

LINE PRICING METHODOLOGY

FOR THE POWER COMPANY LIMITED (TPCL) NETWORK AS AT 1 APRIL 2023

# **TABLE OF CONTENTS**

Glo	ssary	. 3
1.	Introduction	. 4
2.	Contextual information about TPCL	. 5
3.	TPCL Pricing Overview	. 8
4.	Pricing Strategy	14
5.	Pricing Principles Assessment	19
6.	Revenue Requirement	24
7.	Method for Cost Allocation	26
8.	Cost Allocation to Capacity Groups	32
9.	How fixed and variable prices are set	59
10.	Non-standard contracts	62
11.	Distributed Generation	63
App	pendix 1: Commerce Commission Information Disclosure Requirements	65
Арр	pendix 2: Line Charge Tables	66

## **GLOSSARY**

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.

**Contract Capacity** is the capacity of a customer used for billing purposes. It is formalised 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 TPCL'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.

ENA is the Electricity Networks Association

**Grid Exit Point (GXP)** means the Grid Exit Point and is the connection point between the Transpower grid and TPCL's network

Group Customers include most customers with a Contract Capacity up to 100 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 TPCL's 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 utilising 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 Night 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).

# 1. INTRODUCTION

As a consumer Trust owned company, TPCL is not subject to Commerce Commission (the Commission) revenue cap regulation. However, it does face regulatory disclosure regulations. This document discloses information required under section 2.4 of the Information Disclosure Determination relating to how TPCL determines its target revenue and sets prices. It also assesses how our pricing compares with the Electricity Authority's (the Authority) Distribution Pricing Principles.

We first provide contextual information about TPCL's network (section 2), then present an overview of our prices and how they are set (section 3). We discuss our forward pricing strategy (section 4) We then assess our pricing against the Authority's Distribution Pricing Principles (section 5). This is followed by a more detailed discussion of how overall target revenue is determined, how that revenue is allocated to customer groups, and the methodology used to convert the revenue requirement into prices (sections 6 to 10). Charges for generators connected to TPCL's network are described (section 11).

Changes made to the previous methodology include a new allocation methodology incorporating Transpower's new pricing methodology (section 8). Implementing TPCL's pricing strategy of increasing the recovery of revenue through fixed charges.

# 2. CONTEXTUAL INFORMATION ABOUT TPCL

#### 2.1 TPCL's Network

TPCL is an electricity network asset company formed in 1991. It owns the electricity network assets in the Southland area, excluding parts of Invercargill City and the Bluff township area. TPCL is owned by owned by the consumers connected to the network and the Southland Electric Power Supply Consumer Trust exercises the ownership rights on behalf of those consumers.



TPCL supplies around 37,100 residential, commercial, and industrial customer connections. Key industries within TPCL's network area include sheep, beef and dairy farming, meat processing, black and brown coal mining, forestry, timber processing, and tourism. At 4.1 ICPs per km of line, TPCL has the second lowest line density of NZ's 29 electricity distribution networks.

Energy transmitted on TPCL's network is supplied by four Transmission Grid Exit Points (GXPs) at Invercargill, North Makarewa, Gore, and Edendale. In addition, up to 72MW of generation is injected from Meridian's White Hill wind farm, Pioneer Generation's Monowai hydro station and Southern Generation Limited Partnership's Flat Hill wind farm.

From those points of supply, TPCL's subtransmission network, including 505km of 66kV lines and 400km of 33kV lines and underground cables, connects to its 37 zone substations which transform High Voltage (HV) to Medium Voltage (MV). TPCL's distribution network consists of approximately 6,714 km of 11kV lines and 153km of 11kV underground cables. Around 10,500 distribution transformers connect the Low Voltage (230V) network, which has 846 km of lines and 213km of underground cable.

#### 2.2 Upcoming investment in network capacity

As at end March 2022, the value of TPCL's network assets in its Regulatory Asset Base was \$459 million. Over the next three years TPCL intends to invest \$115.83 million in its network, including \$51.18 million in asset replacement and \$15.07 million specifically relating to addressing system growth.

Of relevance to pricing decisions is the extent of network capacity constraints, and the potential for these to be signalled to customers. As is detailed in TPCL's Asset Management Plan (AMP):

- Seven of TPCL's 37 zone substations [Glenham, Tokanui, North Gore, South Gore, Riversdale, Winton, and North Makarewa 66kV portion] are at or approaching maximum capacity. Upgrades (and in some cases load transfers) are planned for a number of these, with load being reviewed annually.
- Two GXPs, Gore and North Makarewa, are approaching capacity with load control currently in use to keep loads under capacity limits. These would need to be upsized when load control is no longer sufficient to keep demand within capacity limits.
- MV line upgrades may be required to support subdivision developments in Athol and Kingston, depending on growth in those areas.
- The extent of irrigation growth could also contribute to whether new substations and line upgrades are required in some locations.
- A number of MV transformers are near full capacity and will be monitored to determine where upgrades or relocations are needed.

#### 2.3 Uptake of evolving technologies

Several technologies have the potential to change the way electricity is used and generated. Pricing has a role to play in providing efficient signals about the economic costs of using electricity networks. In that context, we provide a brief summary of existing and expected uptake of a number of these technologies: solar, electric vehicles and battery storage.

#### Solar (Photovoltaic) connections

As at February 2023, TPCL had 512 solar connections to its network, equivalent to 1.36% of all TPCL ICPs. This rate is below the national average of 2.97%, and significantly below the rate of 7.04%, which is the average of the top ten highest uptake EDB areas. There is slight acceleration in uptake on TPCL's network: the average number of new solar connections per month over the 12 months to February 2023 was 4.2, as compared with 5.2 and 3.2 for the prior two preceding 12-month periods.

TPCL explores the potential for growth in solar uptake and impact on the network in the company's Asset Management Plan (AMP). Through our annual customer engagement survey, 38% of customers across all PowerNet managed networks were considering buying and install solar panels in 2022. This is an increase from 28% indicated in the earlier 2018 survey showing customers are increasingly perceiving solar PV as a valuable investment. The main barriers to adoption related to economic reasons where projected payback period was a large influence on the purchase intention. Other considerations that may limit solar uptake are property ownerships and energy cost reduction options such as home insulation and electric vehicles now receiving increasing attention and better returns.

Solar installations are likely to reduce total energy consumption 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

There are approximately 153 electric vehicles registered in the TPCL area. With the continuation of the Clean Car rebate where full electric cars can get up to \$8,625 rebate and with the increase in the cost of fuel, we expect electric vehicle adoption to grow year on year. As is explained in our AMP, EVs have the potential to have large impacts on network demand with sufficient adoption. Prices are an important means for signalling peak periods, and enabling customers to choose whether to charge offpeak, or pay a premium and charge during peak periods.

If customers choose not to charge off-peak in response to price signals, EV 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 EVs.

Having pricing structures in place before EV uptake reaches widespread levels will enable a degree of 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 TPCL explains in the AMP, the majority of new DG is from solar PV, while TPCL's network peak is historically on winter evenings. Coupling solar PV generation with energy storage could change this dynamic, but at present rates the storage capacity provided is immaterial. Storage gives customers some control over their demand without impacting their consumption and could make it feasible for customers to go "off-grid" with a sufficiently sized generation source. 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 future pricing structures 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. If any such developments occur in the second half of the planning period, it is expected that they will take several years to have an impact at the network level, during which time TPCL can respond in a focused manner. Any impact these devices have is likely to be beneficial in terms of network constraints, as they act to reduce rather than increase the peak demand on network assets.

#### 2.4 The Power Company Ltd and PowerNet Limited Structure

PowerNet Limited (PowerNet) is an incorporated joint venture owned by TPCL and Electricity Invercargill Limited (EIL) and is contracted to manage the network assets of TPCL in accordance with a Management Agreement (Agreement).

The Agreement includes provision for PowerNet to act as manager on behalf of TPCL to collect revenue from line and metering charges to retailers or end consumers, pay transmission costs, incur maintenance expenditure and to pass the net amount through to TPCL each month. PowerNet charges a management fee that covers its overheads for operating the line and metering businesses for TPCL.

# **3. TPCL PRICING OVERVIEW**

TPCL's prices are used to charge electricity retailers for the cost of its local electricity distribution network, pass-through costs (such as industry levies) and the costs associated with national grid transmission. As highlighted above, 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.

TPCL uses "GXP billing" for its residential and general connections. This means that variable consumption charges are based on electricity volumes injected into the network at the Transpower grid exit points, rather than based on the usage at individual customer connection 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 ultimately transferred back into the pricing.

#### 3.1 Consumer load groups used for pricing

There are two defined types of consumers: Residential and General consumers; and Individual Consumers (for which prices are connection-specific).

#### 3.1.1 Individual Consumers

There are 277 consumers for whom TPCL calculates a connection-specific lines charges. These consumers are referred to as "Individual Consumers," and are required to have half-hour or time-of-use meters, including kVA maximum demand registers.

In most cases, these installations have contract capacities in excess of 100kVA. Due to their size, these consumers have a higher impact on the network design and operation and therefore their geographic location is taken into account when calculating their individual line charges. Customers who are supplied closer to zone substations and Grid Exit Points use less of the network; individual line charges can reflect this. This also provides a signal for future investment and through the correct pricing discourages network by-pass.

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.

In the case of these consumers, there are also individually calculated or estimated loss factors.

These consumers, through the half-hour or time-of-use metering, have individual energy and demand profiles, which are used to calculate the line charges. Metering of these consumers includes kVA demand metering which provides the peak demand and also the anytime peak demand. The latter figures are used in the calculation of line charges and to determine the contract capacity. For these consumers, the contract capacity is based on the next highest standard transformer size above their anytime 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.

#### **Irrigation Installations and Embedded Networks**

Irrigation installations and embedded networks are a sub-group of individual consumers. An "Irrigation Installation" is a connected customer's installation, which is used solely for pumping water commercially for irrigating farmland. An "Embedded Network" is an electricity distribution network that is owned by someone other than TPCL and is connected to TPCL's network via a registered Network Supply Point. 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 installations and embedded networks this subgroup of installations will have, their line charges calculated in the same way as individual customers, but will have the total line charge recovered with a fully fixed line charge and must be metered with fully compliant half hour metering.

#### 3.1.2 Residential and General customers

The Residential and General category includes all residential connections and general single and 3 phase connections up to 100kVA capacity. Prices for these customers include a daily charge and a kWh price applied to energy used during the Peak period, which is defined as 7am to 11am and 5pm to 9pm, the Shoulder period, which is defined as 11am to 5pm and 9pm to 11pm and energy usage during the Night period (11pm to 7am).

Prices for Residential and General consumers vary according to:

• **Connection density (Urban or Rural):** The urban areas are defined as where the transformer capacity density of the 11kV line or cables is at least 120kVA/km and where there is a prevalence of transformers in excess of 100kVA per unit and consists of at least 50 customers within a continuous boundary and within 20 km of a zone substation.

The remaining areas are classified as rural and there is a price cap on the fixed charge component of the line charge.

- Capacity:
  - General connections are split between single and three phase categories, they are then further disaggregated into load groups based on the size of the service fuse or size of transformer supplying them. The differentials between load groups reflect the use of the network assets for each group and the diversity each group has around peak load times.

Residential connections are either 8 kVA or 15 kVA. 8kVA residential connections require a 32-amp circuit breaker to be installed on the main switchboard to control the complete installation. This capacity is only allowed for single-phase installations.

Different consumer groups are based on practical fuse sizes. For pricing purposes, all
residential consumers are classed as single-phase irrespective of whether they are
supplied two-phase or three-phase. This is due to the fact that for many of the
consumers there was no choice in their method of supply and there are many older
multi-phase residential installations. All old residential consumer installations are
classed as "historic residential".

• **Control:** Whether there is significant controllable load on the premises. If so, the connection qualifies for a "with off peak" line charge, which is lower than the "all peak" prices that apply connections without significant controllable load. The eligibility for a "with off peak" line charge is determined on the basis that at least 25% of the total annual energy consumption is separately metered on a ripple controlled tariff, such as a water heater or consumed between 23:00 and 07:00 hours.

In line with the Electricity (Low Fixed Charge Tariff Option for Domestic Consumers) Regulations 2004, residential customers consuming less than 9000 kWh per annum are able to transfer to the Residential Low User option tariffs. From 1 April 2022 the Low Fixed Charge Tariff Option commenced being phased out over a 5-year period in line with the Government phase out of this regulation. The phase out allows distributors to increase the daily fixed charge by an additional 15 cents per day for each of the 5 years, and when it reaches 90 cents per day in 5-years' time it will be removed altogether. To be eligible for the Low Fixed Charge Tariff Option the connection must meet the residential definition of "a residential consumer is where the consumer's metered point of connection to the network is for the purposes of supplying a home (the principal place of residence of the consumer), not normally used for any business activity and not used as a holiday home. The connection must meet the definition of "Domestic premises" under Section 5 of the Electricity Industry Act 2010".

These options attract a lower fixed daily charge and a higher variable consumption charge. Retailers with customers on these pricing plans must submit the monthly consumption amounts for these customers in a separate file to PowerNet.

The consumer specific pricing options available for Residential and General consumers are as follows:

	Code	2
Residential Standard	Urban	Rural
Small Residential (8kVA 1 Phase) - All Peak	UD08P	RD08P
Small Residential (8kVA 1 Phase) - With Off Peak	UD08Q	RD08Q
Residential (15kVA 1 Phase) - All Peak	UD20P	RD20P
Residential (15kVA 1 Phase) - With Off Peak	UD20Q	RD20Q
Residential Low Fixed Charge Option (8kVA 1 Phase) - All Peak	UDL08P	RDL08P
Residential Low Fixed Charge Option (8kVA 1 Phase) - With Off Peak	UDL08Q	RDL08Q
Residential Low Fixed Charge Option (15kVA 1 Phase) - All Peak	UDL20P	RDL20P
Residential Low Fixed Charge Option (15kVA 1 Phase) - With Off Peak	UDL20Q	RDL20Q
General Single Phase	Urban	Rural
Street Lights (1 Phase)	US001L	RS001L
1 kVA 1 Phase - All Peak	US001P	RS001P
8 kVA 1 Phase - All Peak	US008P	RS008P
8 kVA 1 Phase - With Off Peak	US008Q	RS008Q
15 kVA 1 Phase - All Peak	US020P	RS020P
15 kVA 1 Phase - With Off Peak	US020Q	RS020Q
General Three Phase		
15 kVA 3 Phase - All Peak	UT015P	RT015P
15 kVA 3 Phase - With Off Peak	UT015Q	RT015Q
30 kVA 3 Phase - All Peak	UT030P	RT030P

30 kVA 3 Phase - With Off Peak	UT030Q	RT030Q
50 kVA 3 Phase - All Peak	UT050P	RT050P
50 kVA 3 Phase - With Off Peak	UT050Q	RT050Q
75 kVA 3 Phase - All Peak	UT075P	RT075P
75 kVA 3 Phase - With Off Peak	UT075Q	RT075Q
100 kVA 3 Phase - All Peak	UT100P	RT100P
100 kVA 3 Phase - With Off Peak	UT100Q	RT100Q

#### 3.2 Summary of target revenue and pricing changes

TPCL made a significant change to its pricing structure from 1 April 2022 as we move to more cost-reflective pricing. Changes made to TPCL's pricing are:

• Time of Use (TOU) pricing for Residential and General Customers' is replacing the existing Day/Night variable (kWh) line charge price structure. TOU now consists of three time periods for variable line charge prices these being:

Peak period, which is defined as 7am to 11am and 5pm to 9pm; and

Shoulder period, which is defined as 11am to 5pm and 9pm to 11pm; and

Night period 11pm to 7am.

- In line with the Government announced phase out of the Electricity (Low Fixed Charge Tariff Option for Domestic Consumers) Regulations 2004 TPCL has increased the daily fixed charge to the Residential Low Fixed Charge Option customers.
- Transpowers new line pricing methodology which takes effect from 1 April 2023 has resulted in a change to the allocation methodology (section 8)

Target revenue for 2023/24 is calculated at \$72.78 million, increasing from \$69.3 million the previous year. Below is a summary revenue for both transmission costs and distribution price components broken down by the two customer group categories for the 2023-24 year. We also outline the change in revenue compared with the previous year:

	Group customers	Individual customers	Total
2023-24 Revenue			
Distribution	\$52,966,773	\$8,723,748	\$61,690,521
Transmission	\$5,780,924	\$5,310,284	\$11,091,208
Total	\$58,747,697	\$14,034,032	\$72,781,729
Previous year			
Distribution	\$48,684,251	\$7,819,915	\$56,504,166
Transmission	\$7,247,209	\$5,540,211	\$12,787,420
Total	\$55,931,460	\$13,360,126	\$69,291,586

The changes in revenues are based on changes to our costs and our allocation of these costs to the customer groups. Other factors that impact on the allocation of costs relate to changes in quantities and individual customers profile changes as well as contractual changes.

Transmission changes relate to a change in Transpower's line pricing methodology which has resulted in a decrease in charges (outlined in section8.1)..

Distribution revenue changes reflect changes in operation and maintenance costs and capital investment requirements.

For the average residential consumer, the total TPCL price (including distribution and transmission) will increase by approximately \$2.98 (excluding GST) per month. Residential customer pricing is as follows:

Daily prices		2022/23	2022/23	2022/23	2023/24	2023/24	2023/24
Residential – urban	\$/day	1.2800			1.3151		
Residential – rural	\$/day	1.4492			1.4855		
Residential – Low Fixed Charge	\$/day	0.2000			0.300		
Variable Charges		Peak	Shoulder	Night	Peak	Shoulder	Night
All except low user	c/kWh	9.347	8.345	1.00	9.347	8.345	2.00
Low User	c/kWh	14.977	12.975	1.00	14.247	12.63 3	2.00

We note that discounts are now included in our pricing schedule. The methodology on how these discounts are determined is available on our website. These discounts are provided to consumers as an annual rebate on their bill via their electricity retailer.

