electricity to it.

In the calculations this Contract Capacity is adjusted by a Diversity Factor (explained below) which allows for the net contribution of the customer to the investment required in network assets taking into account the varying demands of multiple customers sharing the use of those network assets at the time of the local distribution network maximum demand.

5.3 The power used by the customer in specified 30-minute periods when the network is delivering the maximum power

This is known as the "Maximum Demand" in kVA and is the maximum power used by the customer in any half hour between 0700 to 1100 hours and 1700 to 2100 hours each week day between May to September inclusive for customers supplied from the GXPs at Half Way Bush, Balclutha and Frankton and during the same hours between December to April for customers supplied from the GXP at Naseby.

The times when the network is delivering its maximum power from the Half Way Bush, Balclutha and Frankton GXP's occur during the winter months. The peak demand times during this period occur in the morning and evening when coincident domestic and commercial use is at its highest. The use of ripple control tends to flatten out the actual peak demands so the periods when the maximum demands occur extend to the two four hour periods each day.

On the Naseby GXP, the Maximum Demand daily times are the same but due to the increased power use by dairy farms and irrigation equipment the periods when the network is delivering its maximum power occur during the summer months.

The Maximum Demand of the customer, as opposed to the Contract Capacity is the more appropriate input to be used for measuring the contribution of the customer to both the investment in the sub transmission network and to Transpower's transmission charges. Many customers' installations can be oversized or the Anytime Maximum Demands may be outside the periods when the maximum power is being delivered through the network.

5.4 The quantity of energy used by the customer at specific times

- a) The “Peak Period Energy” (kWh) is the energy used between 0700 to 1100 hours and 1700 to 2100 hours, each week day between May and September inclusive for Installations supplied from Half Way Bush, Balclutha and Frankton and during the same hours between December and April for customers supplied from Naseby.
- b) The “Low Period Energy” (kWh) is the night time energy used between 2300 to 0700 hours each day.
- c) The “Shoulder Period Energy” (kWh) is the energy used at all other times.

The investment in the network and transmission network has to enable the maximum power to be delivered through the respective network assets. The energy used by a customer during the periods when the network is delivering its maximum power will also reflect the customer’s use of or contribution to the requirement for those assets. The combination of the customer’s Maximum Demand and the Peak Period Energy will reflect the customer’s share of the network investment and provide a strong pricing signal to the customer.

Conversely, the Low Period Energy contribution to the line charges is insignificant in comparison and encourages customers to shift load into the night-time period to better utilise the network assets and defer capital expenditure.

The contribution of the Shoulder Period Energy is the middle step between the times the network is close to or at its constraint limits and the times of low utilisation when significant spare capacity is available.

These three time zones for electricity consumption represent a balance between complexity and simplicity and better reflect the dynamic impact of a customer on the network costs.

The energy used is a measured quantity (kWh) at all metered connections. For the larger customers the measurement of energy can be recorded every half hour (HHM) or during specific periods (TOU) metering. Other smaller customer metering may be Day/Night or be customised for the Retailers’ tariffs.

5.5 The “Coincident Grid Maximum Demand” is also used for those customers with HHM

This is the average of the customer’s half hour demands occurring during the periods when Transpower’s 100 highest peaks for the lower South Island occur.

This input permits a more accurate determination of a customer’s contribution to the grid maximum demand.

5.6 Diversity Factor

The Diversity Factor applied to the measured Maximum Demand of each customer varies reflecting the assessed contribution of the different sized customers on the required capacity of the GXP and the OJV network. This is known as the After Diversity Maximum Demand (ADMD).

Larger customers have lower Diversity Factors as there are a smaller number of these customers and their impact on the GXP Peak Demand will be greater.

Measurements of diversity across domestic customers have been recorded for years using MDI's (Maximum Demand Indicators) at the local distribution transformers. The ADMD for domestic customers typically varies from 1kVA up to 10kVA depending on the size, age and location of the houses. An average of about 3kVA or a Diversity Factor of 20% has been used reflecting the increase in the number of heat pumps over the past few years.

For the OJV network these Diversity Factors for different sized customers are shown in Table 7-A.

Maximum Demand	Diversity Factor
Over 750kVA	95%
Over 105kVA and up to 750kVA	45% to 95%
Over 5kVA and up to 105kVA	17% to 45%
Unmetered Supplies up to 1kVA	100%
Streetlights	85%

Table 5-A Diversity Factors

The Diversity Factors are applied proportionately on an incremental basis between 5 and 750KVA.

As there is no documented methodology for the Group Customers the Diversity Factors are not used as the line charges are based on a rate per kVA of installed capacity.

5.7 Loss factors

The loss factor is the factor that is applied to demand and energy measurements taken at the customer's connection point to compensate for the losses in conveying the electricity across the network. In theory the sum of all the customer connection point measurements after the loss factors have been applied should equal the meter measurement at the zone substation or GXP.

Sub transmission and distribution network loss factors have been allocated to all the Individual Customers. The distribution loss factor includes an iron loss provision and a factor based on the radial distance from the zone substation. The sub transmission loss factors are based on calculated losses between the GXP's and the outgoing 11kV feeders at the zone substation.

The application of the loss factors to the Individual Customer meter readings provides a more accurate basis for allocating the costs between Individual and the Group Customers.

6 ELECTRICITY NETWORK ASSETS AND COSTS

Revenue Requirement for the Year Ended 31 March 2021

The following table lists the revenue allowances as per the Commerce Commission's Electricity Distribution Services Default Price-Quality Path Determination 2020.

The Determination is based on a variety of Input Methodologies that determines the inputs into the calculation of the Weighted Average Cost of Capital (WACC) used in the Commerce Commissions price reset calculations.

The inputs have concernedly resulted in lower price reset outcomes. The inputs include out of date market risk premiums and narrow time bands for calculations of interest costs used in the WACC calculation and in the reset calculation non-independent use of inflation assumptions from parties with vested interests in a mid-range inflation outcome.

Allowable Revenue is calculated based on various building block inputs including network operating expenditure (opex), non-network opex, a return of capital employed (depreciation), a return on capital employed (based on asset values and the WACC) and regulatory tax.

The use of inputs that are more current and independent results in a higher Allowable Revenue outcome than that calculated by the Commerce Commission as outlined in the table below.

Forecast allowable revenue RY21	
Term	Value (\$000)
Forecast net allowable revenue	25,779
Forecast pass through costs	335
Forecast recoverable costs	7,277
Opening wash-up account balance	-
Pass-through balance allowance	18
Total	33,409

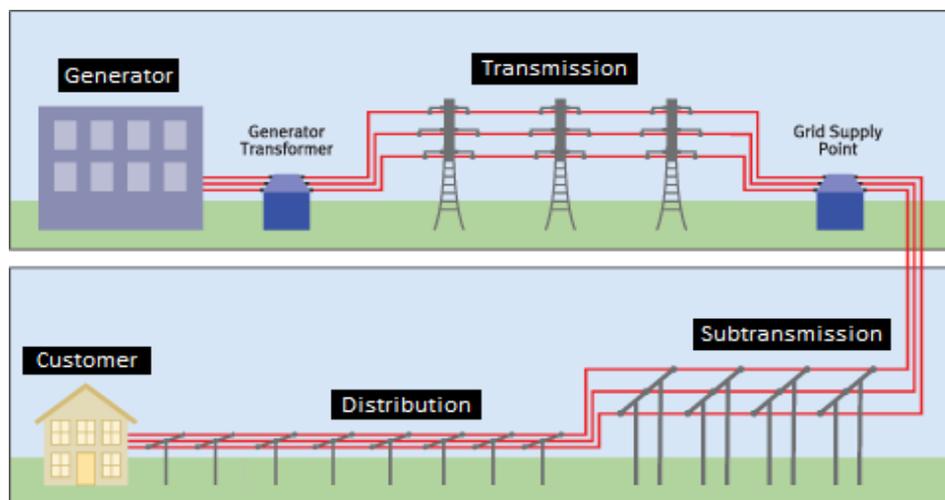
Pass-through costs are made up of:

Forecast Pass-through Costs RY21	
Forecast pass-through costs	₪ \$000
Rates on system fixed assets	152
Commerce Act levies	96
Electricity Authority levies	77
Utilities Disputes levies	10
Total forecast pass-through costs	335

Recoverable costs are made up of:

Forecast Recoverable Costs RY21	
Forecast recoverable costs	₪ \$000
IRIS incentive adjustment	(527)
Transpower transmission charges	6,374
New investment contract charges	220
Distributed generation allowance	1,259
Quality incentive adjustment	(71)
Fire and emergency NZ levies	22
Innovation project allowance	-
Total forecast recoverable costs	7,277

The OJV electricity network supplying the customers has distinctive categories of assets, outlined in the diagram below. The costs attributable from each of these assets can be individually identified to aid an equitable and more accurate allocation of costs.



The first part of the system is the Transpower grid **Transmission network** owned by Transpower and operating at 220kV or 110kV) which delivers electricity from the many generation stations around New Zealand to the connection points to the OJV network at Naseby, Half Way Bush and Balclutha. These connection points are known as Grid Exit Points (GXP).

The second part of the network is the **sub transmission network** which delivers the electricity “in bulk” to various townships, industries and areas around Otago. These lines transmit the electricity at either 66,000 or 33,000 volts and the lines are terminated at zone substations. These zone substations are typically just outside townships such as Owaka, Lawrence and Waitati.

The third part of the network is the **distribution network** which delivers the electricity to the distribution substations and then through the lines to the customers in homes and businesses. The lines to the distribution substations transmit electricity at 22,000 or 11,000 volts and the lines from the distribution substations to premises operate at 400 and 230 volts.

All the above segments make up the electricity network and their individual costs are recovered in accordance with the methodology described in this document.

The sub transmission network and distribution network costs are split into a “capital” component and a “maintenance” component reflecting the capital and maintenance costs respectively.

The “capital” component is based on the cost of capital and depreciation of the network assets and other ownership costs. This is not the net return on investment but the gross return before expenses and tax.

The “maintenance” component values are based on the equivalent values in the OJV business plan for the current year.

Network management costs which are directly associated with maintenance work are allocated to maintenance and added pro rata to the other direct field costs relating to the various groups of assets.

The network management costs that are not allocated to maintenance are allocated to administration.

Each customer's share of the use of the above assets and costs is then calculated. This is either on an individual customer basis or, in the case of the smaller Installations, on a group basis.