#### 3.3 Customer Consultation

Where significant changes in pricing structure are considered, TPCL consults with retailers and customer groups. The pricing to changes that took effect on 1 April 2022 involved significant changes, TPCL consulted with retailers and the Southland Electric Power Supply Consumer Trust on the change to Time-of-Use pricing and the likely impact to customers.

Even in the absence of significant pricing change, TPCL seeks the views of consumers as part of the asset management process and has reflected these views in the published AMP. This included a face to face survey with key clients including expectations on price and current service

- 1. A bulk phone survey of current customers including expectations on price and quality
- 2. Consultation meetings at various locations throughout the network
- 3. 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.

## 4. PRICING STRATEGY

Given that TPCL's pricing to Individual Customers is highly cost reflective and service based, the focus of the pricing strategy has primarily been on the structure of pricing for residential and general customers.

On 1 April 2022 TPCL introduced mandatory Time of Use (TOU) pricing for all residential and general customers as the first stage to more cost reflective pricing.

TPCL's costs including Transpower charges are increasingly being fixed, TPCL's strategy is to ensure that these fixed costs are passed onto customers and that a larger proportion of TPCL's overall revenue is recovered through the fixed daily charges. From 1 April 2023 the revenue increase will be recovered by increasing the level of fixed charges and increasing the night variable price to 2 cents per kWh (except for the low user variable charges due to phase out) and holding the variable line charge prices for the residential and general customers.

### 4.1 Time of Use (TOU) Pricing

TPCL's variable pricing previously consisted of a variable price for Day (7am to 11pm) energy and zero for Night (11pm to 7am) energy. This pricing sent a strong signal for customers to shift consumption into the night period, it did not however signal times during the day when the network is at peak loading or times when there is there is spare capacity in the network. It made no difference, if for example people with EV's charged their cars at 5pm, network peak time or at 2pm, network off-peak time. This lack of signal could force the network to invest in expensive upgrades and pushing the price of line charges higher for everyone.

TPCL has completed significant work on examining alternative cost reflective pricing options.

We evaluated five different cost reflective pricing options on the following criteria:

- 1. Economic Efficiency
- 2. Actionable and Simple
- 3. Supports retail Competition
- 4. Durable and Flexibility
- 5. Stable/Predictable

The combination of installed capacity and TOU was superior to all other options under the evaluation process. From 1 April 2022 this combination was the start of our cost reflective pricing journey as we look to provide customers with better pricing signals and a choice of when and how much they pay for their line charges, which is efficient and fair for the long term benefit to all our customers.

#### 4.2 TOU price implementation.

PowerNet has engaged in work streams 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

along with comprehensive customer impact analysis. We have introduced new loss codes to identify low user energy at a GXP level to aid the analysis.

As a result of all the previous work a combination of installed capacity and TOU pricing for residential and general consumers was implemented from 1 April 2022.

TOU pricing provides an incentive for consumers to shift energy usage out of peak periods, which can avoid or defer costly network upgrades. New uses of electricity such as solar generation, batteries, electrification and charging EVs are increasing the scope for network pricing to influence investment and cost-shifting outcomes mean that it will be even more important to have meaningful peak pricing signals. Ensuring that the supporting price structures, such as TOU, are in place before EV uptake is widespread will mean that pricing will be up and running and effective when it is needed, allowing time for consumer education and for networks to understand consumer preferences and price responsiveness.

The time-bands shown in the graph below for peak, shoulder, and night were selected based upon the times that peaks occur on our network. We will continually review peak times at our individual GXP's and zone substations to ensure the time bands are appropriate and will make changes if required.



Graph: TPCL TOU time periods

The price differential between the peak and shoulder price will initially be marginal but as network constraints become greater or we have EV clustering on the network, we will use the price differential as a tool to send stronger signals to customers to shift load out of the peak periods and therefore avoiding or deferring expensive network upgrades.

#### 4.3 Installed Capacity (Charges)

As a significant proportion of TPCL's costs are essentially fixed, it would not be efficient for all costs to be recovered through charges that relate to energy usage. As a result, a portion of our costs are recovered from daily fixed charges. TPCL's daily charges vary according to a connection's capacity (installed capacity) and availability of controlled load.

Customers with at least 25% of their total energy consumption on a controlled load or energy used during the night period qualify for the "off-peak" fixed charge price, which is up to 35% reduction on the "peak" price. This price incentive is fixed for customers and does not vary according to monthly consumption, it provides a strong signal and a tool for TPCL to control the load on the network during congestion periods therefore helping to avoid network upgrades and price increases.

This year 47% of TPCL's total line charge revenue is from fixed charges, with the 5-year phase out of the Low Fixed Charges and the fact that the majority of costs are fixed, TPCL will look to increase the share of total revenue from fixed charges over time.

#### 4.4 Customer Impact analysis

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.

TPCL has completed extensive impact analysis of a shift to installed capacity and TOU pricing. The analysis involved modelling over 52% of the residential and general customers who had more than 12 months' worth of half hourly smart meter data. Each ICP was overlaid with a NZ deprivation level index rating which was derived by the University of Otago using NZ census data to enable us to evaluate the impact at a socioeconomic level.

The analysis shows that the change to TOU pricing has very little impact on total charges for residential consumers, regardless of whether the consumer is a standard or low user. The analysis also shows that consumers in the most deprived deciles face less impact on their charges than customers in the least deprived deciles.

Summarized in the below table we examine the break-down of energy usage by customer category by decile level:

# **TPC:** General Descriptive Statistics :Consumption

TPC ICD Shilt	Total				Depreviation Decile							
TPC ICP Split	TULAI	A	dvantage	d		Midd	le NZ		Most Deprived			
			1	2	3	4	5	6	7	8	9	10
Network ICP Cou	int											
Residential		26,948	2,445	2,603	3,209	3,151	3,260	3,792	2,862	2,890	2,307	429
	% of Total Network 36,459 ICPs	74%	7%	7%	9%	9%	9%	10%	8%	8%	6%	1%
	% of Residential 26,948 ICPs	100%	9%	10%	12%	12%	12%	14%	11%	11%	9%	2%
<b>Residential Standar</b>	d	16,614	1,750	1,784	2,192	2,108	2,101	2,348	1,533	1,488	1,115	195
	% of Total Network 36,459 ICPs	46%	5%	5%	6%	6%	6%	6%	4%	4%	3%	1%
	% of Residential 26,948 ICPs	62%	6%	7%	8%	8%	8%	9%	6%	6%	4%	1%
	% of Standard 8,781 ICPs	100%	11%	11%	13%	13%	13%	14%	9%	9%	7%	1%
Residential Low Use	r	10,334	695	819	1,017	1,043	1,159	1,444	1,329	1,402	1,192	234
	% of Total Network 36,459 ICPs	28%	2%	2%	3%	3%	3%	4%	4%	4%	3%	1%
	% of Residential 26,948 ICPs	38%	3%	3%	4%	4%	4%	5%	5%	5%	4%	1%
	% of Low User 6.547 ICPs	100%	7%	8%	10%	10%	11%	14%	13%	14%	12%	2%
Sample Average	Annual Consumption kWh											
Sumple Average	Annuar consumption kinn		10,281	kWh, 21% o	of Residential	9	121kWh,	90% of Reside	ntial	8,806kWh, 10% of Residential		
Residential Standar	d kWh	9,490	11,265	10,192	9,431	10,435	8,715	8,689	8,636	8,328	9,517	8,446
Residential Low Use	er kWh	6,021	6,538	6,359	6,245	6,163	6,114	5,887	6,053	5,768	5,575	5,672
				CLARK MY						5 6794	Wb 10% of	Desidential
			0,30	юкvv п, 9% с	of Kesi dential		6,038kV	V h, 18% of R	esidential	3,0736		NES INCIDENT
SAMPLE ICP COU	NT 52% of In Scope ICPs											
Residential Standard	53% of Group	8,793	1,062	1,022	1,123	1,013	1,045	1,262	743	821	602	100
Residential Low	57% of Group	5,868	440	476	597	545	620	830	703	829	693	135
Commercial ICP												
TPC 8kVA	44% of Group	594	52	69	111	112	90	80	32	21	22	5
TPC 15kVA	45% of Group	214	14	21	37	44	31	29	16	18	4	0
TPC 20kVA	42% of Group	1,034	73	102	161	177	171	130	69	78	64	9
TPC 30kVA	41% of Group	1,195	44	105	187	251	144	206	104	95	52	7
TPC 50kVA	50% of Group	779	23	49	117	182	90	154	61	53	43	7
TPC 75kVA	44% of Group	110	5	3	17	19	18	20	7	12	8	1
TPC 100kVA	11% of Group	6	0	1	0	1	z	1	0	1	0	0
* In Scope ICPs - All ICPS	that do not have an individual price calculated	1										

# TPC 74% Residential with 15% of total ICPs, 5,626 ICPs in the Most Deprived Band

٠

•

•

٠

Sample Consumption indicates the Annual kWh for both Standard & Low User mainly decreases as the decile becomes more deprived

16%, 4,331 Residential ICPs who are the most deprived plus Decile7, either cannot take advantage of the Low User, or it will not make a substantial difference – as they are over or close to the breakeven 9,000kWh.

13%, 3,574 Residential ICPs who are the Most Advantaged plus Decile4 have benefited from the Low User regulations

In the table below we analyze the impact by customer group and decile level of the move to MOU variable pricing:

TPCL Average Annual Bill Impact by Installed Capacity & TOU Pricing Option with Deprivation Level & Customer Group									
TPC: Fixed + TOU: YEAR ONE Avg Annual Bill Impact by Price Category and Depreviation Band	ICP Sample No.	Avg Annual Energy Useage kWh	Avg Annual Line Charge	Avg Chang Line (	e <b>to Annual</b> Charge				
Residential 74%				%	\$				
Standard Residential 62%	8,793	9,490	\$1,154	0.42%	\$4.81				
Standard Residential decile 10 - 8 (Most Deprived)	1,523	8,806	\$1,076	0.32%	\$3.43				
Standard Residential decile 7- 4 (Middle NZ)	4,063	9,121	\$1,129	0.44%	\$4.93				
Standard Residential decile 3-1 (Advantaged)	3,207	10,281	\$1,223	0.44%	\$5.32				
Standard Domestic Decile 10	100	8,446	\$1,058	0.37%	\$3.85				
Standard Domestic Decile 1	1,062	11,265	\$1,284	0.42%	\$5.40				
Low User 38%	5,868	6,021	\$698	-0.28%	-\$1.99				
Low User decile 10 - 8 (Most Deprived)	1,657	5,679	\$656	-0.27%	-\$1.80				
Low User decile 7- 4 (Middle NZ)	2,698	6,038	\$698	-0.27%	-\$1.90				
Low User decile 3-1 (Advantaged)	1,513	6,366	\$743	-0.32%	-\$2.36				
Low User Decile 10	135	5,672	\$662	-0.38%	-\$2.52				
Low User Decile 1	440	6,538	\$770	-0.39%	-\$2.99				
Commercial 25%									
General 8kVA	594	4,373	\$683	0.24%	\$1.62				
General 15kVA	214	7,273	\$1,163	0.07%	\$0.78				
General 20kVA	1,034	7,324	\$1,175	0.19%	\$2.24				
General 30kVA	1,195	13,533	\$1,950	0.12%	\$2.32				
General 50kVA	779	76,063	\$7,127	0.24%	\$17.09				
General 75kVA	110	86,297	\$9,448	-0.05%	-\$4.43				
General 100kVA	6	181,459	\$16,817	0.43%	\$72.79				
Dairy Byre	624	92,565	\$8,161	0.37%	\$30.07				
Woolsheds	304	3,139	\$987	0.09%	\$0.88				
Farm pumps	362	7,596	\$1,178	0.30%	\$3.58				

## 5. PRICING PRINCIPLES ASSESSMENT

The Authority revised its distribution pricing principles in 2019 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.

#### 5.1 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)

TPCL's cost of supply model allocates costs to individual customers based on their geographical location and taking into account their share of the actual assets employed to supply them. 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. 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. TPCL 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.

Although the methodology attempts to minimise cross subsidisation between the larger individual consumers and between consumer load groups, there may be some degree of cross subsidisation between, for instance, urban and rural consumers within the same consumer group. This was

recognised 16 years ago when a capped differential of 15% was introduced between rural and urban consumers in the same consumer group.

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

TPCL's pricing structure uses capacity-based load groups to ensure prices have regard to the level of service capacity and encourages the use of controlled energy consumption by having a price differential in the fixed charge for group customers. Load control is utilised to keep charges down by: (1) minimising Transpower charges by controlling the network load during the LSI peaks; (2) managing GXP load when maximum demand reaches the capacity of that GXP; and (3) managing load on feeders during temporary arrangements to manage constraints.

The introduction of Peak, shoulder and Night energy component of line charges to residential and general customers also provides a strong signal to consumers to utilise spare network capacity at Shoulder or Night time's thus reducing capital investment in the network. As discussed above in section 2.2, there are some assets in TPCL's network that are at or approaching capacity limits (eg, a number of zone substations), as well as two GXPs. A time-of-use pricing structure assists in deferring network upgrades. The move to TOU pricing will serve to refine and improve the signals of the previous day/night structure. Looking to the future, and the potential for developments such as EV's, to bring network assets closer to capacity limits, 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 been implemented.

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. TPCL 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.

TPCL's peak times are outlined in the methodology and have encouraged individual customers to employ demand response actions such as turning on alternative generation or load shifting during these times to reduce their peak demands. Residential customers have the option to put some of their appliances on controlled tariffs to qualify for the off-peak fixed charge.

Customers are encouraged to use energy at shoulder or night times through the use of night store heaters, heating the hot water or using their appliances such as clothes driers, washing machines etc. during these periods. The customer is then financially rewarded, as the consumption attracts lower variable line charge prices. The "whole house TOU tariff" can reward consumers financially through prudent management of their power requirements.

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

Different levels of daily charges for residential and general consumers with controlled as compared with uncontrolled connections reflect that controlled load has different service availability than uncontrolled load.

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. The use of at least some geographic pricing for residential and general customers, through the distinction between rural and urban connections, also assists in this regard.

Signalling when the network is likely to be at its busiest or when capacity is available also provides signals on when network alternatives can aid in meeting peak loads or in smoothing peaks through load shifting. TOU pricing assists with this – for example, by encouraging EV charging overnight. However it is envisaged that TOU pricing will allow more accurate signalling of network busy times than the broad day/night periods that were previously 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.

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

TPCL uses capacity charges to recover costs that are not recovered through peak demand charges (Individual Customer) or TOU kWh charges (Residential and General) charges. These types of charges would have less distortionary impacts in recovering sunk costs than kWh or demand charges would, but arguably fairer than a single fixed charge for each and every ICPs. 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. TPC is continuing to follow the transition path in the LFC Regulations for increasing fixed charges to low users.

TPCL 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) on TPCL's network area for the foreseeable future (as discussed in section 2.3) 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.

# 5.3 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 10, 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. TPCL'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.

TPCL'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 subtransmission 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, TPCL 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 TPCL 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.

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

Through the disclosure of the pricing methodology, the costs allocated to each consumer group are transparent. This allows stakeholders to make informed decisions between capacity based price categories.

TPCL has maintained its fixed pricing structure and differentials between peak and off-peak fixed charges and has introduced Peak, Shoulder and Night consumption periods for variable charges to give stability and certainty to customers who have invested in controllable load due to the price differential and potential savings when the investment is made.

Price levels for individual consumers each year are based on the previous year's performance and projections for the current year following discussions with the consumer when required.

More efficient use of electricity by these consumers 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.

All retailers who use the network are subject to the same tariff schedules from TPCL therefore, TPCL considers that its prices are economically equivalent across all retailers.

Once the line charges have been established by the methodology, the pricing structure is straight forward, limited to a fixed daily charge and variable consumption period tariff for the majority of customers. TPCL recognises that whilst the pricing structure is simple, there are a large number of options due to the urban/rural and peak/off-peak options available within each capacity group. The Electricity (Low Fixed Charge Tariff Option for Domestic Consumers) Regulations 2004 requiring a low fixed charge option for each residential tariff has also greatly 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).

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

TPCL uses "GXP billing" for its residential and general connections, which saves on administration costs, and ultimately should result in lower costs and prices.

With regard to uptake incentives, because pricing is at a GXP level for residential and general customers, TPCL's pricing structure (eg, TOU) is necessarily applied for all customers at a wholesale level. Whether TPCL's pricing structure is passed on to end consumers or repackaged is a decision made by retailers.

TPCL's pricing from 1 April 2022 did incorporate structural changes and as a result, consumer impacts of the change in price levels were predicted with through analysis.

## 6. **REVENUE REQUIREMENT**

TPCL is an electricity distribution business (EDB) that is exempt from the price quality provisions of the Commerce Act due to its trust ownership structure. As a result, TPCL's revenue is not reset by the Commission from 1 April 2023 under the Commission's Electricity Distribution Services Default Price-Quality Path Determination 2020 (the Determination).

The Commission's 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 Commission's price reset calculations.

TPCL's view is the inputs into the Commission's WACC calculation include out-of-date tax-adjusted market risk premium and narrow time bands for calculations of interest costs used in the WACC calculation.

The inputs have resulted in lower price reset outcomes, which cause concern for non-exempt EDBs. TPCL as an exempt EDB has engaged an independent expert to calculate its WACC based on its actual cost of debt and a more current tax adjusted market risk premium as proposed by the Commissions consultants for the fibre input methodologies.

TPCL's WACC is materially above the Commission's WACC used in the reset. It has been applied to the Return of Capital calculation.

#### Posted Discount

TPCL has for a number of years credited a discount to its consumers on the qualifying date of 31 August each year.

From 2019 onwards TPCL has made a further commitment by posting the discount alongside its prices schedules effective from 1 April each year.

The discount is a credit for a portion of the lines charges paid for electricity distribution services in the preceding 12 months period from 1 August to 31 July. Discounts are credited to each consumers' electricity retailer in September and the amount is then credited to their account.

#### Determining Each Component of the Revenue Requirement

This Disclosure is required to outline the costs of the EDB that are targeted to be recovered through charges for electricity distribution services.

- The estimated costs of operating TPCL's EDB for the year from 1 April 2023 to 31 March 2024 are grouped into the categories of:
- Direct network costs, including operational and maintenance cost and direct overheads.
- Indirect network costs which includes indirect overheads and administration costs
- Transmission costs, including Transpower, other distributors and distributed generators
- Regulatory depreciation (return of capital)
- Return on capital made up of TPCL's WACC return on the regulated asset base
- Regulatory taxation



Revenue Requirement for the year ended 31 March 2024	\$000
Direct network costs	12,562
Indirect network costs	7,672
Transmission costs	11,091
Depreciation (RAB)	16,737
Return of capital (WACC x RIV)	33,325
Regulatory Taxation	4,476
Total Revenue Requirement Before Discount	85,863
Posted Discount	8,500
Total Revenue Requirement	77,363

Capital contribution revenue is excluded from the revenue requirement as the revenue is netted off against the cost of the regulatory assets the contribution relates to.

Total budgeted line charge revenue before the posted discount is \$72,782,000. This results in an implicit discount of \$13,081,000 below the total revenue requirement (before the posted discount) of \$85,863,000.

# 7. METHOD FOR COST ALLOCATION

The costs from each of the categories used to calculate the Revenue Requirement are allocated between the relevant consumers and consumer groups. Each consumer or consumer groups' share of the use of the assets and costs are calculated to reflect their respective use. The objective is to reflect the share of the costs in a robust and equitable manner and the line charges be structured so that the network investment and line charges are responsive to the consumer and consumer groups' behaviour or pattern of usage.

#### 7.1 Customer Profiles

The derivation of the line charges is based on seven profile parameters relating to the customer group, or individual customer. They are:

(a) The Contract Capacity kVA (kW) of the installation

(b) The Peak demand kVA. (kW) (0700-1100 hours and 1700-2200 hours, each week day during subtransmission peak months of individual grid exit points)

(c) The Peak energy MWh. (0700-1100 hours and 1700-2200 hours, each week day during subtransmission peak months)

- (d) The Winter Day energy MWh. (0700-2300 hours, May to September inclusive)
- (e) The Summer Day energy MWh. (0700-2300 hours, October to April inclusive)
- (f) The Total energy for the 12 month period MWh.

(g) Coincident Peak demand with Transpower's individual GXP residual charge peak times, individual customers only.

#### 7.2 Transpower and Subtransmission Costs

The basis of allocation of Transpower connection charges and subtransmission costs is on the after diversity maximum demand for each customer during the periods of network maximum demand. Similarly, the allocation of the distribution costs is on an after diversity distribution capacity of the customer's installation.

TPCL's methodology takes into account the duration that the customer impacts on the peak loading hours of the network. This is achieved by allocating some of the Transmission, subtransmission and distribution costs based on the Peak energy and the Winter Day energy.

This in effect reduces the charges for a customer who 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 who are impacting regularly on the peak periods.

It has the effect of integrating the peak demand over a longer period.

#### 7.3 Peak Demand

The Peak demands for the various customers and customer groups have a diversity factor applied to them, which reflects to some extent their impact on the total after diversity maximum demand on the network. These diversity factors, based on their peak demands, are as follows:

1kVA = 100%

2kVA to 110kVA = ramp function from 13.75% to 39%

Between 110kVA and 3,000kVA = ramp function from 40% - 95%

Above 3,000kVA = 95%.

These diversity factors reflect the increased diversity of a large number of smaller customers compared to less diversity for the larger customers.

#### 7.4 Contract Capacities

Similarly, diversity factors are applied to the contract capacities of the various customers. These diversity factors are as follows:

For connections up to 50kVA = 30%

For connections between 51kVA and 100kVA = 30% - 75%

For connections between 101kVA and 2,500kVA = ramp function from 75% - 95%

For connections above 2,500kVA = 95%.

These diversities reflect the differing impacts of the different sized customers on the local capacity of the reticulation system. There is an increased diversity between the smaller customers than with the large customers with respect to the capital investment in the local distribution network.

#### 7.5 Subtransmission and Distribution Split

The costs of the subtransmission and distribution components of the line charges are split into two categories:

#### a. Supply

The "supply" part is based on the depreciation of the network assets, other ownership costs and the cost of capital required to fund the assets. As the company is owned by a consumer trust, the required gross return is presently comparatively low as most of the consumer shareholders receive an implicit benefit in the way of reduced line charges.

#### b. Maintenance

The "maintenance" part is based on the Maintenance Works Program for the current year.

Management costs for capital and maintenance work are allocated to Supply and Maintenance respectively.

The profile parameters for determining the line charges for the individual customers, grouped by capacity are:

Contract	Number	Coincident	Peak	Total Energy	Peak	Winter Day	Summer Day
Capacity		GXP Peak Demand	Demand	Reading	Reading	Reading	Reading
kVA	Connections	Reading kVA	Reading kVA	MWh	MWh	MWh	MWh
30							
50	1	9	11	59	7	13	27
	19	453	833	2,867	331	849	1,170
75	q	161	348	845	85	235	374
100	0		040	0+0	00	200	014
150	30	405	1,480	3,684	451	1,068	1,634
	61	1,134	4,886	9,264	1,279	2,956	3,961
200	57	2,098	6,026	11,862	1,464	3,138	5,715
300	40	2 595	6 75 9	10.048	2 501	6 407	8.045
500	40	3,300	0,700	19,940	2,501	0,407	0,040
750	23	2,476	5,532	14,465	1,558	4,260	6,328
	13	3,281	4,886	17,861	2,050	5,147	7,203
1000	6	3.110	3.971	13.001	1,767	4,191	5.178
1250							
1500	2	1,298	1,769	6,203	807	1,714	2,857
4900	5	1,546	2,362	7,977	679	1,460	2,178
1000	1	775	1,284	5,325	685	1,260	2,410
2000	2	1 0 28	2 760	10 808	1 100	2 0 2 3	4 868
3000	2	1,920	2,700	10,090	1,190	2,323	4,000
3500	1	136	212	1,156	86	317	463
	1	807	2,056	11,022	991	2,612	4,943
4000	1	2.299	3.728	15.282	1.109	3.144	7.152
4500			440	500			101
5000	1	34	110	503	63	175	184
9000	1	1,766	2,547	11,351	1,361	3,284	4,531
3000	1	985	5,720	25,779	1,517	4,185	12,984
10000	1	8,305	8.713	41,235	5.794	10.248	18,109
13000		5,000	0,110				
30200	1	5,254	11,641	33,547	1,964	5,559	15,997
	1	24,482	25,671	121,478	17,521	19,611	61,031

The profile parameters for determining the line charges for the Residential and General customers are:

Consumer	Code	Number of	After Diversity	Total Energy	Winter Peak	Winter Day	Summer Day
Capacity		Connections	Peak Demand	Group	Group	Group	Group
			kW	MWh	MWh	MWh	MWh
TPCL Urban							
Residential Standard							
Small Residential (8kVA 1 Phase) - All Peak	UD08P	104	95	414	47	142	179
Small Residential (8kVA 1 Phase) - With Off Peak	UD08Q	203	156	805	68	249	340
Residential (15kVA 1 Phase) - All Peak	UD20P	2,182	4,944	21,649	2,452	7,438	9,340
Residential (15kVA 1 Phase) - With Off Peak	UD20Q	7,407	14,263	73,472	6,241	22,718	31,066
Residential Low Fixed Charge Option (15kVA 1 Phase) - All Peak	UDL20P	1,639	3,712	9,391	1,064	3,226	4,052
Residential Low Fixed Charge Option (15kVA 1 Phase) - With Off Peak	UDL20Q	5,259	10,127	30,142	2,560	9,320	12,745
Residential Low Fixed Charge Option (8kVA 1 Phase) - All Peak	UDL08P	68	62	240	20	83	104
Residential Low Fixed Charge Option (8kVA 1 Phase) - With Off Peak	UDL08Q	138	107	488	41	151	206
General Single Phase							
Street Lights (1 Phase)	US001L	5,381	1,372	3,141	356	1,079	1,355
1 kVA 1 Phase - All Peak	US001P	30	30	258	29	88	111
8 kVA 1 Phase - All Peak	US008P	244	221	968	110	332	417
8 kVA 1 Phase - With Off Peak	US008Q	14	11	56	5	17	23
15 kVA 1 Phase - All Peak	US020P	377	853	3,735	423	1,283	1,611
15 kVA 1 Phase - With Off Peak	US020Q	95	183	942	80	291	398

General Three Phase							
15 kVA 3 Phase - All Peak	UT015P	108	183	730	83	251	315
15 kVA 3 Phase - With Off Peak	UT015Q	12	18	82	7	26	35
30 kVA 3 Phase - All Peak	UT030P	548	2.242	6.980	791	2.398	3.012
30 kVA 3 Phase - With Off Peak	UT030Q	92	319	1.169	99	361	494
50 kVA 3 Phase - All Peak	UT050P	324	2.956	20.135	2.281	6.918	8.688
50 kVA 3 Phase - With Off Peak	UT050Q	79	611	4.894	416	1.513	2.069
75 kVA 3 Phase - All Peak	UT075P	99	1,772	7,757	879	2,665	3,347
75 kVA 3 Phase - With Off Peak	UT075Q	17	255	1,313	111	406	555
100 kVA 3 Phase - All Peak	UT100P	26	773	4,664	528	1,602	2,012
100 kVA 3 Phase - With Off Peak	UT100Q	3	76	538	46	166	228
TPCL Rural							
Residential							
Small Residential (8kVA 1 Phase) - All Peak	RD08P	121	109	478	54	164	206
Small Residential (8kVA 1 Phase) - With Off Peak	RD08Q	96	74	380	32	117	161
Residential (15kVA 1 Phase) - All Peak	RD20P	2,386	5,405	23,666	2,680	8,131	10,211
Residential (15kVA 1 Phase) - With Off Peak	RD20Q	5,469	10,531	54,247	4,608	16,774	22,937
Residential Low Fixed Charge Option (15kVA 1 Phase) - All Peak	RDL20P	846	1,916	4,847	549	1,665	2,091
Residential Low Fixed Charge Option (15kVA 1 Phase) - With Off Peak	RDL20Q	1 969	3 791	11 283	958	3 489	4 771
Residential Low Fixed Charge Option (8kVA 1 Phase) - All Peak	RDL08P	39	35	138	12	47	60
Residential Low Fixed Charge Option (8kVA 1 Phase) - With Off	RDL08Q	25	10	80	0	07	20
r can		20	19	09	0	21	30
General Single Phase							
Street Lights (1 Phase)	RS001L	1,161	296	678	77	233	292
1 kVA 1 Phase - All Peak	RS001P	139	139	1,192	135	410	514

8 kVA 1 Phase - All Peak	RS008P	1,132	1,026	4,492	509	1,543	1,938
8 kVA 1 Phase - With Off Peak	RS008Q	26	20	103	9	32	44
15 kVA 1 Phase - All Peak	RS020P	1,649	3,735	16,353	1,852	5,618	7,056
15 kVA 1 Phase - With Off Peak	RS020Q	348	669	3,447	293	1,066	1,458
General Three Phase							
15 kVA 3 Phase - All Peak	RT015P	351	596	2,379	269	817	1,027
15 kVA 3 Phase - With Off Peak	RT015Q	19	27	129	11	40	54
30 kVA 3 Phase - All Peak	RT030P	1,823	7,453	23,207	2,629	7,973	10,013
30 kVA 3 Phase - With Off Peak	RT030Q	411	1,427	5,228	444	1,617	2,211
50 kVA 3 Phase - All Peak	RT050P	658	5,998	40,850	4,627	14,035	17,625
50 kVA 3 Phase - With Off Peak	RT050Q	510	3,949	31,641	2,688	9,784	13,379
75 kVA 3 Phase - All Peak	RT075P	100	1,796	7,862	890	2,701	3,392
75 kVA 3 Phase - With Off Peak	RT075Q	39	594	3,058	260	946	1,293
100 kVA 3 Phase - All Peak	RT100P	30	897	5,411	613	1,859	2,335
100 kVA 3 Phase - With Off Peak	RT100Q	9	227	1,614	137	499	683

# 8. COST ALLOCATION TO CAPACITY GROUPS

This section describes the cost allocations to each capacity group and individual customers using the methodology described above.

## 8.1 Transmission Charges

Transmission charges reflect the Transpower grid asset management costs incurred by TPCL based on the four grid exit points of supply.

1 April 2023 is year one of Transpower's new pricing methodology. The new methodology replaces the old interconnection charges with three new charges, a Benefit Based Charge, Residual Charge and a Transitional Cap, the pass through of these charges and the connection charge is outlined below.

With the introduction of the new Transpower pricing methodology, there is no longer any Transpower charges that can be avoided through the connection or running of distributed generation embedded in the network, the Electricity Authority has removed the requirement on distributors to make these payments to generators from the regulations. Therefore the transmission charges no longer include the equivalent costs of the embedded generation supplied by the Southern Generation point of supply at Flatt Hill wind generation at Bluff, and the Mataura Industrial Park Hydro generation at Mataura.

The four points of supply are:

- (a) Gore
- (b) Edendale
- (c) Invercargill
- (d) North Makarewa

Transpower transmission charges have four components:

- (a) Connection charge
- (b) Benefit based charge
- (c) Residual charge
- (d) Transitional cap

#### 8.1.1 Connection Charge

The Transpower connection charge is based on the Transpower local assets utilised to provide the supply and includes Transpower new investment charges.

In the case of the Invercargill point of supply the connection charge is incurred and allocated by PowerNet between TPCL and EIL, each network is connected to the transmission grid there.



The total connection charges for each point of supply are:

(a)	Gore	\$409,579
(b)	Edendale	\$205,612
(c)	Invercargill	\$460,738
(d)	North Makarewa	\$582,779

The connection charges are applied to customers on the basis of the following allocation:

Peak Demand	70%
Peak Energy	20%
Winter Day Energy	10%

For individual customers this equates to:

Point of Supply	Per kVA Peak Demand	Per Winter Peak MWh	Per Winter Day MWh
Gore	\$7.49	\$3.86	\$1.25
Edendale	\$3.75	\$3.29	\$0.97
Invercargill	\$7.18	\$3.45	\$1.14
North Makarewa	\$6.85	\$3.60	\$1.16

After the revenue from the individual customers has been subtracted from the total the remaining group customer charges are as follows:

	Per kVA Peak	Per Peak	Per Winter Day
	Demand	MWh	MWh
All Points of Supply	\$6.70	\$4.28	\$0.93

The difference in the two sets of rates above reflects the difference in losses and diversity factors between the large individual customers and the smaller customer groups.

#### 8.1.2 Benefit Based Charge (BBC)

The costs of new and some historic interconnection investments (the BBIs) will be allocated to the beneficiaries of those investments through the BBC.

BBIs include investments in new interconnection assets or interconnection transmission alternatives and the replacement or refurbishment of existing ones.

The cost recovered through the BBCs for a BBI is referred to as the BBI's "covered cost" and includes the BBI's capital components (return of and on capital expenditure) and an allocation of Transpower's total operating costs (including overheads).

A BBI's covered cost is allocated between customers broadly in proportion to the positive net private benefit (NPB) each customer is expected to derive from the BBI. That is, the BBC paid by a

customer must reflect the positive NPB that customer is expected to receive from the BBI (if any) relative to all other customers.

The NPB of each BBI is derived by historic load flow analysis (MWh) it is therefore proposed to allocate BBCs on an annual energy consumption basis.

The total befit based charges for each point of supply are:

Gore	\$630,208
Edendale	\$370,599
Invercargill	\$433,580
North Makarewa	\$185,629
	Gore Edendale Invercargill North Makarewa

The Benefit Based charges are applied to customers on the basis of the following allocation:

#### Individual Customers:

The individual GXP BBC is divided by the annual total energy consumption of the GXP, to provide a \$MWh rate for each GXP. Each individual customer's total annual energy consumption (MWh) is then be multiplied by the GXP rate supplying it to calculate the annual BBC. For individual customers this equates to the following charges:

	Per Total Annual	
Point of Supply	MWh	
Gore	\$3.647	
Edendale	\$2.406	
Invercargill (TPCL)	\$1.856	
North Makarewa	\$0.674	

#### **Residential and General customers:**

The total amount of BBC's allocated to the individual customers will be deducted from the total network BBC's, the result is the amount to be allocated to all the residential and general customers. The residential and general customers BBC's amount is then divided by the total annual consumption of the residential and general customers to arrive at a \$/MWh rate. Each residential and general customer load group's average annual consumption (MWh) is then multiplied by the \$/MWh rate to calculate the annual allocation to each ICP in load group, the annual allocation amount is then multiplied by the number of ICP's in the load group to calculate the BBC to the load group.

After the revenue from the individual customers has been subtracted from the total the remaining residential and general customer charges are as follows:

	Per MWh	
All Points of Supply	\$1.76	

#### 8.1.3 Residual Charge

Residual Charges recover Transpower's remaining revenue that is not recovered through other transmission charges. Residual Charges are paid by Transpower load customers only, in proportion to their historic (or, for new load customers, estimated) maximum gross demand.

Gross load excludes contributions from batteries when charging or discharging other than their storage losses.

The initial (baseline) allocations of residual charges are in proportion to Transpower customers' maximum gross demand (kW) at the grid exit point averaged across the four financial years (FYs) from FY 2014/15 to FY 2017/18, i.e., the period 1 July 2014 to 30 June 2018. For a Transpower load customer that did not exist on 1 July 2014, including a new load customer, Transpower estimates maximum gross demand based on the customer's assets and the assets connected to them being fully operational.

Load customers' initial allocations are adjusted annually based on changes in their lagged average gross energy usage (kWh) over the period of four financial years commencing eight financial years ago, e.g., for PY 2023/24 the relevant period is from FY 2015/16 to FY 2018/19.

Gore	\$1,639,413
Edendale	\$1,604,590
Invercargill	\$1,613,140
North Makarewa	\$2,919,104

The annual Residual charge for TPCL by GXP are:

For individual customers the allocation of the Residual Charge is calculated in the same method as Transpower allocates the residual charge to TPCL as described above to determine an average gross demand and lagged average energy usage. For individual customers that were not active during the baseline allocations or are new customers the initial average gross demand and lagged average energy will be estimated as if it was fully operation during the baseline period. The estimate is based on similar sized businesses average gross demand. The estimates may be adjusted following the recording of actual demand levels through half-hour metered data. TPCL may alter an individual customers' average gross demand and lagged average energy should a major repurpose of the ICP occur.