The objective is to reflect the share of the costs in a robust and equitable manner and the line charges to be structured so that the network investment and line charges are responsive to the individual customers' or customer groups' behaviour or pattern of usage.

7 COST ALLOCATION

7.1 Transmission Cost Allocation

Principles

Transpower's charges are based on recovering the costs of its necessary investment in the grid and the GXP's that is required to meet the maximum power delivered through them.

The component of Transpower's charges to recover its investment and operation costs of the four GXPs located at Naseby, Half Way Bush, Balclutha and Frankton is called the Connection Charge.

The Connection Charges incurred by OJV reflect Transpower's investment and operating costs which in turn reflect the maximum power conveyed through the GXP. OJV has purchased the connection assets of the Palmerston GXP and the 110,000V lines which run from Half Way Bush GXP in Dunedin to Palmerston, from Transpower. The connection charges that OJV has saved through this purchase are able to be recovered as avoided transmission investment for a period of five years, last year was the last of the 5-year period so this avoided transmission investment is no longer recovered through connection charges.

The second component of Transpower's charges is to recover Transpower's investment and operation of the main grid. They are known as the Interconnection Charges.

The Interconnection Charges incurred by OJV reflect OJV's actual load on its total network and its share of the load on the grid in the south of the South Island when that part of the grid is delivering the maximum power through it.

The third component of the transmission costs is the Avoided Transmission Charge(s) which is paid to a Distributed Generator to reflect its contribution to reducing the load on Transpower's grid and hence its Interconnection Charges to OJV. OJV is also able to recover these costs.

Loss Constraint Excess Payments are credits rebated by Transpower as a result of money received from the Clearing Manager for the Wholesale Electricity Market and are excluded from the Transmission Charges. The payments are part of OJV's revenue and are applied across the board to reduce the energy rates.

9.1.1. Connection Charges

As the Connection Charges are to recover the costs of the local assets at each of the GXPs, the allocation of these charges is mainly based on the ADMD of each customer. It is believed that this parameter is the most practical method of reflecting each customer's contribution to the requirement for Transpower's local GXP investment.

Projected peak demands on each individual GXP and energy delivered through these GXP's for 2020/21 with the charges are shown in Table 9-A.

GXP	Annual Connection Charges	GXP Peak kW Demand	Annual MWh	Rate per kW of GXP Peak Demand
Balclutha	\$901,765	27,364	153,082	\$32.95
Half Way Bush (including Avoided Transmission investment)	\$232,162	6,961	48,000	\$33.35
Naseby	\$547,353	27,693	196,127	\$19.77
Total or Average - Otago Region	\$1,681,280	62,018	397,209	\$27.11
Frankton – Lakeland Region	\$192,835	7,290	28,573	\$26.45

Table 7-A GXP Connection Charges and Profiles

The Connection Charge is based on the annual costs of the GXP.

The GXP peak demand is the maximum load on each individual GXP occurring during the twelve month period.

Although ideally the rate per kW of GXP peak demand should apply to all customers supplied from the specific GXP, in the case of the Otago region it was decided to apply the average rate to all existing customers.

The reasons for this are as follows:

- a. The large differences in rates,
- b. The location of existing customers is historical and some customers would be unduly penalised,
- c. The predominant load in the area (Oceana Gold's McRae's mine) has a relatively short predicted life at which time a GXP could be phased out.

The allocation of the Connection Charges is ideally based on the coincident demand for each customer during the period when the GXP peak demand occurs. For customers with half hour metering this is the case.

For non-half hour metered customers this half hour period cannot be predicted accurately and customers are unable to respond to dynamic real time pricing signals, the ADMD is used.

To mitigate against one off occurrences and provide a better reflection of the impact of the customer demand on the Connection Charges, the pricing methodology also takes into account the duration of the customer's power usage. This is achieved by allocating some of the Connection Charges to the Peak Period Energy volumes.

This in effect reduces the charges for a customer who incurs just one half hour peak during the whole peak period or is only impacting on the GXP peak demand period for a small part thereof and increases the charges for those customers which have a higher potential impact on the GXP peak demand periods.

It was decided to spread the allocation of the Connection Charges across the Shoulder and Low Period Energy as well, reflecting the availability and use of the GXP assets on a 24/7 basis. The rates for the Shoulder and Low Period Energy, although somewhat arbitrary, do provide a relatively strong signal to shift load out of the Peak Period Energy times.

For most customers the average rates per kW of GXP peak demand and average Peak, Shoulder and Low Period Energy rates per MWh will apply.

The Peak, Shoulder and Low Period Energy rates are based on the total MWh delivered through the GXP.

The allocation of the Connection Charges is thus as follows:

ADMD of the customer	40%
Peak Period Energy used by the customer	30%
Shoulder Period Energy used by the customer	20%
Low Period Energy used by the customer	10%

The sub transmission and distribution loss factors are applied to meter readings so that meter readings can be reconciled across the network and with the GXP meter readings.

Loss factors are applied to the GXP rates in Table 9-A and Table 9-B to produce the equivalent customer rates.

The peak demand and energy profile rates for the allocation of the Connection Charges are shown in Table 9-B.

GXP	GXP Peak Demand \$/kW	Peak Period Energy \$/mWh	Shoulder Period Energy \$/mWh	Low Period Energy \$/mWh
Balclutha	\$13.18	\$8.57	\$2.33	\$2.04
Half Way Bush	\$13.34	\$7.74	\$1.93	\$1.55
Naseby	\$7.91	\$5.30	\$1.09	\$0.85
Average –Otago Region	\$11.48	\$7.20	\$1.78	\$1.48
Frankton- - Lakeland	\$8.03	\$7.67	\$1.84	\$2.12

Table 7-B GXP Profiles

As stated above the average rates (with loss factors added) are applied to customers' ADMD and energy usage.

The total Connection Charges revenue from the Individual Customers is to be \$1,310,205 or 70% of the total Transpower Connection Charges.

One major customer accounts for approximately 36% of these costs.

9.1.2. Interconnection Charges

The Interconnection Charges are by definition demand based. The projected demands on each individual GXP when the electricity demand on the southern South Island grid is at its peak are shown in Table 9-C.

Included in the table are the Avoided Transmission Charges, which are paid to the embedded generators. Embedded generators at Paerau and Falls Dam are connected to the network supplied through the Naseby GXP and the Mt Stewart wind farm is connected through at the Balclutha GXP.

GXP	Annual Interconnection Charges	GXP Grid Coincident Peak Demand	Cost per kW of Grid Peak Demand
Balclutha	\$2,120,305	21,516	\$98.39
Half Way Bush	\$507,200	5,313	\$98.39
Naseby	\$1,510,090	14,711	\$98.39
Generation	\$1,258,998	12,576	\$98.39
Total or Average - Otago Region	\$5,396,593	54,116	\$98.39
Frankton – Lakeland Region	\$581,780	5,913	\$98.39

Table 7-C GXP Interconnection Charges and Profile

The allocation of the Interconnection Charges is ideally based on the coincident demands of the customers during the periods of grid maximum demand.

For Individual Customers without Time-of-Use meters the Interconnection Charges are based on the ADMD.

To mitigate against one off occurrences and provide a better reflection of the impact of the customer demand on the grid maximum demand, the pricing methodology also takes into account the duration of the customer’s demand. This is achieved by allocating some of the Interconnection Charges to the Peak, Shoulder and Low Period Energy volumes.

This in effect reduces the charges for a customer who incurs just one half hour peak during the whole grid maximum demand period or is only impacting on the grid maximum demand period for a small part thereof and increases the charges for those customers who have a higher potential impact on the grid maximum demand.

The Interconnection Charges for the non-TOU Individual Customers are based on a combination of the ADMD of the Individual Customer (50%), its Peak (30%), Shoulder (15%) and Low (5%) Energy consumed. All the rates are averaged across the customer base.

Table 9-D below shows the Interconnection Charges rates passed through to the Individual Customers.

	Coincident Demand Rate \$/kW	ADMD Rate \$/kVA	Peak Energy Rate \$/mWh	Shoulder Energy Rate \$/mWh	Low Energy Rate \$/mWh
Rates for all GXP's Otago region	\$98.39	\$49.20	\$18.86	\$5.35	\$2.18
Frankton GXP – Lakeland Region	\$98.39	\$49.20	\$25.41	\$7.30	\$4.21

Table 7-D Interconnection Charge Rates

For Individual Customers with Half Hour Metering the Interconnection Charges are based on the loading or demand of the customer coincident with the grid maximum demands. This is known as the Coincident Grid Maximum Demand. This is calculated after the event.

After the Connection and Interconnection Charges have been allocated to the Individual Customers, the remaining charges are then allocated across the Group Customers based on the respective Group Customer segment profiles.

All the charges are averaged so Group Customers bear the same average rates for the Connection and Interconnection Charges irrespective of their location and from which GXP they are supplied.

The total Interconnection Charges revenue from the Individual Customers is projected to be \$3,671,280 or 61% of the total Interconnection charges.

7.2 Sub transmission Cost Allocation

The sub transmission component of the line charges is based on the costs of the zone substation from which the customer is supplied.

The costs associated with the zone substations include their respective share of the costs of the 66,000 and 33,000 volt sub transmission lines connected directly or indirectly to the zone substation.

Each zone substation's respective share of the sub transmission line costs is determined using the "superposition" theorem to calculate the load flows through the network. The load flow analysis then enables the costs of each section of the sub transmission network to be allocated to one or more zone substations.

Replacement modern equivalent installed costs of the sub transmission lines and zone substations are the basis of the annual costs attributed to the assets.

The modern equivalent replacement value of the sub transmission line segments for the Otago region is \$33,135,995. The total annual revenue required from these assets by the owners is \$2,896,889 the Otago region and \$382,790 in the Lakeland region.

This annual revenue requirement was then allocated to the zone substations according to the load flow calculations outlined above.

The modern equivalent replacement value of the zone substations for the Otago region is \$31,324,000 and \$3,386,836 for the Lakeland region. The total annual revenue required from these assets by the owners is \$2,575,012 for Otago and \$924,959 for Lakeland. The sub transmission lines maintenance budget of \$309,143 in Otago and \$22,743 in Lakeland is allocated across the line segments based on

the length of each line segment. These maintenance figures are then allocated across the zone substations in accordance with the load flow methodology referred to above. The zone substation maintenance budget of \$875,904 for Otago and \$61,402 for Lakeland is allocated across the zone substations based on a weighting proportional to the relative size of the substation.