For individual customers this equates to the following charge:

	Per kVA Average Gross Demand
All Points of Supply	\$53.47

For residential and general groups, the total amount of residual charge allocated to the individual customers is deducted from the total network residual charge, the result is the amount to be allocated to all the residential and general groups. This resultant amount is then divided by the total peak demand of the residential and general customer groups to calculate a \$/kW rate. Each residential and general load group's average after diversity maximum demand is then multiplied by the \$/kW rate to calculate the annual allocation to each ICP in load group, the annual allocation amount is then multiplied by the number of ICP's in the load group to calculate the residual amount to the load group.

After the revenue from the individual customers has been subtracted from the total the remaining residential and general group customer charges are:

	Per kVA After Diversity Maximum Demand
All Points of Supply	\$42.52

#### 8.1.4 Transitional Cap

The Transitional Cap applies to distributors and grid-connected consumers' BBCs for the seven historic (pre-July 2019) BBIs and residual charges and caps those charges relative to the distributors or grid-connected consumer's interconnection and HVDC charges for PY 2019/20. This is not a cap on total transmission charges. The cap is funded by distributors.

The Transitional cap is allocated to customers based on their share of the overall Benefit Based and Residual Charges.

Gore	\$8,752
Edendale	\$7,617
Invercargill	\$7 <i>,</i> 893
North Makarewa	\$11,973

The annual Transitional Cap for TPCL by GXP is:

For individual customers the sum of the annual BBC and RC are divided by the sum of the total GXP's BBC and RC, this percentage is then multiplied by the annual Transitional Cap amount for the GXP to calculate the annual Transitional Cap charge.

For the residential and general customers, once total amount of Transitional Cap allocated to the individual customers is deducted from the total network Transitional Cap charge, the result is the amount to be allocated to all the residential and general customers. The sum of the annual BBC and residual charge for each load group customer is divided by the sum of the total benefit based charge and residual charge for the network, this percentage is then multiplied by the annual Transitional Cap amount for the network to calculate the annual Transitional Cap charge for each customer, the annual allocation amount is then multiplied by the number of ICP's in the load group to calculate the residual amount for the load group.

#### 8.1.5 Recovery of Transpower Charges

The new Transpower pricing methodology charges are fixed in nature and not intended to influence customer network use decisions, therefore Transpower charges will be recovered through fixed charges where possible.

For residential and general customers, the total Transpower charges are recovered through the fixed daily charge,

The Transpower amount of the fixed daily charge for the residential and general customer groups is outlined in the table below:
Residential and General Connections				
Contract Capacity Group	Code	Transpower Fixed Charge \$per Day		
TPCI Urban				
Domestic				
Small Domestic (8kVA 1 Phase) - All Peak	UD08P	\$0,1490		
Small Domestic (8kVA 1 Phase) - With Off Peak	UD08Q	\$0.1292		
Standard Domestic (20kVA 1 Phase) - All Peak	UD20P	\$0.3724		
Standard Domestic (20kVA 1 Phase) - With Off Peak	UD20Q	\$0.3231		
10% Fixed Charge Option (8kVA 1 Phase) - All Peak	UDL08P	\$0.1451		
10%Fixed Charge Option (8kVA 1 Phase) - With Off Peak	UDL08Q	\$0.1264		
10% Fixed Charge Option (20kVA 1 Phase) - All Peak	UDL20P	\$0.3442		
10%Fixed Charge Option (20kVA 1 Phase) - With Off Peak	UDL20Q	\$0.2964		
Non-Domestic Single Phase				
Street Lights (1 Phase) per connection	US001L	\$0.0383		
1 kVA 1 Phase - All Peak	US001P	\$0.1927		
8 kVA 1 Phase - All Peak	US008P	\$0.1490		
8 kVA 1 Phase - With Off Peak	US008Q	\$0.1292		
20 kVA 1 Phase - All Peak	US020P	\$0.3724		
20 kVA 1 Phase - With Off Peak	US020Q	\$0.3231		
Non-Domestic Three Phase				
15 kVA 3 Phase - All Peak	UT015P	\$0.2749		
15 kVA 3 Phase - With Off Peak	UT015Q	\$0.2381		
30 kVA 3 Phase - All Peak	UT030P	\$0.6373		
30 kVA 3 Phase - With Off Peak	UT030Q	\$0.5501		
50 kVA 3 Phase - All Peak	UT050P	\$1.6474		
50 kVA 3 Phase - With Off Peak	UT050Q	\$1.4414		
75 kVA 3 Phase - All Peak	UT075P	\$2.9565		
75 kVA 3 Phase - With Off Peak	UT075Q	\$2.5652		
100 kVA 3 Phase - All Peak	UT100P	\$5.2181		
100 kVA 3 Phase - With Off Peak	UT100Q	\$4.5542		
TPCL Rural				
Small Domestic (8kVA 1 Phase) - All Peak	RD08P	\$0 1490		
	110001	ψυ.1430		

.

Small Domestic (8kVA 1 Phase) - With Off Peak	RD08Q	\$0.1292
Standard Domestic (20kVA 1 Phase) - All Peak	RD20P	\$0.3724
Standard Domestic (20kVA 1 Phase) - With Off Peak	RD20Q	\$0.3231
10% Fixed Charge Option (8kVA 1 Phase) - All Peak	RDL08P	\$0.1451
10%Fixed Charge Option (8kVA 1 Phase) - With Off Peak	RDL08Q	\$0.1264
10% Fixed Charge Option (20kVA 1 Phase) - All Peak	RDL20P	\$0.3442
10%Fixed Charge Option (20kVA 1 Phase) - With Off Peak	RDL20Q	\$0.2964
Non-Domestic Single Phase		
Street Lights (1 Phase) per connection	RS001L	\$0.0383
1 kVA 1 Phase - All Peak	RS001P	\$0.1927
8 kVA 1 Phase - All Peak	RS008P	\$0.1490
8 kVA 1 Phase - With Off Peak	RS008Q	\$0.1292
20 kVA 1 Phase - All Peak	RS020P	\$0.3724
20 kVA 1 Phase - With Off Peak	RS020Q	\$0.3231
Non-Domestic Three Phase		
15 kVA 3 Phase - All Peak	RT015P	\$0.2749
15 kVA 3 Phase - With Off Peak	RT015Q	\$0.2381
30 kVA 3 Phase - All Peak	RT030P	\$0.6373
30 kVA 3 Phase - With Off Peak	RT030Q	\$0.5501
50 kVA 3 Phase - All Peak	RT050P	\$1.6474
50 kVA 3 Phase - With Off Peak	RT050Q	\$1.4414
75 kVA 3 Phase - All Peak	RT075P	\$2.9565
75 kVA 3 Phase - With Off Peak	RT075Q	\$2.5652
100 kVA 3 Phase - All Peak	RT100P	\$5.2181
100 kVA 3 Phase - With Off Peak	RT100Q	\$4.5542

Half hour metered individual customers recover the residual, benefit based and transitional cap charges through the fixed daily charges and the connection charge through the variable line charge.

Currently the recovery of total line charge is on a 50/50 split between fixed and variable charges, TPCL's strategy is to recover more line charge revenue through the fixed daily charge, this will be achieved by increasing the fixed charge percentage each year, this will allow all of the Transpower charges to be recovered through the fixed daily charge over time.

Non half hour metered individual customers have varying levels of recovery of the total line charge through the fixed charge, this is due to the variable line charge price being fixed at the residential and general customers GXP variable line charge price. For these customers the recovery of the Transpower charge through the fixed daily charge is determined by the level of the fixed daily charge. This is now a closed tariff group and customers are being transitioned to other options.

## 8.1.6 Transpower Revenue for Individual Customers

The total Transpower revenue for individual customers grouped by capacity is shown in the following table:

	Transpower			
Consumer	Number	Revenue per	Average	
Capacity	of	Consumer	Line	
kVA	Connections	Group	Charge	
30	1	\$686	\$686	
50	19	\$37,540	\$1,976	
75	9	\$13,916	\$1,546	
100	30	\$51,231	\$1,708	
150	61	\$171,865	\$2,817	
200	57	\$206,583	\$3,624	
300	40	\$295,961	\$7,399	
500	23	\$201,735	\$8,771	
750	13	\$243,956	\$18,766	
1000	6	\$212,320	\$35,387	
1250	2	\$99,404	\$49,702	
1500	5	\$115,930	\$23,186	
1800	1	\$61,260	\$61,260	
2000	2	\$142,538	\$71,269	
3000	1	\$9,317	\$9,317	
3500	1	\$81,429	\$81,429	
4000	1	\$213,362	\$213,362	
4500	1	\$4,457	\$4,457	
5000	1	\$166,477	\$166,477	
9000	1	\$158,076	\$158,076	
10000	1	\$558,208	\$558,208	
13000	1	\$461,214	\$461,214	
30200	1	\$1,802,820	\$1,802,820	

### 8.1.7 Transpower Revenue for Group Customers

The total Transpower revenue for group customers is shown in the following table.

Consumer	Code	Number of	Transpower	Transpower
Capacity		Connections	Charge	Revenue per
				Consumer
				Group
TPCL Urban				
Residential Standard				
Small Residential (8kVA 1 Phase) - All Peak	UD08P	104	\$55	\$5,688
Small Residential (8kVA 1 Phase) - With Off Peak	UD08Q	203	\$47	\$9,595
Residential (15kVA 1 Phase) - All Peak	UD20P	2,182	\$136	\$297,455
Residential (15kVA 1 Phase) - With Off Peak	UD20Q	7,407	\$118	\$875,897
Residential Low Fixed Charge Option (15kVA 1 Phase) - All Peak	UDL20P	1,639	\$126	\$206,442
Residential Low Fixed Charge Option (15kVA 1 Phase) - With Off Peak	UDL20Q	5,259	\$108	\$570,519
Residential Low Fixed Charge Option (8kVA 1 Phase) - All Peak	UDL08P	68	\$53	\$3,620
Residential Low Fixed Charge Option (8kVA 1 Phase) - With Off Peak	UDL08Q	138	\$46	\$6,401
General Single Phase				
Street Lights (1 Phase)	US001L	5,381	\$14	\$75,497
1 kVA 1 Phase - All Peak	US001P	30	\$71	\$2,115
8 kVA 1 Phase - All Peak	US008P	244	\$55	\$13,294
8 kVA 1 Phase - With Off Peak	US008Q	14	\$47	\$662
15 kVA 1 Phase - All Peak	US020P	377	\$136	\$51,317

15 kVA 1 Phase - With Off Peak	US020Q	95	\$118	\$11,235
General Three Phase				
15 kVA 3 Phase - All Peak	UT015P	108	\$101	\$10,831
15 kVA 3 Phase - With Off Peak	UT015Q	12	\$87	\$1,060
30 kVA 3 Phase - All Peak	UT030P	548	\$233	\$127,898
30 kVA 3 Phase - With Off Peak	UT030Q	92	\$201	\$18,490
50 kVA 3 Phase - All Peak	UT050P	324	\$603	\$195,551
50 kVA 3 Phase - With Off Peak	UT050Q	79	\$528	\$41,588
75 kVA 3 Phase - All Peak	UT075P	99	\$1,082	\$106,584
75 kVA 3 Phase - With Off Peak	UT075Q	17	\$939	\$15,648
100 kVA 3 Phase - All Peak	UT100P	26	\$1,910	\$49,655
100 kVA 3 Phase - With Off Peak	UT100Q	3	\$1,667	\$5,000

# **TPCL Rural**

### Residential

Small Residential (8kVA 1 Phase) - All Peak	RD08P			
Small Residential (8kVA 1 Phase) - With Off Peak	RD08Q			
Residential (15kVA 1 Phase) - All Peak	RD20P	121	\$55	\$6,570
Residential (15kVA 1 Phase) - With Off Peak	RD20Q	96	\$47	\$4,525
Residential Low Fixed Charge Option (15kVA 1 Phase) - All Peak	RDL20P	2,386	\$136	\$325,170
Residential Low Fixed Charge Option (15kVA 1 Phase) - With Off Peak	RDL20Q	5.469	\$118	\$646.708
Residential Low Fixed Charge Option (8kVA 1 Phase) - All Peak	RDL08P	846	\$126	\$106.560
Residential Low Fixed Charge Option (8kVA 1 Phase) - With Off Peak	RDL08Q	1 969	\$108	\$213 569
		39	\$53	\$2,080

General Single Phase		25	\$46	\$1,165
Street Lights (1 Phase)	RS001L			
1 kVA 1 Phase - All Peak	RS001P			
8 kVA 1 Phase - All Peak	RS008P	1,161	\$14	\$16,289
8 kVA 1 Phase - With Off Peak	RS008Q	139	\$71	\$9,790
15 kVA 1 Phase - All Peak	RS020P	1,132	\$55	\$61,717
15 kVA 1 Phase - With Off Peak	RS020Q	26	\$47	\$1,230
		1,649	\$136	\$224,693
General Three Phase		348	\$118	\$41,096
15 kVA 3 Phase - All Peak	RT015P			
15 kVA 3 Phase - With Off Peak	RT015Q			
30 kVA 3 Phase - All Peak	RT030P	351	\$101	\$35,310
30 kVA 3 Phase - With Off Peak	RT030Q	19	\$87	\$1,656
50 kVA 3 Phase - All Peak	RT050P	1,823	\$233	\$425,212
50 kVA 3 Phase - With Off Peak	RT050Q	411	\$201	\$82,686
75 kVA 3 Phase - All Peak	RT075P	658	\$603	\$396,729
75 kVA 3 Phase - With Off Peak	RT075Q	510	\$528	\$268,870
100 kVA 3 Phase - All Peak	RT100P	100	\$1,082	\$108,027
100 kVA 3 Phase - With Off Peak	RT100Q	39	\$939	\$36,459

#### 8.2 Subtransmission Charges

Subtransmission charges are based on the subtransmission costs (66kV and 33kV network) and the zone substation costs.

There are two components making up the subtransmission charges:

- (a) Supply charge
- (b) Maintenance charge

#### 8.1.4 Supply Charge

The subtransmission network was broken up into its constituent components including every line and every zone substation. These components were categorised, i.e. 66,000 and 33,000V, indoor and outdoor, size, number of transformers, circuit breakers, length of line etc.

Values for these subtransmission network components were based on the replacement value costs. These values were then amended by the ratio of the overall replacement cost to the asset value of the network. The appropriate share of the supply charge was allocated to each zone substation on this basis.

The share of the subtransmission lines by each zone substation was determined using the superposition theorem and calculating load flows through the interconnected mesh network.

The total supply charge for all TPCL's zone substations is \$19,022,697

The supply charge for TPCL is allocated across all customers connected to each zone substation on the following basis:

Peak Demand	70%	
Peak Energy	20%	
Winter Day Energy	1	.0%

#### 8.1.5 Maintenance Charge

The subtransmission maintenance charges for TPCL total \$3,313,246

These maintenance charges are allocated across the customers on the following basis:

Total Energy	50%
--------------	-----

Peak Demand 50%

#### 8.1.6 Total Subtransmission Charges

The total subtransmission charges allocated to each zone substation are shown in the following table.

Zone	Total	Total
Substation	Supply	Maintenance
	Charge	Charge
Awarua	\$220,918	\$38,478
Bluff	\$536,755	\$93,488
Centre Bush	\$466,271	\$81,212
Conical Hills	\$391,441	\$68,179
Dipton	\$392,943	\$68,440
Edendale	\$382,571	\$74,037
Glenham	\$303,073	\$52,787
Gorge Road	\$427,303	\$74,425
Hillside	\$331,959	\$57,818
Kelso	\$664,783	\$115,788
Kennington	\$258,692	\$45,057
Lumsden	\$798,628	\$139,100
Makarewa	\$419,554	\$73,075
Athol	\$837,223	\$145,822
Mataura	\$416,027	\$72,461
Monowai	\$196,132	\$34,161
Mossburn	\$880,264	\$161,388
NZMP	\$462,011	\$84,705
North Gore	\$316,435	\$55,115
Ohai	\$597,032	\$92,846
Orawia	\$735,651	\$116,483
Otatara	\$348,811	\$60,754
Otautau	\$469,706	\$74,373
White Hill	\$91,022	\$15,854
Riversdale	\$624,308	\$108,738
Riverton	\$552,652	\$96,257
Seaward Bush	\$331,504	\$57,739
South Gore	\$282,543	\$49,211
Te Anau	\$1,670,974	\$291,039
Tokanui	\$447,831	\$78,000
Underwood	\$579,646	\$100,959
Waikiwi	\$641,624	\$111,754
Waikaka	\$380,664	\$66,301
Winton	\$877,402	\$152,820

Colyer RD	\$712,584	\$124,113
Hedgehope	\$576,727	\$100,450
Isla Bank	\$459,427	\$80,020
ICC46	\$48,377	\$13,647

## 8.1.7 Subtransmission Charges for Individual Customers above 100 kVA

The subtransmission charges relating to each zone substation are shown in the following table.