Table 9-E shows the annual costs of the sub transmission lines and zone substations allocated to each zone substation.

Three zone substations either have none or a minimal number of customers supplied directly from them and their main purpose is as part of the sub transmission network configuration.

Zone Substation	Total Annual Cost per Zone Substation
Charlotte	\$159,853
Clarks	\$182,372
Clinton	\$222,250
Clydevale	\$235,853
Deepdell	\$78,099
Elderlee St	\$317,519
Falls Dam	\$63,392
Finegand	\$118,946
Glenore	\$86,624
Golden Point	\$192,843
Greenfields	\$172,822
Hindon	\$242,158
Hyde	\$98,640
Kaitangata	\$140,382
Lawrence	\$520,301
Macraes Mine	\$196,262
Mahinerangi	\$135,937
Merton	\$301,137
Middlemarch	\$246,509
Milburn	\$247,153
North Balclutha	\$110,749
Oturehua	\$70,298
Owaka	\$241,531
Paerau	\$216,842
Paerau Hydro	\$499,400
Palmerston	\$246,727
Patearoa	\$134,465
Port Molyneux	\$111,672
PPCS	\$113,332
Pukeawa	\$71,237
Ranfurly	\$140,434
Stirling	\$108,800
Waihola	\$159,355
Waipiata	\$91,777
Waitati	\$271,124
Wedderburn	\$109,556
Totals	\$6,656,530
Remarkables	\$1,391,894

Table 7-E Sub Transmission Annual Costs

For the Individual Customers, the sub transmission component of the line charges is based on the ADMD of the customer.

Similar to the transmission charges, to mitigate against one off occurrences and provide a better reflection of the impact of the customer load on the sub transmission costs, the pricing methodology also takes into account the duration that the load of the customer impacts on the peak loading hours of the network. This is achieved by allocating some of the sub transmission costs to the Peak, Shoulder and Low Period Energy volumes.

This in effect reduces the charges for a customer that incurs just one half hour peak for the whole peak period or is only impacting on the peak hours for part of the peak period and increases the charges for those customers that have a higher potential impact on the peaks.

The annual cost of each zone substation is then allocated across the maximum demand, Peak, Shoulder and Low Period volumes of energy as shown below with the rates shown in

Table 9-F:

Peak Demand	25%
Peak Period Energy	25%
Shoulder Period Energy	40%
Low Period Energy	10%

Zone Substation	Sub transmission Profile Rates			
	Subtrans \$ per kVA	Subtrans \$ per Peak mWh	Subtrans \$ per Shoulder mWh	Subtrans \$ per Low mWh
Charlotte	\$8	\$10	\$6	\$3
Clarks	\$166	\$196	\$103	\$48
Clinton	\$27	\$40	\$16	\$10
Clydevale	\$16	\$55	\$16	\$10
Deepdell	\$102	\$315	\$122	\$75
Elderlee St	\$18	\$24	\$12	\$7
Falls Dam	\$12	\$12	\$5	\$2
Finegand	\$26	\$39	\$18	\$10
Glenore	\$28	\$56	\$23	\$13
Golden Point	\$15	\$24	\$6	\$3
Greenfields	\$22.55	\$39.09	\$10.69	\$4.58
Hindon	\$320	\$492	\$189	\$87
Hyde	\$32	\$64	\$25	\$11
Kaitangata	\$28	\$37	\$17	\$8

Zone Substation	Sub transmission Profile Rates			
	Subtrans \$ per kVA	Subtrans \$ per Peak mWh	Subtrans \$ per Shoulder mWh	Subtrans \$ per Low mWh
Lawrence	\$107	\$133	\$66	\$35
Macraes Mine	\$1.90	\$3	\$1	\$0
Mahinerangi	\$850	\$1,125	\$494	\$216
Merton	\$30	\$44	\$16	\$9
Middlemarch	\$75	\$132	\$57	\$30
Milburn	\$22	\$61	\$25	\$18
North Balclutha	\$10	\$13	\$7	\$3
Oturehua	\$132	\$193	\$89	\$44
Owaka	\$41	\$56	\$26	\$15
Paerau	\$178	\$441	\$278	\$116
Palmerston	\$26	\$41	\$16	\$9
Patearoa	\$18	\$33	\$21	\$9
Port Molyneux	\$43	\$69	\$31	\$16
PPCS	\$4	\$9	\$3	\$1
Pukeawa	\$37	\$131	\$52	\$31
Ranfurly 33kV	\$18	\$24	\$10	\$6
Stirling	\$7	\$22	\$4	\$2
Waihola	\$35	\$45	\$26	\$15
Waipiata	\$15	\$35	\$19	\$9
Waitati	\$43	\$81	\$31	\$18
Wedderburn	\$160	\$254	\$123	\$64
Remarkables	\$34.80	\$34.80	\$4.54	\$3.16

Table 7-F Sub transmission Profile Rates

The ADMD, the Peak, Shoulder and Low Period Energy of each Individual Customer are then adjusted by the respective loss factors to determine the Individual Customer's sub transmission annual charge.

After the sub transmission costs have been allocated to the Individual Customers the remaining costs are then allocated across the Group Customers

The respective sub transmission revenues from the Individual and Residential & General Customers are as follows:

	Otago	Lakeland
Individual Customers	\$1,784,562	\$189,016
Residential & General	\$4,872,386	\$1,202,075
Total	\$6,656,948	\$1,391,091

The significant difference in the share of the transmission and sub transmission costs between the two main categories, Individual and Residential & General Customers is due to one major customer.

The 66kV sub transmission line and zone substation supplying this customer have minimal capital and maintenance costs incorporated in the line charges as the capital costs were paid by the customer under a separate agreement and the owner is invoiced directly for all maintenance carried out on the 66kV line and zone substation.

As stated in Section 8, the size of this customer has a major impact on the allocation of OJV's pass through of Transpower's transmission charges.

7.3 Distribution Cost Allocation

The distribution costs are the annual capital and operating costs of the 11kV, 400V networks, distribution substations and transformers.

The distribution component of the line charges is split into two subcomponents, the annual costs of the lines and/or cables that are connected to the customer and secondly the annual costs of the local distribution substation or transformer.

9.3.1 Distribution Line Charge Component

An annual capital and maintenance cost per urban and rural km of line is calculated and used to determine the location costs of the Individual Customers.

Table 9-G shows the annual costs of the distribution lines. The cost per km of urban lines is higher than the rural lines, reflecting the closer spacing of poles, the larger conductor sizes and the inclusion of the 400-volt lines. The rural lines tend to have longer spans, lighter conductors, minimal amount of 400-volt lines and utilise SWER (Single Wire Earth Return) technology which reduces the cost per km.

For Individual Customers the location of the customer is taken into consideration in determining the former's share of the distribution line charge component.

The location is determined by measuring the radial distance from the nearest zone substation to the customer or local distribution transformer from which the customer is supplied. Any natural structures that would prohibit a cost effective supply are bypassed effectively increasing the radial distance.

The maximum demand of the Individual Customer is then compared to the maximum load on the 11kV distribution line ("feeder") supplying the customer and area. This ratio is then used to calculate the Individual Customer's share of the feeder.

The annual distribution line charge for the Individual Customer is its share, based on the above ratio, of the annual cost of the length of line supplying the customer.

Annual Distribution Line Costs	Otago	Lakeland
Distribution Line Urban annual costs	\$901,372	\$627,134
Line Length Urban km (11kV)	120km	10km
Cost per km of urban line (11kV and 400V)	\$7,511	\$5.23/kVA/km
Distribution Line Rural annual costs	\$11,338,068	
Line Length Rural km (11kV)	3000km	
Cost per km of rural line (11kV and 400V)	\$3,779	

Table 7-G Annual Distribution Line Costs

In calculating the distribution maintenance charges an allowance is made for the fact that customers above 150kVA have less use of the 400V network than smaller customers, i.e. they often have their own local transformer or exclusive supply cables from a transformer. The line portion of the distribution charges is multiplied by a factor of 70%.

For the Residential & General Customers the remaining distribution Line costs are allocated on an average basis using the same methodology as described above for the sub transmission charges.

9.3.2 Distribution Transformer Component

Annual capital and maintenance costs have been calculated for the distribution transformers dependent on their size.

Table 9-H shows the number and capacity of distribution transformers owned by OJV and connected to the network.

The annual cost per transformer is dependent on its size or kVA rating so the capital cost has two subcomponents, one being a fixed cost per transformer (22.5%) and the other cost (67.5%) based on the kVA capacity.

The total annual capital cost to be recovered is \$2,092,198 in the Otago region and \$112,433 in the Lakeland region. The distribution transformers maintenance costs to be recovered in the Otago region are \$257,619 and \$19,002 for Lakeland.

For Individual Customers the transformer costs are charged on an individual basis depending on transformer size and use i.e. whether it is for the exclusive use of the customer or it also supplies other customers.

Distribution Transformers and Capacity				
Description	Capacity	Number	Total Capacity	Annual Cost per Transformer
Transformer 15kVA	15	2839	42,585	\$434.68
Transformer 30kVA	30	588	17,640	\$502.61
Transformer 50kVA	50	364	18,200	\$593.18
Transformer 75kVA	75	31	2,325	\$706.39
Transformer 100kVA	100	121	12,100	\$909.61
Transformer 150kVA	150	0	0	\$1,136.03
Transformer 200kVA	200	99	19,800	\$1,362.46
Transformer 300kVA	300	72	21,600	\$1,815.32
Transformer 500kVA	500	48	24,000	\$2,721.03
Transformer 750kVA	750	12	9,000	\$3,853.17
Transformer 1,000kVA	1,000	6	6,000	\$4,985.32
Transformer 1,250kVA	1,250	0	0	\$6,117.46
Transformer 1,500kVA	1,500	0	0	\$7,249.60
Total		4,180	173,250	

Table 7-H Distribution Transformers

7.4 Overhead Cost Allocation

Overhead cost is those costs, which cannot be allocated directly to either capital or maintenance.

These costs include the following:

- (a) Executive Management
- (b) Directors Fees
- (c) System Control
- (d) Miscellaneous overheads, e.g. buildings, etc.

The annual OJV overhead costs are allocated equally across all customers.

The charge per customer is \$138.62 per year in the Otago region and \$135.21 in the Lakeland region.

7.5 Pass-through costs

Pass-through costs are costs relating to rates on network fixed assets charged to OJV by local authorities and industry levies imposed by the Commerce Act, the Electricity Authority and the Electricity Gas Complaints Commissioner Scheme and the Pass-Through Balance from the previous year.

The total estimated Pass-through costs for 2020 -21 are -\$353,337 in the Otago region and \$8,801 in the Lakeland region

Pass-through costs are recovered by -\$23.26 per ICP in the Otago region and \$3.70 per ICP in the Lakeland region.

7.6 Recoverable Costs

Recoverable costs recover 3 components

1. IRIS incentive adjustment – an additional recoverable cost has been allocated to OJV due to the amount of opex and capex completed over the previous regulatory control period. For the 2020-21 year OJV will under recover \$526,700.
2. Quality Incentive Scheme – an adjustment either positive or negative is allocated to OJV based on the previous years' performance against the networks target SAIDIs and SAFIs, for the 2020-21 year this adjustment is -\$70,730.
3. Fire Emergency New Zealand is a new recoverable cost introduced by the Commission to allow future increases and decreases to be shared with customers. For the 2020 -21 year the allowance is \$21,782

The total recoverable costs amounts to (-\$575,648) this is allocated to the customer groups on the same methodology basis as the supply costs of the sub-transmission and distribution costs outlined in section 9.2 & 9.3 above.

7.7 Target Revenue Requirement Summary

Below is a summary of our projected revenue for both Transmission costs, Distribution price components and Pass-through and recoverable costs broken down by the two customer group categories for the 2020 -21 year. We also outline the change in revenue compared with the previous year:

Otago Region Year 2020-21	Group Customers	Individual	Total
Distribution	\$21,003,452	\$2,348,284	\$23,351,736
Transmission	\$2,342,644	\$4,735,711	\$7,078,355
Pass-through costs	\$350,918	\$2,419	\$353,337
Recoverable costs	-\$512,414	-\$63,234	-\$575,648
Total	\$23,184,600	\$7,023,180	\$30,207,780
Lakeland Region Year 2020-21			
Distribution	\$2,131,330	\$295,934	\$2,427,264
Transmission	\$528,359	\$246,256	\$774,615
Pass-through costs	\$8,753	\$48	\$8,801
Total	\$2,668,442	\$542,238	\$3,210,680

Otago Region Year 2019-20	Group Customers	Individual	Total
Distribution	\$23,241,685	\$2,522,428	\$25,764,113
Transmission	\$2,897,404	\$5,005,223	\$7,902,627
Pass-through costs	-\$818,869	-\$5,534	-\$824,403
Recoverable costs	\$1,184,700	\$141,995	\$1,326,695
Total	\$26,504,920	\$7,664,112	\$34,169,032
Lakeland Region Year 2019-20			
Distribution	\$740,707	\$233,178	\$973,885
Transmission	\$493,354	\$309,915	\$803,270
Pass-through costs	\$6,802	\$41	\$6,843
Total	\$1,240,863	\$543,134	\$1,783,998

2020-21 is the first year of a five-year reset period under the Commerce Commission's Default Price-Quality Path. Under this regulation, OJV is allowed to increase its distribution charges by CPI. Other factors that impact on the allocation of costs relate to changes to chargeable quantities and individual customers profile changes along with contractual changes.

Transmission changes relate to a decrease in Transpower's interconnection charge rate of 10% and a 16% reduction in connection charges

8 APPLICATION OF THE LINE CHARGES

The line charges paid to OJV by the Retailers are based on a fixed charge per ICP and a rate per kWh of Day time Energy and a rate per kWh of Night Energy as measured at the GXP's for the Otago region and at the customers ICP in the Lakeland region.

The ratio of fixed charges per ICP to the variable energy charges is arbitrary as the line charge calculation produces an annualised fixed charge based on the various parameters referred to previously.

8.1 Individual Customers

Line charges for a customer are derived from the costs allocated based on the value of the network assets required to supply the maximum demand of the customer and are independent of the quantity of energy delivered.

Instead of Individual Customers paying a fixed amount each year, the decision was made to apply the derived annual line charge on a "fixed and variable (energy)" basis.

The application of the fixed and variable charges is not based on the derivation of the line charge but is an application of the calculated line charge to the Retailers to pass on to the Individual Customers.

The variable charge component is based on day time energy usage, i.e. between 07:00 and 23:00 hours. Hence, night time consumption does not contribute directly to the line charge account.

The calculated Individual Customer line charge is split 50:50 between a fixed and variable charge.

The objectives of applying the line charges on a fixed and variable basis are as follows:

- a) It is a means whereby OJV can share the risk of climatic variations and be responsive to changes in the local economy. It has been well received in the commercial market that when a customer has a production downturn or invests in energy conservation measures, there is an immediate response through a reduction in the variable charges.
- b) Customers also have the opportunity to shift load to night time to receive immediate benefits.
- c) If an Individual Customer is expanding the business with consequent increases in energy consumption, the variable charge means that OJV receives some immediate extra revenue and it can also cushion the increase in line charges for the following year.

Due to the uncertain and variable consumption levels of some customers including irrigation supplies and embedded networks, the line charges for these customers are recovered by a 100% fixed line charge.

The following tables provide examples how the consumption profiles and other customer parameters of three customers are applied in the calculation of their line charges.

Three typical Individual Customer electricity consumption profile parameters are shown in Table 10-A.

ICP Number	Contract Capacity kVA	Maximum Demand kVA	Total Energy mwah	Peak Period Energy mwah	Shoulder Period Energy mwah	Low Period Energy mwah
0001230990TG51A	500	389	890	169	500	221
0001230785TG4F3	200	93	275	41	162	73
0001231172TGE88	750	591	2,465	361	1,496	608

Table 8-A Individual Customer Energy Profiles

Other Individual Customer parameters used in the line charges calculation are shown in Table 10-B.

ICP Number	Diversity Factor	Grid Peak Coincident Demand kVA	Loss Factor Sub trans %	Loss Factor Diction %	Radial Distance from Zone Sub km	Share of 11kV Feeder %
0001230990TG51A	0.67	151	5.1	3.4	11.8	12.42
0001230785TG4F3	0.38	42	3.2	1.6	2.9	3.06
0001231172TGE88	0.81	323	3.2	3.2	11.2	36.66

Table 8-B Individual Customer Electrical and Physical Parameters

The calculated line charges for the three Individual Customers are shown in Table 10-C.

ICP Number	Transmission	Sub transmission	Distribution	Pass-through	Total Line Charge
0001230990TG51A	\$40,658	\$36,327	\$10,956	\$18	\$87,958
0001230785TG4F3	\$9,471	\$4,221	\$2,212	\$18	\$15,922
0001231172TGE88	\$70,710	\$40,648	\$32,587	\$18	\$143,963

Table 8-C Individual Customer Typical Line Charge Components

A table showing all the Individual Customer ICP line charges is in Appendix 1.

8.2 Residential & General Customers

After the line charges for the individual customers have been determined, the line charges for the Residential & General customers are calculated based on the remaining targeted revenue, which is recovered based upon the estimated consumption and capacities.

9 OTHER MATTERS

9.1 Non-Standard Contracts

OJV has a standard methodology for the determination of line charges for large customers, these line charges are charged to the customer via an interposed basis with the energy retailer.

In rare cases, the standard methodology may not fully recover the return and operating costs of the large capital expenditure required in supplying these customers. These customers may also have enhanced security arrangements. In the situations where customers have significant capital contributions, and new investment agreements, robust commercial contracts incorporating prudential requirements are prudent to mitigate the risk of these assets being stranded. These contracts can also assist in avoiding uneconomic by-pass of the network when negotiating commercial arrangements and encourage growth within the network.

OJV contracts directly with three ICP's for the line services provided to their large industrial sites. This is essentially because the value of the OJV-owned assets dedicated to the supply of these sites is significant (in the millions of dollars) and one customer has a limited operational life.

The manner in which the charges were set in these contracts reflect the term of the agreement, the incremental costs involved in supplying these customers, the customer owned assets, any additional maintenance costs and the use of upstream network assets consistent with the pricing methodology and pricing principles.

Line Services Interruptions

Customers on non-standard contracts can contract to have an N-1 security arrangement, this is where the customer has an alternative supply to their site from the substation should their normal supply route be interrupted, this can be an automatic or manual change over process. Should customers choose to have the additional security of supply, their line charges will reflect the additional cost.

Customers on non-standard contracts who have standard security arrangements are subject to the same restoration arrangements as customers on standard contracts.

Target revenue from ICP's on Non-standard contracts

The total target revenue from ICP's on Non-standard Contracts for the 2020/2021 year is \$3.431M.

9.2 Distributed Generation

OJV's line pricing methodology applies to Distributed Generation connected to the electricity network for high voltage capacities.

In certain situations it will be possible to connect Distributed Generation to the network downstream of the meter at a low capacity without modifications to the electricity network, in which case a standard off take Line Charge will be required to be paid to OJV.

In other situations there may be incremental costs incurred by OJV due to investigation and network modifications required. As with all customers seeking connection to the OJV electricity network where incremental costs are incurred an upfront capital contribution may be required to be paid.

For large capacity Distributed Generation options may exist to meet incremental costs either through payment of an upfront capital contribution and /or entering into a New Investment Agreement and / or Delivery Services Agreement with appropriate prudential security. A normal line charge will also apply according to the installation connection capacity of the Distributed Generators off take.

Financial Transactions with Distributed Generators

An application fee based on the capacity of connection is payable by the party making application to connect Distributed Generation to the network.

Financial transactions that can occur when Distributed Generation is connected to the OJV electricity network are:

Transaction Types	Capacity
Normal off take Line Charge (paid by the Distributed Generator to OtagoNet)	All capacities
Capital Contribution (paid by the Distributed Generator to OtagoNet)	All capacities where incremental costs are incurred by the network
New Investment Agreement charge (paid by the Distributed Generator to OtagoNet)	For capacities > 500kW
Recovery of High Voltage Direct Current (HVDC) Transmission Charges paid by the Distributed Generator to OtagoNet)	Where the Distributed Generation is injected into the Transmission Network
Avoided Transmission Charges (paid by OtagoNet to the Distributed Generator)	Where the Distributed Generation reduces Interconnection Charges at peak times

New Investment Agreement and / or Delivery Services Agreement Charges

New Investment Agreement and / or Delivery Services Agreement charges are negotiated with each customer and depend on factors including length of contract, asset lives, sunk costs, recoverable costs, maintenance costs, return on investment and prudential security provided.