Zone	Supply	Supply	Supply	Maintenance	Maintenance
Substation	Charge	Charge	Charge	Charge	Charge
	per kVA Winter	per Winter	per Winter	per Commercial	per kVA Winter
	Peak Demand	Peak MWh	Day MWh	Total MWh	Peak Demand
Awarua	\$84.78	\$31.62	\$8.59	\$0.97	\$10.55
Bluff	\$74.90	\$39.17	\$9.65	\$1.71	\$9.32
Centre Bush	\$89.47	\$88.29	\$23.36	\$3.72	\$11.13
Conical Hills	\$85.84	\$43.77	\$11.70	\$2.48	\$10.68
Dipton	\$188.49	\$253.65	\$62.69	\$11.32	\$23.45
Edendale	\$44.35	\$31.24	\$8.27	\$1.34	\$6.13
Glenham	\$162.89	\$126.28	\$33.78	\$6.03	\$20.27
Gorge Road	\$126.14	\$136.89	\$36.36	\$5.65	\$15.69
Hillside	\$257.36	\$181.28	\$47.18	\$8.23	\$32.02
Kelso	\$113.38	\$63.84	\$17.13	\$3.17	\$14.11
Kennington	\$27.77	\$22.02	\$8.42	\$1.25	\$3.45
Lumsden	\$159.62	\$109.86	\$28.52	\$4.84	\$19.86
Makarewa	\$76.85	\$33.95	\$8.99	\$1.51	\$9.56
Athol	\$321.29	\$252.86	\$62.94	\$14.72	\$39.97
Mataura	\$45.16	\$31.54	\$8.56	\$1.22	\$5.62
Monowai	\$376.33	\$372.04	\$96.03	\$17.66	\$46.82
Mossburn	\$307.10	\$266.60	\$70.32	\$13.09	\$40.22
NZMP	\$13.43	\$5.81	\$13.53	\$0.36	\$1.76
North Gore	\$27.60	\$13.22	\$3.47	\$0.66	\$3.43
Ohai	\$179.70	\$102.87	\$26.94	\$4.27	\$19.96
Orawia	\$182.73	\$110.24	\$29.68	\$4.97	\$20.67
Otatara	\$59.49	\$37.19	\$10.27	\$2.08	\$7.40
Otautau	\$97.43	\$41.17	\$11.23	\$1.78	\$11.02
White Hill	\$116.43	\$517.98	\$85.31	\$15.70	\$14.49
Riversdale	\$90.41	\$69.55	\$18.26	\$2.96	\$11.25
Riverton	\$81.57	\$42.80	\$11.31	\$2.05	\$10.15
Seaward Bush	\$32.62	\$12.14	\$3.09	\$0.57	\$4.06
South Gore	\$19.24	\$11.37	\$2.94	\$0.49	\$2.39
Te Anau	\$204.54	\$106.75	\$27.49	\$4.94	\$25.45
Tokanui	\$202.19	\$256.22	\$62.93	\$11.70	\$25.15
Underwood	\$39.76	\$25.13	\$6.66	\$0.90	\$4.95
Waikiwi	\$44.77	\$18.20	\$4.92	\$0.94	\$5.57
Waikaka	\$317.57	\$200.77	\$74.67	\$11.46	\$39.51
Winton	\$64.44	\$26.46	\$8.68	\$1.39	\$8.02

Colyer RD	\$59.62	\$41.61	\$12.75	\$1.27	\$7.42
Hedgehope	\$264.27	\$249.43	\$49.64	\$18.26	\$32.88
Isla Bank	\$176.40	\$496.75	\$128.90	\$36.36	\$21.95

### 8.1.8 Subtransmission Charges for Group Customers

After the revenue from the individual customers has been subtracted from the total the remaining group customer charges are as follows:

	Supply	Supply	Supply	Maintenance	Maintenance
	Charge per	Charge	Charge	Charge	Charge per
	kVA	per	per Winter	per Domestic	kVA Winter
	Peak Demand	Peak MWh	Day MWh	Total MWh	Peak Demand
Residential and General	\$95.3548	\$59.9006	\$13.0943	\$2.7979	\$12.8763

### 8.2 Distribution charges

Distribution charges are based on the distribution costs, which include 11kV and 400V line and cables and distribution substations and transformers.

All individual customers have location based distribution charges. These customers pay their distribution charges based on four factors - the radial distance from the zone substation, the contract capacity of the installation and the number and size of transformers used to supply them.

The residential and general customers have non-locational distribution charges. For these customers the costs of the distribution network are averaged. These customers are identified as belonging to one of two groups, Urban and Rural.

Urban customers are located in the following areas:

Invercargill	Mossburn
Gore	Lumsden
Te Anau	Riversdale
Winton	Manapouri
Mataura	Tapanui
Riverton	Edendale
Otautau	Wyndham
Tuatapere	Wallacetown
Ohai	Otatara
Nightcaps	

The remaining customers are classified as rural.

There are three components making up the distribution charges

- (a) Supply charge
- (b) Maintenance charge

(c) Transformer charge

#### 8.2.1 Supply Charge

The supply charge is the required return on the assets by the shareholder and depreciation.

The total supply charge for TPCL totals \$18,652,291.

The non-locational supply charges are allocated across customers on the following basis:

Contract Capacity	70%
Peak Energy	20%
Winter Day Energy	10%

#### 8.2.2 Maintenance Charge

The maintenance charges for TPCL total \$5,923,810.

The maintenance portion of the non-locational distribution charges is allocated across customers on the following basis:

Total Energy	50%
Contract Capacity	50%

#### 8.2.3 Transformer Charge

The supply and maintenance transformer charges for TPCL total \$7,518,903.

The transformer portion of the distribution charges is allocated across consumers on the following basis:

> Number of transformers and transformer capacity 100%

#### 8.2.4 Locational Individual Distribution Charges

- (a) **Distribution Supply charge** \$3.68 per kVA km Urban \$0.81 per kVA km Rural
- (b) **Distribution Supply charge**
- (c) Distribution Transformer charge \$385 per Transformer
- (d) Distribution Maintenance charge \$2,251 per km Urban \$967 per km Rural
- (e) Distribution Maintenance charge
- (f) Maintenance Transformer charge
- Maintenance Transformer charge (g)
- \$861 per Transformer for capacity >=75kVA
- \$50.15 per Transformer for capacity <75kVA

The Transformer charge of \$85 per transformer is multiplied by a price ratio depending on the size of the transformer. The ratios for the different sized transformers are shown below.

Transformer Size	Ratio applied
15kVA Transformer	1.00
30kVA Transformer	1.44
50kVA Transformer	1.88
75kVA Transformer	2.30
100kVA Transformer	2.80
150kVA Transformer	3.50
200kVA Transformer	4.40
300kVA Transformer	5.16
500kVA Transformer	7.20
750kVA Transformer	8.80
1,000kVA Transformer	9.96
1,250kVA Transformer	13.20
1,500kVA Transformer	15.60

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 maintenance charges is multiplied by a factor of 70%.

#### 8.2.5 Distribution Charges for Residential and General Customers

After the revenue from the individual customers has been subtracted from the total, the remaining residential and general customer charges are as follows:

#### TPCL Urban

(a)	Distribution Supply charge	\$8.31 per kVA Contract Capacity
(b)	Distribution Supply charge	\$35.58 per Winter Peak MWh
(c)	Distribution Supply charge	\$7.58 per Winter Day MWh
(d)	Distribution Maintenance charge	\$1.45 per Domestic Total MWh
(e)	Distribution Maintenance charge	\$1.45 per Commercial Total MWh
(f)	Distribution Maintenance charge	\$1.00 per kVA Contract Capacity
(g)	Distribution Transformer charge	\$12.15 per kVA AD Transformer capacity
TPCL Rı	ıral	
(a)	Distribution Supply charge	\$48.71 per kVA Contract Capacity
(b)	Distribution Supply charge	\$126.77 per Winter Peak MWh
(c)	Distribution Supply charge	\$27.93 per Winter Day MWh
(d)	Distribution Maintenance charge	\$10.41 per Domestic Total MWh
(e)	Distribution Maintenance charge	\$10.41 per Commercial Total MWh
(f)	Distribution Maintenance charge	\$11.40 per kVA Contract Capacity
(g)	Distribution Transformer charge	\$12.15 per kVA AD Transformer capacity

The model applies an 8% discount for rural single-phase group customers and a 10% discount for urban single-phase group customers compared to three phase customers of similar size. This is to reflect the reduced investment in network assets for single-phase customers.

### 8.3 Overheads

The overhead charges are based on 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.

These charges are split equally over the total customer base.

The total overhead costs are \$4,983,683

The charge per customer is \$133.30

#### 8.4 Power Factor Charge

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

Individual and general customers may have a data logger installed to assess their power factor. If a customer has a power factor of less than 0.95 lagging and after a period of 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.

TPCL works with customers to improve their power factor by facilitating education forums on how to manage power factor in conjunction with customers electricians and power engineering consultants.

# 8.5 TPCL Charges

#### 8.5.1 TPCL Revenue for Individual Customers

The total TPCL revenue for individual customers grouped by capacity is shown in the following table.

Consumer	Subtransmission	Distribution	Overhead	Total
Capacity	Charge	Charge	Charge	TPCL
kVA				Charge
30	\$852.67	\$1,809.05	\$133.30	\$2,795.01
50	\$62,317.80	\$24,445.05	\$2,532.63	\$89,295.48
75	\$18,561.87	\$14,730.83	\$1,199.67	\$34,492.37
100	\$91,894.49	\$84,984.18	\$3,998.90	\$180,877.57
150	\$226,304.06	\$210,426.05	\$8,131.09	\$444,861.19
200	\$437,395.50	\$226,515.32	\$7,597.90	\$671,508.72
300	\$408,313.46	\$163,106.66	\$5,331.86	\$576,751.99
500	\$1,503,502.00	\$120,270.71	\$2,799.23	\$1,626,571.94
750	\$213,938.60	\$57,570.41	\$1,732.86	\$273,241.87
1000	\$181,653.08	\$40,740.53	\$799.78	\$223,193.38
1250	\$64,792.88	\$17,230.48	\$266.59	\$82,289.96
1500	\$126,361.01	\$59,509.59	\$666.48	\$186,537.08
1800	\$76,052.96	\$22,867.93	\$133.30	\$99,054.18
2000	\$145,379.18	\$8,725.81	\$266.59	\$154,371.58
3000	\$14,679.09	\$1,101.32	\$133.30	\$15,913.71
3500	\$185,108.32	\$16,541.60	\$133.30	\$201,783.22
4000	\$103,001.36	\$869,788.99	\$133.30	\$972,923.65
4500	\$6,004.92	\$1,858.76	\$133.30	\$7,996.97
5000	\$214,911.18	\$3,096.32	\$133.30	\$218,140.80
6000	\$572,140.42	\$67,586.49	\$133.30	\$639,860.21
10000	\$589,831.33	\$5,109.13	\$133.30	\$595,073.76
13000	\$232,491.35	\$0.00	\$0.00	\$232,491.35
30200	\$452,635.12	\$0.00	\$0.00	\$452,635.12

### 8.5.2 TPCL Revenue for Group Customers

The total TPCL revenue for group customers is shown in the following table.

Consumer	Code	Number of	Subtransmission	Distribution	Overheads	Total
Capacity		Connections	Charge	Charge		TPCL
						Revenue
TPCL Urban						
Residential Standard						
Small Residential (8kVA 1 Phase) - All Peak	UD08P	104	\$15,448.76	\$14,688.99	\$13,907.27	\$44,045.02
Small Residential (8kVA 1 Phase) - With Off Peak	UD08Q	203	\$25,620.85	\$24,297.96	\$27,036.98	\$76,955.79
Residential (15kVA 1 Phase) - All Peak	UD20P	2,182	\$807,851.77	\$768,121.58	\$290,897.48	\$1,866,870.83
Residential (15kVA 1 Phase) - With Off Peak	UD20Q	7,407	\$2,338,876.47	\$2,218,112.11	\$987,260.82	\$5,544,249.40
Residential Low Fixed Charge Option (15kVA 1 Phase) - All Peak	UDL20P	1,639	\$520,079.27	\$527,106.67	\$218,406.38	\$1,265,592.32
Residential Low Fixed Charge Option (15kVA 1 Phase) - With Off Peak	UDL20Q	5,259	\$1,422,329.37	\$1,438,977.63	\$701,006.50	\$3,562,313.49
Residential Low Fixed Charge Option (8kVA 1 Phase) - All Peak	UDL08P	68	\$9,396.25	\$9,189.24	\$9,086.38	\$27,671.87
Residential Low Fixed Charge Option (8kVA 1 Phase) - With Off Peak	UDL08Q	138	\$16,813.47	\$16,194.77	\$18,439.35	\$51,447.59
General Single Phase						
Street Lights (1 Phase)	US001L	5,381	\$188,086.36	\$105,609.08	\$14,345.37	\$308,040.81
1 kVA 1 Phase - All Peak	US001P	30	\$6,491.73	\$3,402.22	\$3,998.90	\$13,892.84
8 kVA 1 Phase - All Peak	US008P	244	\$36,104.69	\$34,329.06	\$32,502.14	\$102,935.90
8 kVA 1 Phase - With Off Peak	US008Q	14	\$1,768.41	\$1,677.10	\$1,866.15	\$5,311.66
15 kVA 1 Phase - All Peak	US020P	377	\$139,372.01	\$132,517.69	\$50,186.15	\$322,075.85

15 kVA 1 Phase - With Off Peak	US020Q	95	\$29,999.77	\$28,450.77	\$12,663.17	\$71,113.71
General Three Phase						
15 kVA 3 Phase - All Peak	UT015P	108	\$28,994.85	\$27,907.17	\$14,351.59	\$71,253.61
15 kVA 3 Phase - With Off Peak	UT015Q	12	\$2,794.47	\$2,683.09	\$1,621.77	\$7,099.34
30 kVA 3 Phase - All Peak	UT030P	548	\$330,582.22	\$324,202.09	\$73,090.94	\$727,875.25
30 kVA 3 Phase - With Off Peak	UT030Q	92	\$47,194.08	\$46,187.95	\$12,241.07	\$105,623.09
50 kVA 3 Phase - All Peak	UT050P	324	\$573,626.41	\$500,617.87	\$43,232.51	\$1,117,476.79
50 kVA 3 Phase - With Off Peak	UT050Q	79	\$119,073.42	\$103,579.82	\$10,508.21	\$233,161.46
75 kVA 3 Phase - All Peak	UT075P	99	\$289,469.84	\$266,354.05	\$13,129.71	\$568,953.60
75 kVA 3 Phase - With Off Peak	UT075Q	17	\$41,782.99	\$38,348.48	\$2,221.61	\$82,353.08
100 kVA 3 Phase - All Peak	UT100P	26	\$142,421.16	\$124,795.94	\$3,465.71	\$270,682.81
100 kVA 3 Phase - With Off Peak	UT100Q	3	\$14,029.84	\$12,256.15	\$399.89	\$26,685.88

# **TPCL Rural**

## Residential

Small Residential (8kVA 1 Phase) - All Peak	RD08P					
Small Residential (8kVA 1 Phase) - With Off Peak	RD08Q					
Residential (15kVA 1 Phase) - All Peak	RD20P	121	\$17,842.58	\$51,092.03	\$16,062.23	\$84,996.85
Residential (15kVA 1 Phase) - With Off Peak	RD20Q	96	\$12,084.12	\$34,828.17	\$12,752.04	\$59,664.32
Residential Low Fixed Charge Option (15kVA 1 Phase)						
- All Peak	RDL20P	2,386	\$883,121.29	\$2,528,808.38	\$318,001.11	\$3,729,930.79
Residential Low Fixed Charge Option (15kVA 1 Phase)						
- With Off Peak	RDL20Q	5,469	\$1,726,881.25	\$4,977,121.48	\$728,932.12	\$7,432,934.86
Residential Low Fixed Charge Option (8kVA 1 Phase)						
- All Peak	RDL08P	846	\$268,451.05	\$785,972.26	\$112,735.55	\$1,167,158.86
Residential Low Fixed Charge Option (8kVA 1 Phase) -						
With Off Peak	RDL08Q	1,969	\$532,438.18	\$1,565,492.82	\$262,416.45	\$2,360,347.45
		39	\$5,398.82	\$15,681.28	\$5,220.78	\$26,300.88
		25	\$3,058.84	\$8,857.63	\$3,354.63	\$15,271.09

THEPOWERCON	PANYLTD
-------------	---------

General Single Phase						
Street Lights (1 Phase)	RS001L					
1 kVA 1 Phase - All Peak	RS001P	1,161	\$40,581.35	\$81,356.78	\$3,095.15	\$125,033.28
8 kVA 1 Phase - All Peak	RS008P	139	\$30,042.27	\$61,188.64	\$18,506.00	\$109,736.92
8 kVA 1 Phase - With Off Peak	RS008Q	1,132	\$167,616.59	\$479,968.33	\$150,891.68	\$798,476.60
15 kVA 1 Phase - All Peak	RS020P	26	\$3,284.18	\$9,465.50	\$3,465.71	\$16,215.39
15 kVA 1 Phase - With Off Peak	RS020Q	1,649	\$610,238.42	\$1,747,411.19	\$219,739.34	\$2,577,388.95
34			\$109,735.99	\$316,274.98	\$46,320.55	\$472,331.51
General Three Phase					1	
15 kVA 3 Phase - All Peak	RT015P					
15 kVA 3 Phase - With Off Peak	RT015Q	351	\$94,525.00	\$271,802.72	\$46,787.09	\$413,114.80
30 kVA 3 Phase - All Peak	RT030P	19	\$4,363.97	\$12,624.73	\$2,532.63	\$19,521.34
30 kVA 3 Phase - With Off Peak	RT030Q	1,823	\$1,099,060.29	\$3,161,095.58	\$242,999.59	\$4,503,155.46
50 kVA 3 Phase - All Peak	RT050P	411	\$211,045.77	\$610,102.75	\$54,740.45	\$875,888.97
50 kVA 3 Phase - With Off Peak	RT050Q	658	\$1,163,760.05	\$3,203,547.47	\$87,709.12	\$4,455,016.64
75 kVA 3 Phase - All Peak	RT075P	510	\$769,823.53	\$2,138,328.11	\$67,936.80	\$2,976,088.44
75 kVA 3 Phase - With Off Peak	RT075Q	100	\$293,388.21	\$816,015.19	\$13,307.44	\$1,122,710.84
100 kVA 3 Phase - All Peak	RT100P	39	\$97,354.36	\$272,621.46	\$5,176.35	\$375,152.17
100 kVA 3 Phase - With Off Peak	RT100Q	30	\$165,245.06	\$451,823.54	\$4,021.11	\$621,089.72

#### 8.6 Loss Constraint Excess Payment

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 allocated each month to the retailers on the basis of total energy consumption for the month in which the rebate applied.