HVDC Transmission Charges

HVDC Transmission Charges are recovered from Distributed Generators based on their share of the injection demand into the Transmission Network at the grid exit point they inject into.

Avoided Transmission Charge revenue

Avoided Transmission Charge revenue is allocated to Distributed Generators based on their generation demand injected into the network coincident with Transpower's top 100 demand peaks for the lower South Island, under the Electricity Authority Transmission Pricing Methodology (TPM), for the period 1 September to 31 August.

The Transpower interconnection charge is then applied over the period 1 April to 31 March. This lag can result in a one-year delay in the allocation of revenue to Distributed Generators.

The revenue paid to Distributed Generators is based on the annual interconnection rate set by Transpower under the TPM. The Avoided Transmission Charge revenue allocation to Distributed Generators is subject to change in the TPM.

Avoided Transmission Charge payments are only paid to Distributed Generators who the Electricity Authority determines are necessary to enable Transpower to meet the grid reliability standards under Schedule 6.4 of the Electricity Industry Participation Code (Code) or have a connection agreement with OtagoNet Joint Venture for such payments. Distributed Generators must also be submitting full half hour metered export consumption data to the network on a monthly basis to be eligible for payments.

Energy Reporting

Where distributed generation is connected to the distributor's network, kWh being exported onto the distributor's network must be submitted to the distributor.

The format the data is submitted must match the format of the ICPs other submitted data, e.g. either EIEP1 or EIEP3 format.

For clarity, export onto the distributor's network, and consumption off the distributor's network, are to be reported separately under the relevant price options (i.e. they should not be netted off).

9.3 Capital Contributions

Capital Contributions are calculated in accordance with OJV's published Capital Contribution policy.

9.4 Consumer Consultation

Where significant changes in pricing structure are considered, PowerNet consults with customers. While the pricing to apply 1 April 2020 does not involve any significant changes, PowerNet does anticipate consulting over the next 12 months on the potential to introduce Time-of-Use pricing.

OJV seeks the views of consumers as part of the Asset Management Process (AMP) and has reflected these views in section 1.6.5 of the published AMP.

The views were obtained via the following methods:

1. A bulk phone survey of current customers including expectations on price and quality
2. A face to face survey of with key clients including expectations on price and current service
3. Consultation meetings at various locations throughout the network
4. Individual consumers are consulted as they consider supply upgrades or new connections to the network.

The views are considered in preparation of the AMP.

Quality in the form of security of supply (n versus n-1), capacity (equipment loadings) both impact on the cost of supply and subsequently prices charged. Price is able to be varied through different payment options (such as capital contributions, line charges and new investment agreements) which

are discussed with large individual consumers as they consider supply upgrades or new connections to the network.

The Default Price Quality Path (DPQP) established regime has a tenuous link between price and quality. Costs and subsequently quality cannot be reduced by OJV without increasing the risk of a quality breach, and should OJV increase its operating costs to improve quality these cannot be recovered through increased prices due to operating expenditure building block allowances being set based on historic costs by the Commerce Commission when calculating the DPQP price resets.

10 ELECTRICITY AUTHORITY PRICING PRINCIPLES COMPARISON

The Electricity Authority has recently revised its distribution pricing principles and provided clarification of how the principles should be applied in practice.

The 2019 Distribution Pricing Principles:

- (a) Prices are to signal the economic costs of service provision, including by:
 - (i) being subsidy free (equal to or greater than avoidable costs, and less than or equal to standalone costs);
 - (ii) reflecting the impacts of network use on economic costs;
 - (iii) reflecting differences in network service provided to (or by) consumers; and
 - (iv) encouraging 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.
- (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
 - (ii) enable price/quality trade-offs.
- (d) Development of prices should be transparent and have regard to transaction costs, consumer impacts, and uptake incentives.

We have considered each of these principles in developing our line prices.

10.1 Prices are to signal the economic costs of service provision

By being subsidy-free (equal to or greater than avoidable costs, and less than or equal to standalone costs)

The PowerNet cost of supply model allocates costs to individual customers based on their geographical location, taking into account their share of the actual assets employed to supply them. Some existing charges for commercial and industrial customers do not have a structured methodology and are based on historic pricing. The remaining Group Customers have the resulting costs allocated to them on an averaged basis once the individual customers' costs have been deducted from the total costs. This methodology results in a cost allocation which is likely to recover revenue in between the stand-alone costs and the incremental cost of supply.

It is not easy to accurately establish the stand-alone costs for most customers supplied by a common service via a meshed network. However we can conclude that stand alone costs would be higher than average costs for those customers given the scale efficiencies in supplying them from a meshed network. PowerNet believes that the cost allocators used in the model are a representation of the underlying cost drivers of the business and therefore is subsidy free with regards to customer groups.

The methodology attempts to minimise cross subsidisation between the larger individual consumers and between consumer load groups.

New connections to the network pay a capital contribution if the expected revenue from the line charge does not cover the capital recovery cost required. This ensures that new connections are not subsidised and that total revenue from the new customer is not less than the expected incremental costs.

Reflecting the impacts of network use on economic costs

OJV's pricing structure uses capacity-based load groups to ensure prices have regard to the level of service capacity.

The day/night energy component of charges to residential and general customers for Otago customers provides a strong signal to consumers to utilise spare network capacity at night. Pricing for residential connections to the Lakeland network signals that winter is the season during which peak loadings are highest and provides reduced rates for controlled load. General connections to the Lakeland network are provided with peak control period demand pricing signals. These types of peak signals (kWh and demand) assist in deferring distribution and transmission network investments where network loadings are approaching capacity. Moreover, the potential for future developments such as electric vehicles, to bring network assets closer to capacity limits (especially on LV networks), means that a forward-looking approach to having structures in place and understanding/developing the responsiveness of customers to signals before they need to be relied upon has merit.

With regard to charges for individual customers, these are determined annually through a method which incorporates allocation of a portion of charges through peak demand measures. This is because the most significant cost driver that influences investment requirements in the network is the combined peak demand of all consumers in an area. PowerNet designs and constructs its network to meet this peak load. This ensures that prices signal the impact of additional demand on future investment costs. The use of a more sophisticated charging arrangement for individual customers reflects that they typically have greater capacity to manage and respond to demand-driven charges than smaller customers.

Reflecting differences in network service provided to (or by) consumers

By nature of ICP billing, the Lakeland network is able to have pricing that provides reduced differentiated prices for controlled load, reflecting that controlled load has different service availability than uncontrolled load. It provides multiple controlled load options to residential customers.

For individual customers, pricing reflects that different assets are used by different customers, which could also be associated with different service levels.

Encouraging efficient network alternatives

The locational specific pricing that is incorporated into Individual Customer charges assists in providing signals on the cost of network provision in particular locations that can then be compared against network alternatives to encourage efficient decision-making by consumers.

Signalling when the network is likely to be at its busiest or when capacity is available provides signals on when network alternatives can aid in meeting peak loads or in smoothing peaks through load shifting. There are a range of ways of providing these signals that incorporated in OJV's pricing (eg,

Day/night pricing in Otago and Controlled Period Demand pricing for General customers connected to the Lakeland network). It is envisaged that TOU pricing in the Otago network will allow more accurate signalling of network busy times than the broad day/night periods that are currently in use. For individual customers, charges reflect demand during peak periods which would encourage efficient decision-making on customer investment in and use of network alternatives.

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

OJV uses capacity charges to recover costs that are not recovered through peak demand charges or kWh charges. These types of charges would have less distortionary impacts in recovering sunk costs than kWh or demand charges would, but are arguably fairer than a single fixed charge for each and every ICP. However, there are limitations on the proportion of costs that can be recovered through capacity or daily charges as a result of the Low Fixed Charge Regulations, as well as fairness considerations.

OJV also notes that while the recovery of sunk or fixed costs from variable charges will distort usage to some extent, reasonably low uptake of evolving technologies (PV, EVs) for the foreseeable future likely means that there will be limited adverse consequences from variable charges.

Another interpretation of prices that least distort network use is Ramsey pricing, where those consumers with inelastic demand face higher charges as their consumption is least likely to be distorted as a result. However, this principle is difficult to apply as price elasticity information is difficult to obtain and it is likely the price elasticities will be different within each load group.

10.3 Prices should be responsive to the requirements and circumstances of end users by allowing negotiation to: (i) reflect the economic value of services; and (ii) enable price/quality trade-offs

As is discussed in section **Error! Reference source not found.**, in some cases non-standard prices and contracts are appropriate. This may be the case where, for example, a customer has enhanced security arrangements. In situations where customers have significant capital contributions or new investment agreements, robust commercial contracts incorporating prudential requirements are prudent to mitigate the risk of these assets being stranded. These contracts can also assist in avoiding uneconomic by-pass of the network when negotiating commercial arrangements and encourage growth within the network. OJV's individual pricing for large customers and individual account management to industrial and large commercial customers addresses the risk of bypass by negotiating arrangements that, as closely as is practical, reflect the network costs incurred by each individual consumer.

OJV's pricing model for large individual consumers ensures that the price is cost reflective and takes into consideration a distance factor from the customer's premises to the local zone substation, thus relating their line charges to the assets used for their supply. The closer to the zone substation the lower the distribution cost component. This component also allows for the shared use of those assets.

The pricing model allows customers to own their own distribution transformers passing on the savings made by ownership.

Each zone substation has individual costs allocated to it based on the substation assets and the share of the use of the sub transmission network as determined by load flow analysis. These individual zone substation costs are allocated to the individual consumers based on their respective load profiles and share of the use of the zone substation.

The use of individual capacity and demands also ensures that the price is cost reflective. By these processes, OJV discourages uneconomic bypass of its network and allows negotiation to tailor its services to the specific needs of the consumer.

During the consultation process with consumers, particularly the larger individual consumers, and often when they are extending or requiring a new supply, price/quality trade-offs are discussed and offered, these often in the form of offering the customer an (n-1) supply. Consumers who choose this level of supply will have the extra costs reflected in their individual line charge.

Each year PowerNet conducts a customer survey of 400 residential and commercial customers. Customers are asked if they would pay an extra \$10 per month in their line charge to reduce the number of outages they experienced each year, 82% stated no to this question.