#### 8.7 Target Revenue Requirement Summary

Below is a summary of our projected revenue for both Transmission costs and distribution price components broken down by the two customer group categories for the 2023-24 year. We also outline the change in revenue compared with the previous year:

	Group customers	Individual customers	Total
2023-24 Revenue			
Distribution	\$53,707,860	\$7,982,661	\$61,690,521
Transmission	\$5,780,924	\$5,310,284	\$11,091,208
Total	\$55,931,460	\$13,360,126	\$72,781,729
Previous year			
Distribution	\$48,684,251	\$7,819,915	\$56,504,166
Transmission	\$7,247,209	\$5,540,211	\$12,787,420
Total	\$55,931,460	\$13,360,126	\$69,291,586

The changes in revenues are based on changes to our costs and our allocation of these costs to the customer groups. Other factors that impact on the allocation of costs relate to changes in quantities and individual customers profile changes as well as contractual changes.

Transmission changes relate to introduction of Transpower's new pricing methodology and the removal of the avoided cost of transmission payments to distributed generators, which has decreased transmission charges.

Distribution revenue changes reflect changes in operation and maintenance costs and an increased return.

#### Line Charge Revenue for Individual Customers

The line charge revenue for individual customers grouped by capacity is shown in the following table.

Consumer	Number	Line Charge	Average
Capacity	of	Revenue per	Line
kVA	Connections	Consumer	Charge
		Group	
30	1	\$3.481	\$3.481
50	19	\$126,835	\$6,676
75	9	\$48,409	\$5,379
100	30	\$232,108	\$7,737
150	61	\$617,927	\$10,130
200	57	\$878,504	\$15,412
300	40	\$872,713	\$21,818
500	23	\$1,828,307	\$79,492
750	13	\$517,198	\$39,784
1000	6	\$435,514	\$72,586
1250	2	\$181,694	\$90,847
1500	5	\$302,467	\$60,493
1800	1	\$160,314	\$160,314
2000	2	\$296,909	\$148,455
3000	1	\$25,230	\$25,230
3500	1	\$283,212	\$283,212
4000	1	\$1,387,571	\$1,387,571
4500	1	\$12,454	\$12,454
5000	1	\$384,618	\$384,618
9000	1	\$1,336,125	\$1,336,125
10000	1	\$1,153,282	\$1,153,282
13000	1	\$693,705	\$693,705
30200	1	\$2,255,455	\$2,255,455

#### 8.7.1 Line Charge Revenue for Group Customers

The line charge revenue for group customers is shown in the following table.

Consumer	Code	Number of	Line Charge				
Capacity		Connections	Revenue per				
			Consumer				
			Group				
TPCL Urban							
Residential Standard							
Small Residential (8kVA 1 Phase) - All Peak	UD08P	104	\$49,733				
Small Residential (8kVA 1 Phase) - With Off Peak	UD08Q	203	\$86,551				
Residential (15kVA 1 Phase) - All Peak	UD20P	2,182	\$2,164,326				
Residential (15kVA 1 Phase) - With Off Peak	UD20Q	7,407	\$6,420,147				
- All Peak	UDL20P	1,639	\$1,472,034				
Residential Low Fixed Charge Option (15kVA 1 Phase) - With Off Peak	UDL20Q	5,259	\$4,132,833				
Residential Low Fixed Charge Option (8kVA 1 Phase) - All Peak	UDL08P	68	\$31,292				
Residential Low Fixed Charge Option (8kVA 1 Phase) - With Off Peak	UDL08Q	138	\$57,849				
General Single Phase							
Street Lights (1 Phase)	US001L	5,381	\$383,538				
1 kVA 1 Phase - All Peak	US001P	30	\$16,008				
8 kVA 1 Phase - All Peak	US008P	244	\$116,230				
8 kVA 1 Phase - With Off Peak	US008Q	14	\$5,974				
15 kVA 1 Phase - All Peak	US020P	377	\$373,393				
15 kVA 1 Phase - With Off Peak	US020Q	95	\$82,348				
General Inree Phase							
15 kVA 3 Phase - All Peak	UT015P	108	\$82,085				
15 kVA 3 Phase - With Off Peak	UT015Q	12	\$8,160				
30 kVA 3 Phase - All Peak	UT030P	548	\$855,773				
30 kVA 3 Phase - With Off Peak	UT030Q	92	\$124,113				
50 kVA 3 Phase - All Peak	UT050P	324	\$1,313,028				
50 kVA 3 Phase - With Off Peak	UT050Q	79	\$274,749				
75 kVA 3 Phase - All Peak	UT075P	99	\$675,538				
75 kVA 3 Phase - With Off Peak	UT075Q	17	\$98,001				
100 kVA 3 Phase - All Peak	UT100P	26	\$320,338				
100 kVA 3 Phase - With Off Peak	UT100Q	3	\$31,686				

# THEPOWERCOMPANYLTD 2023 Line Pricing Methodology

Consumer	Code	Number of	Line Charge
Capacity		Connections	Revenue per
			Consumer
			Group
TPCL Rural			
Residential	1		
Small Residential (8kVA 1 Phase) - All Peak	RD08P	121	\$91,567
Small Residential (8kVA 1 Phase) - With Off Peak	RD08Q	96	\$64,190
Residential (20kVA 1 Phase) - All Peak	RD20P	2,386	\$4,055,100
Residential (20kVA 1 Phase) - With Off Peak	RD20Q	5,469	\$8,079,643
Residential Low Fixed Charge Option (20kVA 1 Phase) - All Peak	RDL20P	846	\$1,273,718
Residential Low Fixed Charge Option (20kVA 1 Phase) - With Off Peak	RDI 20Q	1 969	\$2 573 917
Residential Low Fixed Charge Option (8kVA 1 Phase)		20	¢00 201
Residential Low Fixed Charge Option (8kVA 1 Phase) -	RDLUOF	39	\$20,30T
With Off Peak	RDL08Q	25	\$16,436
General Single Phase			
Street Lights (1 Phase)	RS001L	1,161	\$141,322
1 kVA 1 Phase - All Peak	RS001P	139	\$119,527
8 kVA 1 Phase - All Peak	RS008P	1,132	\$860,194
8 kVA 1 Phase - With Off Peak`	RS008Q	26	\$17,445
20 kVA 1 Phase - All Peak	RS020P	1,649	\$2,802,082
20 kVA 1 Phase - With Off Peak	RS020Q	348	\$513,427
General Three Phase			
15 kVA 3 Phase - All Peak	RT015P	351	\$448,425
15 kVA 3 Phase - With Off Peak	RT015Q	19	\$21,177
30 kVA 3 Phase - All Peak	RT030P	1,823	\$4,928,367
30 kVA 3 Phase - With Off Peak	RT030Q	411	\$958,575
50 kVA 3 Phase - All Peak	RT050P	658	\$4,851,746
50 kVA 3 Phase - With Off Peak	RT050Q	510	\$3,244,958
75 kVA 3 Phase - All Peak	RT075P	100	\$1,230,738
75 kVA 3 Phase - With Off Peak	RT075Q	39	\$411,611
100 kVA 3 Phase - All Peak	RT100P	30	\$678,703
100 kVA 3 Phase - With Off Peak	RT100Q	9	\$174,357

# 9. HOW FIXED AND VARIABLE PRICES ARE SET

#### **Individual Customers**

The total line charge is split into fixed charges and variable charges. The fixed/variable split is approximately 50:50. With more costs, in particular Transpower costs, being of a fixed nature TPCL will be increasing the fixed charge percentage split of the total line charge to match.

For the individual line charge installations with half hour metering the total line charge is halved to establish the fixed charge per annum. The variable charge is calculated as the remaining charge divided by the number of Day kWh in the customer energy profile to give a variable charge in cents per Day kWh.

In the case of all non-half hour metered individual line charge installations the variable charge is a standard charge GXP rate of \$0.09347 per Peak kWh, \$0.08345 per Shoulder kWh and \$0.01 per Night kWh. The fixed charge is then calculated as the difference between the total charge and the total variable charge. This method of calculating the fixed charge accounts for the fact that some installations have negative fixed charges.

#### **Residential and General Customers**

Last year we introduced installed capacity and TOU variable pricing for the Residential and General customers.

The introduction of TOU variable pricing is a way to move to more cost reflective and service based pricing and is a way of encouraging efficient network use and investment, for the long term benefit of our customers. By efficient use of the network, we mean increasing the use of the network within its existing capacity, including by shifting load outside of peak periods, and incentivising new load to also go onto the network outside of peak periods. More energy delivered across the network without incurring costly upgrades means lower cost per unit of energy delivered for all of us.

TOU pricing periods are:

Peak period, which is defined as 7am to 11am and 5pm to 9pm

Shoulder period, which is defined as 11am to 5pm and 9pm to 11pm

**Night** period11pm to 7am.

TOU enables us to increase prices at times when there is congestion on the network and reduce them at times when there is plenty of capacity. This sends a price signal to transfer load outside of congestion periods and incentivises growth in consumption at times when there is no incremental cost for us to deliver the additional energy.

The application of fixed and variable charges is an application of the line charge to the end-use consumer. The objectives behind the fixed and variable charges are as follows:

 Variable line charge is a compromise between a totally fixed charge that would benefit the large consumer within a load group, and a totally variable charge that would benefit the small consumer within a load group. Due to the uncertain and variable consumption levels of

irrigation supplies and embedded networks, the line charges for these consumer groups are recovered by a 100% fixed line charge.

- For rural group customers with capacities less than 75kVA the fixed line charge is capped at 15% higher than the equivalent urban charge, for capacities greater than or equal to 75kVA the cap is set at 20%.
- As stated above, the fixed and variable charge allows the larger consumer in a load group to
  pay more which reflects to some extent their reduced diversity on the maximum demands
  seen at subtransmission and transmission level. Although the distribution network in the
  vicinity of the premises has to have enough capacity to supply the full capacity of the
  installation, the remainder of the network is designed to take into account the diversity
  between consumer demands. As a general rule, the less energy a consumer uses, the greater
  the diversity, hence the less capital investment required to supply. A totally fixed line charge
  does not take this into account so there would need to be more load sub-groups such as very
  small, small, medium, large and very large domestic consumers besides the existing All Peak
  and With Off Peak categories.
- It is important to note that the variable charge is cheaper during, Shoulder and Night time periods, so residential consumers with large night loads, such as storage or water heating, do not pay extra as this consumption is utilising network assets, the capacity of which is designed on the basis of and costs recovered by the peak load in daytime hours. This encourages better utilisation of the network and less capital investment.
- It is a means whereby the line owner 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 consumer has a production downturn or invests in energy conservation measures, there is an immediate response through a reduction in the variable charges.
- Consumers also have the opportunity to shift load to night time to receive immediate benefits.
- If a consumer is expanding its business, the variable charges mean that the line owner can receive some immediate extra revenue and it can also cushion the increase in line charges for the following year.
- The practical application of a variable component of the line charge for the Residential and General resulted in a necessity for a uniform variable charge and individual fixed charges for each segment. TPCL uses the 'GXP billing" approach for the Residential and General customers, where variable charges are based on electricity volumes measured at the Transpower grid exit points. Quantities are determined by the wholesale electricity market reconciliation process with adjustments for embedded networks and individual customer quantities.

**Loss Factors** - the amount of energy delivered from the Transpower grid exit points through the distribution network to supply electricity to customers is greater than the amount of energy metered at the customers' premises. The difference between these volumes is called 'distribution losses'.



TPCL charges electricity retailers based on the volumes of electricity metered at the grid exit point, this is call grid exit point (GXP) billing. To calculate the energy volumes at the GXP, the customer-metered volumes are multiplied by the loss factor. The electricity retailer therefore must multiply the GXP energy price that TPCL charges them by the loss factor to arrive at the customer energy price for distribution charges.

The loss factors for 2023-24 for residential and general customers are:

Winter Day	1.1350
Winter Night	1.0819
Summer Day	1.1256
Summer Night	1.0592
Winter	May – September
Summer	October – April
Day	7am – 11pm

Loss factors for individual line charge customers are calculated on an individual basis.

## **10. NON-STANDARD CONTRACTS**

TPCL is fielding a large number of enquiries from new and existing business in relation to the decarbonisation of existing load or new load projects. The size of these projects are step changes rather than incremental changes for the network.

In cases like these the standard methodology for the determination of line charges for large customers, 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 these 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.

TPCL contracts directly with four ICP's for the line services provided to their large industrial sites. This is essentially because the value of TPCL's owned assets dedicated to the supply of these sites is significant (in the millions of dollars).

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 principals.

#### **10.1** 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.

#### 10.1.1 Target revenue from ICPs on Non-standard contracts

The total target revenue from ICPs on Non-standard Contracts for the 2023/2024 year is \$6.94m.

## **11. DISTRIBUTED GENERATION**

TPCLs line pricing methodology and Part 6 of the Electricity Industry Participation Code 2010 applies to Distributed Generation connected to the electricity network for varying 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 TPCL.

In other situations, there may be incremental costs incurred by TPCL due to investigation and network modifications required. As with all customers seeking connection to the TPCL 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.

#### 11.1 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 TPCL's electricity network are:

Transaction Types	Capacity
Normal off take Line Charge (paid by the Distributed Generator to TPCL)	All capacities
Capital Contribution (paid by the Distributed Generator to TPCL)	All capacities where incremental costs are incurred by the network
New Investment Agreement charge (paid by the Distributed Generator to TPCL)	For capacities > 500kW
Recovery of Benefit Based Transmission Charges (paid by the Distributed Generator to TPCL)	Where the Distributed Generation is injected into the Transmission Network

#### **11.2 Capital Contributions**

Capital Contributions are calculated in accordance with the published Capital Contribution policy.

#### 11.3 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.

#### 11.4 Benefit Based Transmission Charges

Benefit Based Transmission Charges are recovered from Distributed Generators based on their share of the injected energy into the Transmission Network at the grid exit point they inject into.

#### 11.5 Avoided Transmission Charge (ACOT)

Avoided cost of transmission charge payments were 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 TPM, for the period 1 September to 31 August. With the change this year to the Transpower pricing methodology, the Electricity Authority has removed the unit of measure that was the basis of the ACOT payments to distributed generators.

#### 11.6 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).

The introduction of zero-price export price will ensure that retailers provide export kWh volumes for all small-scale DG connections (ie, solar).

# APPENDIX 1: COMMERCE COMMISSION INFORMATION DISCLOSURE REQUIREMENTS

In the below table, we describe the relevant sections of this methodology where we demonstrate compliance with the key sections of the Commission's information disclosure requirements:

IDD Section	Key sections of methodology demonstrating compliance
2.4.1 (1)	Sections 3 6-9
2.4.1 (2)	Section 3.2
2.4.1 (3)	Sections 10 and 11
(-)	
2.4.1 (4)	Section 3.3
2.4.2	Section 4
2 / 2 (1)	Section 7
2.4.3 (1)	
2.4.3 (2)	Section 5
2.4.3 (3)	Section 6
2.4.5 (5)	
2.4.3 (4)	Section 6
2.4.3 (5) (a), (b)	Section 3 and 8
2.4.3 (6)	Section 3.2
2.4.3 (7)	Sections 7 and 8
2 4 3 (8)	Annendiy 2
2.4.5 (0)	
2.4.4 (1-3)	Section 4
2.4.5 (1) (a) to (c)	Section 10
- (-) (-) (-)	
2.4.5 (2) (a) and (b)	Section 10
2.4.5 (3) (a) and (b)	Section 11



Line Pricing Methodology

2023

## **APPENDIX 2: LINE CHARGE TABLES**

## Line Charge Breakdown for Individual Customers

ICP	Contract	Trans Power	Subtransmission	Distribution	Overhead	Total	Fixed	Variable
Number	Capacity	Charge	Charge	Charge	Charge	Line	Charge	Charge
	kVA					Charge	per annum	per Day MWh
800105TP-315	10,000	\$558,208	\$589,831	\$5,109	\$133.30	\$1,153,282	\$576,641	\$20.33
800107TP-390	200	\$10,931	\$7,138	\$3,416	\$133.30	\$21,617	\$10,809	\$21.94
800116TP-578	3,000	\$9,317	\$14,679	\$1,101	\$133.30	\$25,230	\$12,615	\$16.17
800117TP-93D	750	\$14	\$98	\$275	\$133.30	\$520	\$520	\$0.00
800106TP-FD5	750	\$18,486	\$26,468	\$275	\$133.30	\$45,363	\$22,681	\$74.74
8001275TP-A4C	150	\$2,353	\$6,214	\$2,692	\$133.30	\$11,393	\$5,696	\$24.57
800127TP-EC5	300	\$2,111	\$3,860	\$3,246	\$133.30	\$9,350	\$4,675	\$27.72
800128TP-11B	100	\$11	\$142	\$2,678	\$133.30	\$2,964	\$2,964	\$0.00
800134TP-8A8	5,000	\$166,477	\$214,911	\$3,096	\$133.30	\$384,618	\$192,309	\$24.61
8001365TP-9E5	750	\$30,194	\$32,141	\$392	\$133.30	\$62,860	\$31,430	\$17.09
800139TP-7F3	300	\$7,084	\$5,580	\$2,990	\$133.30	\$15,787	\$7,893	\$41.03
118447TP-ECC	150	\$4,636	\$2,319	\$2,704	\$133.30	\$9,792	\$4,896	\$43.73
6375156TP-218	200	\$428	\$2,655	\$3,926	\$133.30	\$7,142	\$3,571	\$65.11
615297TP-AA3	50	\$2,318	\$3,029	\$2,099	\$133.30	\$7,580	\$3,790	\$45.30
502013TP-4D1	200	\$3,475	\$1,713	\$2,724	\$133.30	\$8,045	\$3,093	\$93.47
382896TP-29B	200	\$260	\$5,904	\$3,590	\$133.30	\$9,887	\$9,887	\$0.00
800186TP-A9F	1,250	\$42,222	\$41,212	\$15,166	\$133.30	\$98,733	\$49,366	\$34.65
244381TP-3EE	75	\$386	\$417	\$1,969	\$133.30	\$2,904	\$2,904	\$0.00
1819183TP-528	150	\$1,173	\$257	\$5,388	\$133.30	\$6,950	\$3,475	\$105.40