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

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

OJV's new price structure for customers over 140kVA has been in place since 2002. The other pricing structures have been in place for years before 2002 and have only seen changes to tariff options in response to customer demand or legislative requirements such as the Electricity (Low Fixed Charge Tariff Option for Domestic Consumers) Regulations 2004.

Price levels for Individual Customers each year are based on the previous year's performance and projections for the current year following discussions with the owner when required.

More efficient use of electricity by these customers may be reflected at the time in the variable charges but will primarily be effective as the basis for calculating reduced line charges (in real terms) for the following year.

Once the line charges have been established by the methodology, the tariff structure is straight forward, limited to a fixed daily charge and variable consumption tariff for the majority of the larger customers.

The Electricity (Low Fixed Charge Tariff Option for Domestic Consumers) Regulations 2004 requiring a low fixed charge option for each domestic tariff has increased the number of options.

The issue is a compromise between simplicity and equitability of pricing. Three parameters influence the cost, the location of the premises to be supplied (governs the assets used), the load to be supplied (governs the size of assets used) and the time the load is supplied (governs the diversity and hence size and share of the assets used).

OJV's line charge methodology has endeavoured to incorporate these aspects and then apply in the most equitable but simple way practicable.

OJV uses "GXP billing" for its Group Customer connections in the Otago network (ie, excluding Lakeland). This is where variable consumption charges are based on electricity volumes injected into the network at the Transpower grid exit points. Quantities are determined by the wholesale electricity market reconciliation process, which is itself governed by an Industry Participation Code. This method saves on administration costs, which are transferred back into the pricing.

OJV also recognizes that "ICP pricing and billing" can send stronger price signals to customers but does constrain tariff innovation by the Retailers. The alternative is for a further breakdown of the GXP energy volumes into "peak" and "shoulder" rates or "congestion" and "non congestion" periods, which would be differentially charged to the retailers. This would sharpen the signal to the retailers and end use consumers.

OJV's pricing from 1 April 2020 does not incorporate structural changes and as a result, consumer impacts of the change in price levels are likely to be predictable. However, if OJV implements a significant change in pricing structures, such as TOU implementation or follows a government-led LFC transition, we would anticipate that consumer impact analysis would be much more relevant.

11 PRICING STRATEGY

Given that OJV's pricing to Individual Customers is highly cost reflective, the focus for future pricing changes is in the structure of pricing for residential and general customers, particularly in the Otago region. Two issues for further development are: (1) how to improve time-of-day signals regarding peak times on the network that are likely to drive future investment; and (2) how to reduce distortions from the recovery of sunk costs.

OJV has made significant progress on the first of these issues by examining TOU price implementation. PowerNet has engaged in significant workstreams to enable TOU pricing including: billing system changes; engagement with retailers seeking support and feedback on best practice to implementing a change to TOU and how the necessary data will be provided; and preparing TOU pricing models and analysis. We have introduced new loss codes to identify low user energy at a GXP level to aid the analysis. We intend to continue to develop TOU pricing, with the potential to implement for residential and general consumers from 1 April 2021. The change in consumers' lines charges as a result of TOU will depend on usage profiles, but generally TOU implementation will have the least bill impact of available price reform options.

Addressing the second issue is largely dependent on the government's implementation of a transition from the existing Low Fixed Charge (LFC) Regulations. The regulations limit fixed charges to 15c per day, which effectively means that for residential consumers with annual usage below 9000 kWh (which is the majority of OJV's residential connections) around 95% of revenue must be collected through variable charges. This means that variable charges are higher than is efficient and oversignal the network impacts of energy use. The Electricity Networks Association (ENA) has facilitated a collaborative exercise in examining other pricing options in the presence of the LFC. However, that exercise has found that alternative options involve significant challenges, risks and lead-in times. Moreover, indications from the Minister that the government is actively pursuing LFC reform lead us to conclude that at this stage the best course of action is to await the outcome of that reform.

12 ELECTRICITY DISTRIBUTION INFORMATION DISCLOSURE DETERMINATION 2012 COMPLIANCE

This section demonstrates compliance with the Commerce Commission’s Electricity Distribution Information Disclosure Determination – October 2012.

Clause:

2.4	Pricing and Related Information <i>Disclosure of pricing methodologies</i>
2.4.1	<p>Every EDB must publicly disclose, before the start of each disclosure year, a pricing methodology which-</p> <ul style="list-style-type: none"> (1) Describes the methodology, in accordance with clause 2.4.3 (Section 3) below, used to calculate the prices payable or to be payable; (2) Describes any changes in prices and target revenues; (Section 7.7) (3) Explains, in accordance with clause 2.4.5 below, the approach (Section 9) taken with respect to pricing in non-standard contracts and distributed generation (if any); (4) Explains whether, and if so how, the EDB has sought the views of (Section 9.4) consumers, including their expectations in terms of price and quality, and reflected those views in calculating the prices payable or to be payable. If the EDB has not sought the views of consumers, the reasons for not doing so must be disclosed.
2.4.2	<p>Any change in the pricing methodology or adoption of a different pricing methodology, must be publicly disclosed at least 20 working days before prices determined in accordance with the change or the different pricing methodology take effect. (n/a – no change in methodology)</p>
2.4.3	<p>Every disclosure under clause 2.4.1 above must -</p> <ul style="list-style-type: none"> (1) Include sufficient information and commentary to enable interested persons to understand how prices were set for each consumer group, including the assumptions and statistics used to determine prices for each consumer group (Section 7) (2) Demonstrate the extent to which the pricing methodology is consistent with the pricing principles and explain the reasons for any inconsistency between the pricing methodology and the pricing principles (Section 10) (3) State the target revenue expected to be collected for the disclosure year to which the pricing methodology applies (Section 6) (4) Where applicable, identify the key components of target revenue required to cover the costs and return on investment associated with the EDB’s provision of electricity lines services. Disclosure must include the numerical value of each of the components; (Section 6) (5) State the consumer groups for whom prices have been set, and describe- <ul style="list-style-type: none"> (a) the rationale for grouping consumers in this way; (Section 4)

	<p>(b) the method and the criteria used by the EDB to allocate consumers to each of the consumer groups; (Section 4)</p> <p>(6) If prices have changed from prices disclosed for the immediately preceding disclosure year, explain the reasons for changes, and quantify the difference in respect of each of those reasons; (Section 8, 7.7)</p>
2.4.3	<p>(7) Where applicable, describe the method used by the EDB to allocate the target revenue among consumer groups, including the numerical values of the target revenue allocated to each consumer group, and the rationale for allocating it in this way (Section 7 & 8)</p> <p>(8) State the proportion of target revenue (if applicable) that is collected through each price component as publicly disclosed under clause 2.4.18 (Sections 7 & 8)</p>
2.4.4	<p>Every disclosure under clause 2.4.1 above must, if the EDB has a pricing strategy -</p> <p>(1) Explain the pricing strategy for the next 5 disclosure years (or as close to 5 years as the pricing strategy allows), including the current disclosure year for which prices are set (Section 11)</p> <p>(2) Explain how and why prices for each consumer group are expected to change as a result of the pricing strategy (Section 11)</p> <p>(3) If the pricing strategy has changed from the preceding disclosure year, identify the changes and explain the reasons for the changes (Section 11)</p>
2.4.5	<p>Every disclosure under clause 2.4.1 above must -</p> <p>(1) Describe the approach to setting prices for non-standard contracts, including -</p> <p>(a) the extent of non-standard contract use, including the number of ICPs represented by non-standard contracts and the value of target revenue expected to be collected from consumers subject to non-standard contracts (Section 9)</p> <p>(b) how the EDB determines whether to use a non-standard contract, including any criteria used (Section 9)</p> <p>(c) any specific criteria or methodology used for determining prices for consumers subject to non-standard contracts and the extent to which these criteria or that methodology are consistent with the pricing principles (Section 9)</p> <p>(2) Describe the EDB's obligations and responsibilities (if any) to consumers subject to non-standard contracts in the event that the supply of electricity lines services to the consumer is interrupted. This description must explain -</p> <p>(a) the extent of the differences in the relevant terms between standard contracts and non-standard contracts (Section 9)</p> <p>(b) any implications of this approach for determining prices for consumers subject to non-standard contracts (Section 9)</p> <p>(3) Describe the EDB's approach to developing prices for electricity distribution services provided to consumers that own distributed generation, including any payments made by the EDB to the owner of any distributed generation, and including the -</p> <p>(a) prices; and (Section 9)</p> <p>(b) value, structure and rationale for any payments to the owner of the distributed generation (Section 9)</p>

APPENDIX 1 – SCHEDULE OF PRICES

OTPO - OtagoNet Joint Venture						
Delivery Price Schedule for Residential & General Connections						
Residential and General Connections	Code	Number of Consumers	Charges Effective from:	Pass Through Fixed Price \$/kVA/Day of supply capacity	Distribution Price \$/kVA/Day of supply capacity	Total Fixed Price \$/kVA/Day of supply capacity
Delivery Prices effective from 1 April 2020						
Fixed Prices per kVA of Supply Capacity						
Residential Standard - Fixed Price per kVA of Supply Capacity	1A	1755	1-Apr-20	\$0.015628	\$0.150487	\$0.166115
Residential Standard - Fixed Price per kVA of Supply Capacity	1B	4803	1-Apr-20	\$0.015628	\$0.150487	\$0.166115
General Connection Group - Fixed Price per kVA of Supply Capacity	2	3289	1-Apr-20	\$0.015660	\$0.150455	\$0.166115
				Pass Through Fixed Price \$ per Day	Distribution Price \$ per Day	Total Fixed Price \$ per Day
Fixed Prices per Day						
Residential Low Fixed Charge - Fixed Price	7	3773	1-Apr-20	\$ 0.0141	\$0.1353	\$0.1500
Residential Low Fixed Charge - Fixed Price	8	1223	1-Apr-20	\$ 0.0141	\$0.1353	\$0.1500
Unmetered Loads up to 1 kVA - Fixed Charge per connection	5	77	1-Apr-20	\$0.061800	\$0.535104	\$0.656904
				Pass Through Fixed Price \$ per 100 lamp watt per day	Distribution Price \$ per 100 lamp watt per day	Total Fixed Price \$ per 100 lamp watt per day
Streetlights						
Street Lights Fixed Price per 100 lamp watt	6	9	1-Apr-20	\$0.01562	\$0.111178	\$0.122740
				Pass Through Variable Price \$ per Day kWh	Distribution Price \$ per Day kWh	Total Variable Price \$ per Day kWh
Variable Volume Prices						
Day						
Variable Volume prices for codes 1A,1B, 2, 5, 6 metered at the GXP			1-Apr-20	\$ 0.01221	\$0.11728	\$0.12949
Variable Volume prices for codes 7 & 8 metered at the ICP			1-Apr-20	\$ 0.02052	\$0.13718	\$0.21770
				Pass Through Variable Price \$ per Night kWh	Distribution Price \$ per Night kWh	Total Variable Price \$ per Night kWh
Night						
Variable Volume prices for codes 1A,1B, 2, 5, 6 metered at the GXP			1-Apr-20	\$ 0.00140	\$0.01350	\$0.01490
Variable Volume prices for codes 7 & 8 metered at the ICP			1-Apr-20	\$ 0.002420	\$0.023245	\$0.025665

Residential definition - a residential consumer is where the consumer's metered point of connection to the network is for the purposes of supplying a home (the principle place of residence of the consumer), not normally used for any business activity and not used as a holiday home. Residential consumers may only change their price code once per 12 month period.