66

2023

333040TP-1F2	200	\$3,752	\$13,479	\$4,149	\$133.30	\$21,514	\$21,514	\$0.00
482021TP-8E5	150	\$3,670	\$8,325	\$3,015	\$133.30	\$15,144	\$7,572	\$24.56
643886TP-0F5	200	\$3,328	\$7,380	\$3,049	\$133.30	\$13,890	\$6,945	\$73.97
569933TP-D35	300	\$11,054	\$6,852	\$3,670	\$133.30	\$21,709	\$10,854	\$18.68
329419TP-D0B	300	\$351	\$1,118	\$4,618	\$133.30	\$6,220	\$3,110	\$54.77
100109TP-F16	100	\$3,583	\$6,254	\$3,783	\$133.30	\$13,753	\$6,877	\$71.67
8001315TP-CB8	1,800	\$61,260	\$76,053	\$22,868	\$133.30	\$160,314	\$80,157	\$21.84
8001316TP-078	1,500	\$37,208	\$22,067	\$27,713	\$133.30	\$87,121	\$43,560	\$31.62
391396TP-B94	100	\$1,894	\$2,768	\$3,728	\$133.30	\$8,523	\$1,876	\$93.47
437074TP-48B	75	\$2,488	\$2,067	\$1,292	\$133.30	\$5,980	\$2,990	\$95.33
437078TP-795	50	\$1,584	\$1,049	\$1,014	\$133.30	\$3,780	\$1,890	\$56.51
800155TP-B1D	300	\$7,311	\$2,069	\$6,066	\$133.30	\$15,579	\$7,790	\$18.03
1421365TP-AF8	200	\$1,850	\$6,786	\$5,205	\$133.30	\$13,974	\$13,974	\$0.00
338414TP-B11	100	\$1,232	\$470	\$4,058	\$133.30	\$5,893	\$2,946	\$125.71
5020273TP-22A	300	\$8,328	\$4,445	\$2,953	\$133.30	\$15,859	\$7,929	\$14.89
482027TP-96A	200	\$2,245	\$1,827	\$3,264	\$133.30	\$7,470	\$3,735	\$36.12
105192TP-905	300	\$4,530	\$5,268	\$4,139	\$133.30	\$14,071	\$7,035	\$83.77
185015TP-7A4	200	\$1,796	\$701	\$3,426	\$133.30	\$6,056	\$3,028	\$74.24
543645TP-165	75	\$2,040	\$2,649	\$1,845	\$133.30	\$6,668	(\$1,683)	\$93.47
5678995TP-502	200	\$4,830	\$2,994	\$2,665	\$133.30	\$10,622	\$5,311	\$25.07
800133TP-562	4,500	\$4,457	\$6,005	\$1,859	\$133.30	\$12,454	\$6,227	\$17.36
3193295TP-E03	200	\$1,288	\$4,839	\$4,199	\$133.30	\$10,459	\$5,230	\$76.31
141326TP-DAF	200	\$5,943	\$12,578	\$3,606	\$133.30	\$22,260	\$11,130	\$27.59
141327TP-1EA	300	\$11,821	\$19,239	\$4,424	\$133.30	\$35,618	\$17,809	\$35.62
800163TP-D6A	300	\$4,393	\$7,651	\$4,431	\$133.30	\$16,609	\$8,305	\$62.34
444030TP-F7D	200	\$2,620	\$7,222	\$3,260	\$133.30	\$13,235	\$6,618	\$27.72
448899TP-2BE	100	\$1,445	\$1.484	\$1,909	\$133.30	\$4.971	\$3.714	\$93.47

2023

427512TP-710	150	\$182	\$1,302	\$3,116	\$133.30	\$4,734	\$2,367	\$78.57
549615TP-72D	300	\$5,703	\$7,382	\$3,473	\$133.30	\$16,690	\$8,345	\$18.20
333049TP-FA3	150	\$1,812	\$11,262	\$3,546	\$133.30	\$16,754	\$16,754	\$0.00
3330513TP-914	150	\$1,888	\$10,107	\$3,654	\$133.30	\$15,782	\$15,782	\$0.00
240526TP-6BD	150	\$4,684	\$2,555	\$5,341	\$133.30	\$12,713	(\$3,826)	\$93.47
8001505TP-013	300	\$4,847	\$2,704	\$7,606	\$133.30	\$15,291	(\$1,615)	\$93.47
1421599TP-FF7	200	\$2,658	\$1,330	\$5,039	\$133.30	\$9,160	\$4,580	\$27.69
8001801TP-411	1,000	\$46,217	\$29,823	\$9,481	\$133.30	\$85,654	\$51,393	\$26.03
8001815TP-FB6	1,000	\$51,422	\$57,652	\$9,481	\$133.30	\$118,688	\$59,344	\$38.81
800181TP-755	200	\$6,046	\$4,381	\$3,513	\$133.30	\$14,073	\$7,036	\$48.00
612680TP-5A5	100	\$1,384	\$3,247	\$3,944	\$133.30	\$8,709	\$4,354	\$37.33
175065TP-765	75	\$706	\$1,674	\$2,308	\$133.30	\$4,822	\$2,411	\$41.44
4004001TP-401	150	\$1,824	\$3,632	\$2,792	\$133.30	\$8,381	\$2,872	\$93.47
5290993TP-D4F	150	\$2,218	\$1,570	\$2,493	\$133.30	\$6,414	(\$1,992)	\$93.47
166730TP-721	150	\$302	\$640	\$2,134	\$133.30	\$3,209	\$1,605	\$110.37
632751TP-46B	150	\$1,887	\$1,602	\$2,892	\$133.30	\$6,515	(\$1,012)	\$93.47
318907TP-1B9	100	\$894	\$1,826	\$2,953	\$133.30	\$5,807	\$5,807	\$0.00
3193735TP-319	200	\$4,758	\$19,422	\$3,647	\$133.30	\$27,960	\$27,960	\$0.00
319398TP-A2A	75	\$1,558	\$1,323	\$2,000	\$133.30	\$5,014	\$5,014	\$0.00
3336978TP-1FC	100	\$276	\$2,447	\$3,880	\$133.30	\$6,737	\$6,737	\$0.00
141806TP-3F4	150	\$789	\$1,438	\$3,055	\$133.30	\$5,414	\$5,414	\$0.00
313732TP-2E5	200	\$6,413	\$15,201	\$3,354	\$133.30	\$25,102	(\$2,178)	\$93.47
249946TP-9E1	150	\$2,353	\$3,497	\$2,889	\$133.30	\$8,872	\$4,436	\$25.66
249967TP-8F1	100	\$512	\$507	\$2,778	\$133.30	\$3,930	\$3,930	\$0.00
249945TP-521	150	\$2,219	\$4,231	\$2,999	\$133.30	\$9,582	\$4,791	\$26.33
362484TP-9C2	200	\$7,242	\$10,598	\$1,904	\$133.30	\$19,877	\$9,939	\$25.20
405350TP-9BB	150	\$2.417	\$12.270	\$2.705	\$133.30	\$17.525	(\$5.846)	\$93.47

2023

405508TP-5A1	200	\$3,092	\$16,013	\$3,270	\$133.30	\$22,508	(\$9,809)	\$93.47
209549TP-1A6	100	\$1,485	\$2,459	\$3,332	\$133.30	\$7,408	\$3,704	\$70.58
800153TP-A92	500	\$14,405	\$6,967	\$8,754	\$133.30	\$30,260	\$15,130	\$24.53
116195TP-ECE	150	\$5,398	\$2,512	\$4,338	\$133.30	\$12,381	(\$5,644)	\$93.47
172559TP-2E6	150	\$1,274	\$3,599	\$4,687	\$133.30	\$9,693	\$6,929	\$93.47
162713TP-034	150	\$5,092	\$7,581	\$7,224	\$133.30	\$20,030	\$7,872	\$93.47
5791985TP-A1E	150	\$4,768	\$3,650	\$2,742	\$133.30	\$11,292	\$3,183	\$93.47
690202TP-00E	50	\$4,649	\$8,878	\$771	\$133.30	\$14,432	\$7,216	\$33.02
6902235TP-F5B	50	\$1,791	\$143	\$1,105	\$133.30	\$3,172	\$1,586	\$582.16
690247TP-FE4	50	\$3,655	\$6,059	\$1,836	\$133.30	\$11,684	\$5,842	\$25.41
690237TP-AB9	50	\$10,162	\$21,367	\$1,799	\$133.30	\$33,461	\$16,731	\$24.43
690250TP-883	500	\$3,493	\$1,078	\$10,189	\$133.30	\$14,893	\$7,446	\$99.39
318943TP-216	200	\$220	\$5,734	\$3,514	\$133.30	\$9,601	\$4,801	\$62.85
243366TP-0FE	200	\$716	\$735	\$5,266	\$133.30	\$6,850	\$3,425	\$53.40
141848TP-2CA	100	\$1,040	\$589	\$3,349	\$133.30	\$5,111	\$2,555	\$25.04
3312316TP-8D0	200	\$2,190	\$21,803	\$4,686	\$133.30	\$28,811	\$18,863	\$93.47
166724TP-C86	500	\$29,669	\$11,232	\$4,244	\$133.30	\$45,278	\$27,167	\$13.06
166727TP-046	200	\$685	\$329	\$2,799	\$133.30	\$3,946	\$1,973	\$42.97
241126TP-B1C	150	\$2,983	\$982	\$4,195	\$133.30	\$8,294	\$4,147	\$45.96
690224TP-CD4	150	\$1,620	\$563	\$2,495	\$133.30	\$4,811	\$2,406	\$34.23
6902265TP-753	100	\$1,260	\$2,485	\$2,310	\$133.30	\$6,188	\$3,094	\$33.15
690249TP-C7F	200	\$940	\$181	\$2,831	\$133.30	\$4,086	\$2,043	\$56.68
250351TP-0CD	300	\$8,898	\$3,498	\$5,465	\$133.30	\$17,995	\$8,997	\$27.23
177096TP-8F2	200	\$8,885	\$2,905	\$3,626	\$133.30	\$15,550	\$9,330	\$23.20
800151TP-A17	100	\$4,963	\$10,735	\$2,640	\$133.30	\$18,471	(\$3,008)	\$93.47
240375TP-473	150	\$5,018	\$1,027	\$3,275	\$133.30	\$9,453	(\$4,170)	\$93.47
381326TP-1C7	200	\$2,346	\$31,062	\$5,360	\$133.30	\$38,901	\$38,901	\$0.00

2023

381331TP-6A0	200	\$2,346	\$31,062	\$6,477	\$133.30	\$40,018	\$40,018	\$0.00
517704TP-375	150	\$4,557	\$2,827	\$2,809	\$133.30	\$10,327	\$5,458	\$93.47
637250TP-A0B	750	\$2,417	\$8,636	\$6,910	\$133.30	\$18,096	\$9,048	\$23.53
3193724TP-5F1	300	\$3,950	\$11,892	\$4,548	\$133.30	\$20,523	\$20,523	\$0.00
162358TP-044	150	\$415	\$527	\$3,366	\$133.30	\$4,441	\$2,221	\$34.82
141929TP-87B	200	\$4,005	\$5,278	\$3,900	\$133.30	\$13,317	\$477	\$93.47
6222490TP-205	500	\$1,723	\$2,880	\$7,203	\$133.30	\$11,939	\$5,970	\$16.13
482074TP-DA2	200	\$2,886	\$3,466	\$3,633	\$133.30	\$10,118	\$5,059	\$41.39
HWRH	1,500	\$18,442	\$3,035	\$9,144	\$133.30	\$30,754	\$21,528	\$60.70
8001245TP-DB4	500	\$10,871	\$24,958	\$5,556	\$133.30	\$41,519	\$20,759	\$36.76
8001236TP-429	150	\$2,037	\$554	\$3,283	\$133.30	\$6,007	\$3,004	\$52.85
8001876TP-C86	300	\$6,814	\$3,819	\$4,761	\$133.30	\$15,527	(\$1,801)	\$93.47
8001235TP-8E9	200	\$6,099	\$3,197	\$3,831	\$133.30	\$13,260	\$9,395	\$93.47
625837TP-99A	500	\$2,848	\$4,253	\$3,995	\$133.30	\$11,228	\$5,614	\$33.95
555205TP-2E0	100	\$925	\$1,436	\$2,626	\$133.30	\$5,121	\$2,561	\$30.92
556467TP-973	1,000	\$13,450	\$12,423	\$5,404	\$133.30	\$31,410	\$15,705	\$13.35
569640TP-BA7	300	\$1,482	\$2,478	\$3,734	\$133.30	\$7,827	\$3,914	\$52.26
800103TP-29A	300	\$5,328	\$5,076	\$3,157	\$133.30	\$13,694	\$6,847	\$17.68
800114TP-5FD	750	\$17,035	\$26,254	\$5,773	\$133.30	\$49,195	\$24,598	\$17.41
521000TP-991	50	\$1,017	\$1,990	\$824	\$133.30	\$3,965	\$1,983	\$24.42
5210031TP-3F9	100	\$2,765	\$4,652	\$2,052	\$133.30	\$9,601	\$4,801	\$26.57
564570TP-57C	50	\$680	\$514	\$783	\$133.30	\$2,110	\$1,055	\$129.60
5791875TP-30D	200	\$5,485	\$3,294	\$2,897	\$133.30	\$11,810	\$5,905	\$22.76
5791016TP-030	50	\$1,420	\$2,428	\$694	\$133.30	\$4,676	\$2,338	\$25.01
800130TP-9A2	300	\$18,891	\$7,715	\$3,115	\$133.30	\$29,855	\$17,913	\$10.05
181975TP-7DD	150	\$7,248	\$2,265	\$3,496	\$133.30	\$13,142	\$6,571	\$19.47
4182832TP-1BD	200	\$7.237	\$34.230	\$3.677	\$133.30	\$45.277	\$11.378	\$93.47

2023

4182836TP-0B7	150	\$1,017	\$4,491	\$3,397	\$133.30	\$9,038	\$1,340	\$93.47
418284TP-E36	500	\$15,453	\$34,803	\$6,437	\$133.30	\$56,826	\$28,413	\$108.50
176257TP-8FF	200	\$2,929	\$543	\$2,590	\$133.30	\$6,195	\$3,097	\$56.72
800164TP-0A0	300	\$9,837	\$36,816	\$4,420	\$133.30	\$51,207	\$25,603	\$60.61
319736TP-DAF	200	\$233	\$4,071	\$4,881	\$133.30	\$9,317	\$9,317	\$0.00
180710TP-2C9	150	\$2,522	\$643	\$2,687	\$133.30	\$5,985	\$475	\$93.47
8001695TP-CF7	750	\$23,345	\$21,122	\$4,256	\$133.30	\$48,857	\$24,428	\$13.15
208362TP-581	150	\$1,885	\$3,529	\$3,079	\$133.30	\$8,626	\$4,079	\$93.47
800147TP-135	150	\$6,650	\$3,170	\$2,405	\$133.30	\$12,358	\$6,179	\$19.45
800150TP-652	100	\$1,086	\$477	\$2,686	\$133.30	\$4,383	\$3,481	\$93.47
142817TP-7FC	150	\$1,022	\$573	\$2,916	\$133.30	\$4,644	\$1,815	\$93.47
181750TP-1CC	200	\$6,247	\$1,807	\$3,548	\$133.30	\$11,735	\$5,868	\$16.28
6204314TP-54A	100	\$3,327	\$4,848	\$2,596	\$133.30	\$10,904	(\$3,339)	\$93.47
589190TP-49A	150	\$2,065	\$3,955	\$2,803	\$133.30	\$8,957	\$4,479	\$32.01
116167TP-E5C	150	\$1,691	\$470	\$2,572	\$133.30	\$4,866	\$2,433	\$48.06
118468TP-C47	100	\$2,957	\$5,345	\$2,174	\$133.30	\$10,610	(\$6,773)	\$93.47
1015827TP-5C5	150	\$2,654	\$3,369	\$3,490	\$133.30	\$9,647	\$1,587	\$93.47
190101TP-AC6	150	\$1,763	\$465	\$3,760	\$133.30	\$6,121	(\$1,044)	\$93.47
800169TP-FFB	150	\$2,712	\$1,800	\$2,557	\$133.30	\$7,203	\$3,602	\$20.14
400440TP-B34	100	\$1,409	\$2,639	\$1,982	\$133.30	\$6,163	(\$1,103)	\$93.47
364828TP-B0F	150	\$211	\$533	\$3,407	\$133.30	\$4,284	\$2,142	\$57.64
192544TP-A6D	300	\$22,864	\$9,153	\$5,283	\$133.30	\$37,434	\$22,460	\$14.20
426599TP-D2E	500	\$10,476	\$13,625	\$6,044	\$133.30	\$30,279	\$15,139	\$20.32
192519TP-D3E	150	\$5,058	\$1,669	\$3,670	\$133.30	\$10,530	\$1,233	\$93.47
1186118TP-5A2	200	\$4,494	\$4,068	\$2,692	\$133.30	\$11,387	\$5,693	\$28.17
1186119TP-9E7	300	\$10,710	\$9,914	\$3,053	\$133.30	\$23,810	\$11,905	\$41.23
118615TP-C46	200	\$8 575	\$5 651	\$2 692	\$133 30	\$17 052	(\$9,816)	\$93 47