Volume Prices

The volume prices shown apply to the Day MWh Purchases as metered at the Transpower Grid Supply Point, except for codes 7 & 8 which are metered at the ICP. Day is defined as 0700 - 2300 hours.

Summer Day means the period of time from 07:00 until 23:00 on all days between the 1st of October and 30th of April.

Winter Day means the period of time from 07:00 until 23:00 on all days between the 1st of May and the 30th September.

Night means the period of time from 23:00 until 07:00 on all nights of the year.

Grid Exit Point means the Transpower substation that supplies the customer. The Retailer's energy for classes 1A, 1B, 2, 5 & 6 is calculated by subtracting the day and night kWh figures, plus losses, of the individual customers and Residential Low User Option from the Retailer's reconciled energy at each grid exit point.

Distributed Generation Export Variable Price

The volume prices apply to distributed generation exported into the distribution network and reported at the GXP, Code DG24 (refer to EIEP 12 for price component)

\$/kWh \$0.000

Supply Capacity kVA means the maximum average electrical demand over any half-hour period measured in kVA. This may be measured by half-hour demand metering or measured by portable logging equipment or assessed from nameplate ratings of connected equipment. The minimum capacity is 10kVA for all Residential and General connections.

With Off - Peak - The eligibility for a "with off peak" delivery price is determined on the basis that at least 25% of the total energy consumption is separately metered and controlled by a ripple relay, such as a water heater or consumed between 23:00 and 07:00 hours.

All prices are GST exclusive.

Line Losses:

All ICPs except for Individually assessed customers have a loss factor of 1.0750 code OTPOGXP, OTPOL1

Power Factor Charges

All charges assume a power factor of not less than 0.95 lagging.

Non-Domestic customers may have a data logger installed to assess their power factor. If a non-domestic customer has a power factor of less than 0.95 lagging and after a period of 12 months notice has not been corrected then an annual power factor charge of \$80 per kVA will be applied.

The kVA is based on the total kVA less kVA at 0.95 power factor. The kVA will be assessed on the average of the 12 highest kWh half hour periods during the assessment period.

Application of the power factor charge will be at the sole discretion of the Distributor.

Half Hour Metered Individual Line Charge Customers – Otago & Lakeland Region

ICP Number	Number of Consumers	Contract Capacity kVA	Charges effective from	Pass-through portion of Fixed Price per Day	Total Fixed Price per Day	Pass-through portion of Variable Price per Day kWh	Total Variable Price per Day kWh
Otago Region							
0001090833TG6F1	1	300	1-Apr-20	\$ 4.21	\$ 10.04	\$ 0.05366	\$ 0.12107
0001120438TGE4C	1	150	1-Apr-20	\$ 2.10	\$ 10.33	\$ -	\$ -
0001230615TG210	1	200	1-Apr-20	\$ 9.81	\$ 20.60	\$ 0.01362	\$ 0.02721
0001230783TG57C	1	1000	1-Apr-20	\$ 39.31	\$ 71.77	\$ 0.02221	\$ 0.03893
0001230785TG4F3	1	200	1-Apr-20	\$ 11.20	\$ 21.39	\$ 0.01804	\$ 0.03309
0001230940TG858	1	750	1-Apr-20	\$ 23.41	\$ 87.02	\$ 0.01810	\$ 0.05902
0001230990TG51A	1	500	1-Apr-20	\$ 26.42	\$ 62.98	\$ 0.02884	\$ 0.06423
0001231005TGF1B	1	2500	1-Apr-20	\$ 168.13	\$ 380.61	\$ 0.02077	\$ 0.04409
0001231172TGE88	1	750	1-Apr-20	\$ 86.34	\$ 202.78	\$ 0.01528	\$ 0.03352
0001250655TG2ED	1	30	1-Apr-20	\$ 3.72	\$ 11.19	\$ -	\$ -
0001320515TGD9E	1	75	1-Apr-20	\$ 3.55	\$ 6.69	\$ 0.03103	\$ 0.05692
0001321124TGB82	1	150	1-Apr-20	\$ 2.51	\$ 11.51	\$ -	\$ -
0001370505TG447	1	50	1-Apr-20	\$ 12.15	\$ 25.23	\$ -	\$ -
0001370610TG0A6	1	200	1-Apr-20	\$ 7.25	\$ 13.34	\$ 0.05166	\$ 0.09197
0001401195TG9B3	1	50	1-Apr-20	\$ 11.73	\$ 21.70	\$ -	\$ -
0001450225TGAD6	1	150	1-Apr-20	\$ 15.69	\$ 22.62	\$ 0.01404	\$ 0.01988
0001450400TGCCA	1	100	1-Apr-20	\$ 9.69	\$ 14.94	\$ 0.01217	\$ 0.01837
0001452050TGB83	1	100	1-Apr-20	\$ 7.57	\$ 11.58	\$ 0.01374	\$ 0.02064
0001491270TGA81	1	200	1-Apr-20	\$ 6.90	\$ 10.47	\$ 0.03168	\$ 0.04726
0001520870TGB4E	1	150	1-Apr-20	\$ 10.19	\$ 14.61	\$ 0.02509	\$ 0.03541
0001580380TGEBF	1	50	1-Apr-20	\$ 4.72	\$ 10.07	\$ 0.06762	\$ 0.13816
0001640675TGEE6	1	100	1-Apr-20	\$ 12.85	\$ 90.98	\$ -	\$ -
0001690827TGC31	1	500	1-Apr-20	\$ 1.50	\$ 10.71	\$ -	\$ -
0001700063TGC3B	1	1750	1-Apr-20	\$ 91.09	\$ 197.24	\$ -	\$ -
0001710106TGF61	1	150	1-Apr-20	\$ 4.66	\$ 45.23	\$ -	\$ -
0001710108TGCFA	1	150	1-Apr-20	\$ 7.04	\$ 77.55	\$ -	\$ -
0001730075TG635	1	200	1-Apr-20	\$ 4.89	\$ 17.79	\$ -	\$ -
0001730339TG48D	1	150	1-Apr-20	\$ 10.36	\$ 33.22	\$ -	\$ -
0001730798TGCD6	1	200	1-Apr-20	\$ 1.56	\$ 6.01	\$ -	\$ -
0001730830TG9D2	1	500	1-Apr-20	\$ 34.50	\$ 113.89	\$ -	\$ -
0001730881TG725	1	200	1-Apr-20	\$ 5.54	\$ 19.17	\$ -	\$ -
0001731161TG536	1	200	1-Apr-20	\$ 13.97	\$ 43.00	\$ -	\$ -
0001731175TGE91	1	200	1-Apr-20	\$ 18.34	\$ 62.10	\$ -	\$ -
0001731255TG0C7	1	300	1-Apr-20	\$ 11.55	\$ 38.96	\$ 0.01258	\$ 0.03792
0001731355TG9C3	1	300	1-Apr-20	\$ 9.99	\$ 38.91	\$ -	\$ -
0001760225TG74E	1	300	1-Apr-20	\$ 26.08	\$ 49.48	\$ 0.02431	\$ 0.04415
0001760343TG035	1	300	1-Apr-20	\$ 14.78	\$ 30.51	\$ 0.01808	\$ 0.03551
0001772060TG902	1	200	1-Apr-20	\$ 25.98	\$ 69.88	\$ -	\$ -
0001772165TGD49	1	200	1-Apr-20	\$ 6.92	\$ 23.79	\$ -	\$ -
0001780560TGADB	1	50	1-Apr-20	\$ 8.92	\$ 18.63	\$ -	\$ -

ICP Number	Number of Consumers	Contract Capacity kVA	Charges effective from	Pass-through portion of Fixed Price per Day	Total Fixed Price per Day	Pass-through portion of Variable Price per Day kWh	Total Variable Price per Day kWh
0001811005TG57F	1	300	1-Apr-20	\$ 3.15	\$ 13.19	\$ 0.03167	\$ 0.11589
0001820703TGB7E		200	1-Apr-20	\$ 10.84	\$ 36.80	\$ 0.01155	\$ 0.03504
0001830031TGBE0	1	150	1-Apr-20	\$ 0.42	\$ 22.32	\$ -	\$ -
0001830497TGE71	1	300	1-Apr-20	\$ 4.48	\$ 32.37	\$ 0.01089	\$ 0.06002
0001830541TGBB8	1	3500	1-Apr-20	\$ 528.03	\$ 1,167.05	\$ -	\$ -
0001830828TGF11	1	200	1-Apr-20	\$ 0.58	\$ 10.76	\$ -	\$ -
0001830903TG594	1	200	1-Apr-20	\$ 0.28	\$ 7.17	\$ -	\$ -
0001840612TG6CA	1	100	1-Apr-20	\$ 14.54	\$ 37.35	\$ 0.01173	\$ 0.02796
0001930500TG134	1	100	1-Apr-20	\$ 2.22	\$ 4.87	\$ 0.01917	\$ 0.04084
0001940050TG680	1	200	1-Apr-20	\$ 10.61	\$ 31.94	\$ 0.01482	\$ 0.04058
0001940060TG178	1	500	1-Apr-20	\$ 36.82	\$ 119.58	\$ 0.01415	\$ 0.04116
0001940090TG16F	1	200	1-Apr-20	\$ 3.70	\$ 11.75	\$ 0.02207	\$ 0.06392
0001940095TGC20	1	500	1-Apr-20	\$ 8.37	\$ 31.34	\$ 0.01778	\$ 0.05860
0001940100TG78C	1	300	1-Apr-20	\$ 25.54	\$ 71.53	\$ 0.01585	\$ 0.04064
0001940110TGD21	1	300	1-Apr-20	\$ 9.99	\$ 30.79	\$ 0.02145	\$ 0.05998
0001940350TG583	1	150	1-Apr-20	\$ 7.45	\$ 16.11	\$ 0.01606	\$ 0.03302
0001940650TG086	1	300	1-Apr-20	\$ 20.90	\$ 42.43	\$ 0.02280	\$ 0.04403
0001940905TGACE	1	150	1-Apr-20	\$ 8.57	\$ 19.40	\$ 0.01507	\$ 0.03222
0001940907TGA4B	1	500	1-Apr-20	\$ 35.21	\$ 65.53	\$ 0.02730	\$ 0.04871
0001940910TGD2C	1	500	1-Apr-20	\$ 43.54	\$ 100.58	\$ 0.01340	\$ 0.02901
0001941000TGF28	1	200	1-Apr-20	\$ 18.50	\$ 38.04	\$ 0.01743	\$ 0.03407
0001950500TG36C	1	200	1-Apr-20	\$ 16.72	\$ 23.31	\$ 0.02021	\$ 0.02772
0001950550TGB64	1	500	1-Apr-20	\$ 17.61	\$ 26.44	\$ 0.02082	\$ 0.03058
0001950800TG664	1	300	1-Apr-20	\$ 3.65	\$ 7.51	\$ 0.03158	\$ 0.06261
0001950850TGE6C	1	500	1-Apr-20	\$ 0.74	\$ 5.08	\$ 0.06443	\$ 0.36497
0001950900TGF60	1	150	1-Apr-20	\$ 15.58	\$ 23.60	\$ 0.01703	\$ 0.02523
0001951100TGEC D	1	150	1-Apr-20	\$ 11.74	\$ 27.32	\$ 0.01574	\$ 0.03443
0001951200TGDCE	1	500	1-Apr-20	\$ 9.56	\$ 24.58	\$ 0.04536	\$ 0.10848
0001951320TG99F	1	500	1-Apr-20	\$ 10.72	\$ 25.79	\$ -	\$ -
0001951350TGCC2	1	200	1-Apr-20	\$ 1.42	\$ 4.78	\$ 0.01749	\$ 0.05468
0001951500TG2CC	1	300	1-Apr-20	\$ 36.02	\$ 52.52	\$ 0.01381	\$ 0.01969
0001951600TG1CF	1	150	1-Apr-20	\$ 9.27	\$ 13.40	\$ 0.02767	\$ 0.03936
0001951750TG0C3	1	200	1-Apr-20	\$ 16.48	\$ 23.65	\$ 0.01845	\$ 0.02599
0001951790TG72C	1	500	1-Apr-20	\$ 27.49	\$ 40.12	\$ 0.02212	\$ 0.03161
0001952100TGC2D	1	750	1-Apr-20	\$ 41.18	\$ 71.22	\$ -	\$ 0.05638
0001952400TG928	1	150	1-Apr-20	\$ 8.97	\$ 15.13	\$ 0.02649	\$ 0.04346
0001952500TG02C	1	500	1-Apr-20	\$ 36.71	\$ 63.18	\$ 0.01852	\$ 0.03075
0001952510TGA81	1	200	1-Apr-20	\$ 0.74	\$ 4.95	\$ -	\$ -
0001990133TG0E5	1	7250	1-Apr-20	\$ 507.36	\$ 885.75	\$ -	\$ -
0001990220TG58B	1	7500	1-Apr-20	\$ 1,473.87	\$ 1,756.91	\$ -	\$ -
0002011523TGC1A	1	150	1-Apr-20	\$ 10.61	\$ 56.80	\$ -	\$ -
0002110863TGE7B	1	300	1-Apr-20	\$ 13.22	\$ 30.49	\$ 0.01509	\$ 0.03272
0002381026TGF20	1	200	1-Apr-20	\$ 20.76	\$ 89.47	\$ 0.01148	\$ 0.04223

LLNW - OtagoNet Joint Venture - Lakeland Region Pricing Schedule						
Prices Effective from 1 April 2020						
Standard Residential Connections				Per Day		
Fixed Charges	Capacity	Description	Code	Distribution	Pass-through	Total
	15 kVA	Single phase 63 amp	LD15	\$0.1198	\$0.0302	\$0.1500
	15 kVA	Three phase 20A MCB	LM15	\$0.1198	\$0.0302	\$0.1500
	8 kVA	Single Phase 32A MCB	LD08	\$0.0328	\$0.0083	\$0.0411
Variable Charges			Code	(cents / kWh)		
	Uncontrolled 24hr	Summer	S24S	8.24	2.08	10.32
	Uncontrolled 24hr	Winter	S24W	12.40	3.13	15.53
	Controlled 20	20 Hour Supply	S20C	5.64	1.42	7.06
	Controlled 16	16 Hour Supply	S16C	3.04	0.77	3.81
	Night Boost 5	13 Hour Supply	S13C	4.14	1.04	5.18
	Night Boost 3	11 Hour Supply	S11C	2.38	0.60	2.98
	Night Only	8 Hour Supply	S08C	1.04	0.26	1.30
	Distributed Generation	24 Hour Supply	LDDG24	0.00	0.00	0.00

General Connections						
				\$ per Day		
Capacity	Description	Code		Distribution	Pass-through	Total
1 kVA	Single Phase 5A MCB+	LS001	Fixed Charges	\$0.4893	\$0.1233	\$0.6126
2 kVA	Single Phase 63 amps++	LS002		\$0.9684	\$0.2441	\$1.2125
8 kVA	Single Phase 32A MCB	LS008		\$0.5571	\$0.1404	\$0.6975
15 kVA	Single Phase 63 amps	LS015		\$0.9618	\$0.2424	\$1.2042
23 kVA	Single Phase 100 amps	LS023		\$1.2139	\$0.3059	\$1.5198
28 kVA	Two Phase	LT028		\$1.4683	\$0.3700	\$1.8383
15 kVA	Three Phase 20A MCB	LT015		\$0.9618	\$0.2424	\$1.2042
24kVA	Three Phase 32A MCB	LT024		\$1.2648	\$0.3187	\$1.5835
41 kVA	Three Phase 63 amps	LT041		\$2.1296	\$0.5367	\$2.6663
69 kVA	Three Phase 100 amps	LT069		\$3.5541	\$0.8957	\$4.4498
103 kVA	Three Phase 150 amps	LT103		\$5.2839	\$1.3316	\$6.6155
138 kVA	Three Phase 200 amps	LT138		\$7.0646	\$1.7803	\$8.8449
172 kVA	Three Phase 250 amps	LT172		\$19.0150	\$4.7920	\$23.8070
207 kVA	Three Phase 300 amps	LT207		\$22.7127	\$5.7238	\$28.4365
276 kVA	Three Phase 400 amps	LT276		\$28.3538	\$7.1454	\$35.4992

Capacity	Description	Code		\$Per day		
				Distribution \$/kW	Pass-through \$/kW	Total \$/kW
1 kVA	Single Phase 5A MCB+	LS001	Control Period Demand	\$0.00000	\$0.00000	\$0.00000
2 kVA	Single Phase 63 amps++	LS002		\$0.00000	\$0.00000	\$0.00000
8 kVA	Single Phase 32A MCB	LS008		\$0.44342	\$0.11175	\$0.55516
15 kVA	Single Phase 63 amps	LS015		\$0.44342	\$0.11175	\$0.55516
23 kVA	Single Phase 100 amps	LS023		\$0.48334	\$0.12181	\$0.60514
28 kVA	Two Phase	LT028		\$0.48334	\$0.12181	\$0.60514
15 kVA	Three Phase 20A MCB	LT015		\$0.44342	\$0.11175	\$0.55516
24kVA	Three Phase 32A MCB	LT024		\$0.48334	\$0.12181	\$0.60514
41 kVA	Three Phase 63 amps	LT041		\$0.48334	\$0.12181	\$0.60514
69 kVA	Three Phase 100 amps	LT069		\$0.48334	\$0.12181	\$0.60514
103 kVA	Three Phase 150 amps	LT103		\$0.48334	\$0.12181	\$0.60514
138 kVA	Three Phase 200 amps	LT138		\$0.48334	\$0.12181	\$0.60514
172 kVA	Three Phase 250 amps	LT172		\$0.32798	\$0.08265	\$0.41063
207 kVA	Three Phase 300 amps	LT207		\$0.32798	\$0.08265	\$0.41063
276 kVA	Three Phase 400 amps	LT276		\$0.32798	\$0.08265	\$0.41063

Residential definition - a residential consumer is where the consumer's metered point of connection to the network is for the purposes of supplying a home (the principle place of residence of the consumer), not normally used for any business activity and not used as a holiday home.

Control Period Demand (CPD) - each general connection ICP greater than 2kVA will have an individually assessed kW demand level calculated each year. The annually assessed CPD level will be effective from 1 April each year.

Summer/Winter

Winter - 1 May to 30 September

Summer - 1 October to 30 April

Losses

400V

Loss Code	Loss Factors	Loss Code	Loss Factors
LLNW02 Winter Day	1.067	LLNWNL Winter Day	1.0000
Winter Night	1.067	Winter Night	1.0000
Summer Day	1.067	Summer Day	1.0000
Summer Night	1.067	Summer Night	1.0000

Notes

+ Unmetered connection

++ Unmetered Builders Temporary Supply must have 20A MCB fitted to switch board.

APPENDIX 2: CPD KW DISCOUNT

The table below lists the discount rate to be applied to the winter kWh for each register prior to the calculation of the assessed CPD kW for each ICP. The network tariff codes contained in the table are those to be supplied for variable consumption reporting in retailer EIEP1 files submitted to OtagoNet.

Register Contents	Network Tariff Code		CPD kW
	Standard Domestic	Non-Standard Domestic	Discount
UN24	S24S	S24SND	Nil
UN24	S24W	S24WND	Nil
CN20	S20C	S20CND	25%
CN16	S16C	S16CND	50%
CN13	S13C	S13CND	60%
CN11	S11C	S11CND	75%
CN8	S08C	S08CND	100%