2023

6204404TP-0E5	1,000	\$33,782	\$29,718	\$5,101	\$133.30	\$68,733	\$34,367	\$21.18
6204405TP-CA0	300	\$8,979	\$6,146	\$2,970	\$133.30	\$18,228	\$9,114	\$23.96
6204407TP-C25	750	\$41,408	\$19,605	\$4,553	\$133.30	\$65,699	\$39,419	\$25.27
6204409TP-FBE	750	\$42,158	\$26,311	\$4,553	\$133.30	\$73,156	\$43,894	\$14.71
6204408TP-3FB	750	\$34,397	\$26,514	\$4,553	\$133.30	\$65,598	\$32,799	\$16.77
620456TP-103	750	\$14,785	\$11,135	\$4,556	\$133.30	\$30,609	\$15,305	\$23.41
8001320TP-60F	300	\$2,862	\$2,310	\$2,970	\$133.30	\$8,274	\$4,137	\$26.85
620455TP-DC3	300	\$8,167	\$3,956	\$3,041	\$133.30	\$15,298	\$7,649	\$32.10
6204406TP-060	1,500	\$27,797	\$14,496	\$14,812	\$133.30	\$57,238	\$28,619	\$34.14
62044065TP-1CD	1,000	\$30,723	\$18,646	\$5,412	\$133.30	\$54,914	\$32,948	\$17.01
176630TP-6C4	150	\$4,490	\$1,746	\$2,684	\$133.30	\$9,054	\$4,527	\$20.47
186250TP-0A9	750	\$10,180	\$3,064	\$6,421	\$133.30	\$19,797	\$9,899	\$21.41
204735TP-7C2	100	\$1,057	\$5,169	\$4,611	\$133.30	\$10,970	\$5,485	\$54.92
657599TP-EEF	200	\$4,725	\$2,567	\$360	\$133.30	\$7,786	\$7,786	\$0.00
525441TP-DF0	150	\$1,013	\$193	\$2,633	\$133.30	\$3,973	\$1,660	\$93.47
633604TP-988	200	\$3,128	\$4,605	\$2,889	\$133.30	\$10,755	\$5,377	\$29.84
5552249TP-369	200	\$4,689	\$1,149	\$3,565	\$133.30	\$9,536	\$4,768	\$65.32
1164012TP-00A	500	\$13,096	\$7,277	\$3,935	\$133.30	\$24,441	\$12,220	\$19.03
530906TP-856	300	\$5,695	\$9,978	\$2,978	\$133.30	\$18,784	\$9,392	\$28.89
5672985TP-1EF	100	\$1,254	\$1,453	\$1,702	\$133.30	\$4,542	\$760	\$93.47
615269TP-92F	300	\$8,648	\$12,123	\$4,402	\$133.30	\$25,307	\$12,654	\$46.36
543979TP-A8C	50	\$385	\$1,664	\$0	\$133.30	\$2,183	\$1,091	\$40.90
1819727TP-A3B	100	\$937	\$2,741	\$2,065	\$133.30	\$5,877	\$2,938	\$29.53
50150092TP-CF2	75	\$2,243	\$2,199	\$1,746	\$133.30	\$6,320	\$3,160	\$48.11
50150100TP-A94	150	\$4,394	\$1,170	\$2,557	\$133.30	\$8,254	\$4,127	\$22.05
800152TP-6D7	1,250	\$57,183	\$23,581	\$2,064	\$133.30	\$82,961	\$49,777	\$10.55
800170TP-B07	750	\$513	\$1,449	\$4.748	\$133.30	\$6.844	\$3.422	\$729.96
2023

182010TP-E8B	100	\$5,015	\$7,118	\$2,713	\$133.30	\$14,980	\$7,490	\$37.45
332490TP-111	200	\$2,830	\$13,462	\$4,322	\$133.30	\$20,747	\$10,373	\$161.27
8001045TP-7B3	500	\$10,142	\$11,151	\$4,234	\$133.30	\$25,660	\$12,830	\$24.61
800104TP-F50	1,000	\$36,727	\$33,392	\$5,862	\$133.30	\$76,114	\$38,057	\$15.64
5791226TP-DCF	300	\$12,778	\$10,797	\$3,359	\$133.30	\$27,068	\$13,534	\$17.91
6438465TP-89B	500	\$9,813	\$18,509	\$4,485	\$133.30	\$32,941	\$16,470	\$26.94
643847TP-B5F	500	\$4,406	\$5,687	\$4,485	\$133.30	\$14,711	\$7,356	\$37.13
6438485TP-221	200	\$1,898	\$2,615	\$2,896	\$133.30	\$7,543	(\$4,349)	\$93.47
800132TP-927	100	\$2,803	\$4,319	\$3,434	\$133.30	\$10,689	\$5,344	\$28.24
3149145TP-253	300	\$7,411	\$47,918	\$5,253	\$133.30	\$60,715	\$30,358	\$127.23
8001312TP-172	200	\$6,697	\$5,367	\$2,659	\$133.30	\$14,857	\$7,428	\$24.89
800113TP-837	100	\$1,257	\$2,460	\$1,926	\$133.30	\$5,775	(\$4,090)	\$93.47
331280TP-F5A	200	\$913	\$27,307	\$4,608	\$133.30	\$32,962	\$32,962	\$0.00
579184TP-AA1	100	\$2,560	\$4,007	\$1,442	\$133.30	\$8,142	\$4,071	\$38.08
568266TP-ADC	500	\$16,354	\$14,870	\$4,212	\$133.30	\$35,570	\$17,785	\$18.94
5682737TP-04F	300	\$1,635	\$2,358	\$3,195	\$133.30	\$7,322	\$3,661	\$41.10
5684239TP-311	150	\$3,130	\$1,666	\$2,163	\$133.30	\$7,093	\$3,546	\$30.48
396517TP-0FD	50	\$310	\$465	\$2,026	\$133.30	\$2,935	\$1,438	\$93.47
482070TP-CA8	300	\$6,108	\$7,490	\$4,464	\$133.30	\$18,196	(\$1,999)	\$93.47
308479TP-A96	200	\$2,392	\$3,457	\$10,700	\$133.30	\$16,682	\$10,851	\$93.47
300360TP-C68	75	\$386	\$139	\$812	\$133.30	\$1,471	\$1,277	\$93.47
208740TP-450	300	\$5,103	\$19,760	\$3,920	\$133.30	\$28,916	\$14,458	\$36.89
569639TP-0AB	150	\$3,763	\$3,468	\$2,509	\$133.30	\$9,873	\$4,936	\$33.06
319705TP-697	150	\$352	\$6,872	\$3,639	\$133.30	\$10,997	\$10,997	\$0.00
617670TP-292	50	\$1,163	\$1,005	\$2,040	\$133.30	\$4,341	\$2,170	\$75.38
112267TP-BDF	150	\$1,411	\$881	\$2,755	\$133.30	\$5,181	\$575	\$93.47
141924TP-720	200	\$269	\$287	\$3,789	\$133.30	\$4,479	\$2,239	\$50.07

2023

192534TP-F30	150	\$2,141	\$489	\$3,121	\$133.30	\$5,884	\$2,942	\$35.12
142192TP-6F0	150	\$2,831	\$777	\$17,039	\$133.30	\$20,780	\$10,390	\$520.78
800171TP-742	1,500	\$12,947	\$44,373	\$783	\$133.30	\$58,237	\$29,118	\$83.75
1101999TP-7E5	750	\$9,024	\$11,142	\$10,305	\$133.30	\$30,604	\$15,302	\$34.43
632798TP-DD5	100	\$2,348	\$4,966	\$2,665	\$133.30	\$10,111	\$5,056	\$49.71
634528TP-0A0	30	\$686	\$853	\$1,809	\$133.30	\$3,481	\$1,740	\$43.92
5552049TP-96E	300	\$6,935	\$18,885	\$4,169	\$133.30	\$30,123	\$15,061	\$14.60
5552055TP-0DD	3,500	\$81,429	\$185,108	\$16,542	\$133.30	\$283,212	\$283,212	\$0.00
623482TP-FAB	150	\$6,986	\$4,670	\$3,519	\$133.30	\$15,309	(\$19,273)	\$93.47
800121TP-F4A	2,000	\$69,261	\$34,777	\$8,350	\$133.30	\$112,521	\$67,513	\$11.42
184621TP-6F0	50	\$1,574	\$1,452	\$711	\$133.30	\$3,871	\$991	\$93.47
800125TP-E40	2,000	\$73,277	\$110,602	\$376	\$133.30	\$184,388	\$92,194	\$23.94
1101005TP-215	500	\$175	\$730	\$6,626	\$133.30	\$7,664	\$7,664	\$0.00
8001011TP-EB1	50	\$1,423	\$2,434	\$1,816	\$133.30	\$5,806	\$2,903	\$46.82
400495TP-B39	200	\$3,431	\$16,201	\$4,114	\$133.30	\$23,879	\$11,940	\$48.74
800112TP-472	100	\$910	\$3,606	\$2,795	\$133.30	\$7,445	\$3,722	\$30.19
434220TP-56E	50	\$1,115	\$1,741	\$1,784	\$133.30	\$4,774	\$2,387	\$30.25
416103TP-D75	50	\$1,124	\$1,986	\$2,122	\$133.30	\$5,365	\$2,683	\$30.43
530380TP-699	50	\$1,633	\$3,710	\$486	\$133.30	\$5,962	\$2,981	\$18.47
410812TP-754	50	\$1,390	\$2,185	\$978	\$133.30	\$4,687	\$2,343	\$24.78
615606TP-500	50	\$145	\$217	\$1,556	\$133.30	\$2,051	\$1,026	\$512.85
405709TP-3E3	500	\$9,603	\$22,653	\$7,386	\$133.30	\$39,775	\$19,888	\$68.81
388525TP-7A1	200	\$2,081	\$2,974	\$12,650	\$133.30	\$17,839	\$8,920	\$151.53
5791154TP-B14	150	\$6,837	\$3,709	\$2,330	\$133.30	\$13,010	\$6,505	\$28.91
656382TP-D30	100	\$81	\$410	\$2,627	\$133.30	\$3,252	\$3,073	\$93.47
800131TP-5E7	300	\$4,041	\$5,736	\$2,851	\$133.30	\$12,761	\$6,381	\$21.69
520373TP-2AF	1,500	\$19.536	\$42.390	\$7.058	\$133.30	\$69.116	\$34,558	\$37.47

2023

184687TP-F60	150	\$4,573	\$1,741	\$2,648	\$133.30	\$9,095	(\$3,410)	\$93.47
522002TP-BF4	300	\$8,619	\$4,751	\$3,545	\$133.30	\$17,049	\$8,524	\$19.57
521503TP-054	200	\$6,054	\$1,805	\$3,020	\$133.30	\$11,013	\$5,506	\$42.36
150925TP-224	150	\$8,455	\$19,292	\$2,999	\$133.30	\$30,879	\$15,439	\$34.08
150931TP-983	500	\$13,165	\$32,978	\$5,111	\$133.30	\$51,387	\$25,693	\$61.58
3764605TP-D7E	300	\$5,964	\$19,782	\$4,558	\$133.30	\$30,436	\$15,218	\$65.99
406890TP-FBA	75	\$464	\$4,304	\$1,263	\$133.30	\$6,165	\$3,082	\$24.14
405386TP-576	150	\$266	\$5,466	\$3,152	\$133.30	\$9,018	\$4,509	\$153.10
405190TP-453	150	\$2,545	\$9,365	\$2,990	\$133.30	\$15,034	\$2,335	\$93.47
389990TP-5F0	150	\$2,197	\$11,868	\$3,051	\$133.30	\$17,249	\$4,605	\$93.47
389997TP-83A	200	\$1,136	\$3,688	\$3,266	\$133.30	\$8,224	\$1,807	\$93.47
389999TP-BA1	300	\$1,621	\$2,424	\$4,436	\$133.30	\$8,614	\$4,307	\$109.77
401815TP-3DF	300	\$8,566	\$33,330	\$4,867	\$133.30	\$46,897	\$23,448	\$39.53
800161TP-DEF	500	\$1,779	\$2,150	\$5,903	\$133.30	\$9,966	\$4,983	\$95.88
181911TP-927	75	\$3,645	\$3,790	\$1,496	\$133.30	\$9,065	\$4,532	\$29.76
235545TP-814	200	\$7,887	\$3,312	\$4,193	\$133.30	\$15,525	\$7,763	\$21.11
6375055TP-7DC	500	\$5,507	\$19,202	\$5,649	\$133.30	\$30,491	\$15,245	\$15.96
3204065TP-B03	150	\$1,039	\$4,062	\$2,826	\$133.30	\$9,260	\$4,630	\$93.81
624649TP-8F7	500	\$1,906	\$4,004	\$4,915	\$133.30	\$10,959	\$5,480	\$16.46
800166TP-025	200	\$2,891	\$4,240	\$3,363	\$133.30	\$10,627	\$5,314	\$64.91
416731TP-C0E	150	\$2,368	\$7,004	\$3,397	\$133.30	\$12,902	\$7,239	\$93.47
549325TP-5D0	500	\$3,137	\$5,006	\$4,494	\$133.30	\$12,771	\$6,385	\$16.43
624606TP-58C	150	\$3,180	\$2,254	\$2,731	\$133.30	\$8,299	\$1,228	\$93.47
141845TP-D91	200	\$2,411	\$6,829	\$4,046	\$133.30	\$13,831	\$741	\$93.47
333060TP-CA7	150	\$1,820	\$11,257	\$3,747	\$133.30	\$16,957	\$16,957	\$0.00
3330508TP-D6D	300	\$1,453	\$12,008	\$4,690	\$133.30	\$18,284	\$18,284	\$0.00
405769TP-C13	200	\$3,251	\$13,526	\$9,094	\$133.30	\$26,005	\$6,963	\$93.47

2023

373002TP-847	200	\$4,342	\$5,623	\$3,037	\$133.30	\$13,135	\$6,568	\$174.02
141990TP-498	150	\$3,289	\$4,241	\$4,561	\$133.30	\$12,225	\$8,219	\$93.47
1419725TP-870	200	\$2,828	\$3,370	\$4,150	\$133.30	\$10,481	\$5,047	\$93.47
4245295TP-206	150	\$717	\$2,140	\$3,305	\$133.30	\$6,296	\$3,148	\$38.34
424510TP-575	500	\$9,609	\$11,077	\$6,415	\$133.30	\$27,235	\$13,617	\$38.98
3193075TP-EBE	200	\$3,259	\$13,434	\$3,689	\$133.30	\$20,515	\$20,515	\$0.00
338411TP-65E	300	\$3,191	\$15,237	\$3,514	\$133.30	\$22,076	\$11,038	\$67.00
613920TP-315	100	\$561	\$839	\$3,546	\$133.30	\$5,080	\$2,540	\$79.84
8001015TP-FBB	300	\$13,433	\$9,863	\$3,310	\$133.30	\$26,738	\$13,369	\$15.77
800149TP-2AE	300	\$18,446	\$6,930	\$5,462	\$133.30	\$30,971	\$18,583	\$21.85



2023

Line Pricing Methodology

#### Line Charge Breakdown for Group Customers

Consumer	Code	Number of	Transpower	Subtransmission	Distribution	TPCL	Fixed
Capacity		Connections	Charge	Charge	Charge	Overhead	Charge
							per Day
TPCL Urban							
Residential Standard							
Small Residential (8kVA 1 Phase) - All Peak	UD08P	104	\$5 688	\$15 449	\$14 689	\$13,907	\$1 0481
Small Residential (8kVA 1 Phase) - With Off Peak	UD08Q	203	\$9 595	\$25.621	\$24 298	\$27.037	\$0.6857
Residential (15kVA 1 Phase) - All Peak	UD20P	2 182	\$297.455	\$807.852	\$768 122	\$200 807	\$1 8851
Residential (15kVA 1 Phase) - With Off Peak	UD20Q	7.407	\$875,807	\$2 338 876	\$2 218 112	\$087.261	\$1.3151
Residential Low Fixed Charge Option (15kVA 1 Phase) - All Peak	UDL20P	1,407	\$206 442	\$2,338,870	¢527 107	¢219.406	¢0.4500
Residential Low Fixed Charge Option (15kVA 1 Phase) - With Off	UDL20Q	1,639	φ200,442	\$520,079	φ <u></u> σ <i>21</i> ,107	<b>\$210,400</b>	<b>Φ</b> 0.4500
Peak Pacidential Low Eived Charge Option (%)(A.1 Phase) All Peak		5,259	\$570,519	\$1,422,329	\$1,438,978	\$701,006	\$0.3000
Residential Low Fixed Charge Option (orver 1 Filase) - All Fear	UDLUOF	68	\$3,620	\$9,396	\$9,189	\$9,086	\$0.4500
Residential Low Fixed Charge Option (8kVA 1 Phase) - With Off Peak	UDL08Q	138	\$6,401	\$16,813	\$16,195	\$18,439	\$0.3000
General Single Phase							
Street Lights (1 Phase)	US001L	5,381	\$75,497	\$188,086	\$105,609	\$14,345	\$0.1524
1 kVA 1 Phase - All Peak	US001P	30	\$2.115	\$6.492	\$3.402	\$3,999	\$0.7427
8 kVA 1 Phase - All Peak	US008P	244	\$13 294	\$36 105	\$34 329	\$32 502	\$1 0479
8 kVA 1 Phase - With Off Peak	US008Q	14	\$662	\$1 768	\$1 677	\$1,866	\$0.6855
15 kVA 1 Phase - All Peak	US020P	377	\$51.317	\$139 372	\$132 518	\$50,186	\$1 8851
15 kVA 1 Phase - With Off Peak	US020Q	95	¢11 235	\$30,000	\$28.451	\$12 662	\$1.3151
		30	ψ11,200	ψ30,000	Ψ20,401	ψ12,000	ψ1.5151



2023

Line Pricing Methodology

General Three Phase							
15 kVA 3 Phase - All Peak	UT015P	108	\$10,831	\$28,995	\$27,907	\$14,352	\$1.8549
15 kVA 3 Phase - With Off Peak	UT015Q	12	\$1,060	\$2,794	\$2,683	\$1,622	\$1.2611
30 kVA 3 Phase - All Peak	UT030P	548	\$127,898	\$330,582	\$324,202	\$73,091	\$2.9637
30 kVA 3 Phase - With Off Peak	UT030Q	92	\$18,490	\$47,194	\$46,188	\$12,241	\$1.9831
50 kVA 3 Phase - All Peak	UT050P	324	\$195,551	\$573,626	\$500,618	\$43,233	\$5.9903
50 kVA 3 Phase - With Off Peak	UT050Q	79	\$41,588	\$119,073	\$103,580	\$10,508	\$4.0785
75 kVA 3 Phase - All Peak	UT075P	99	\$106,584	\$289,470	\$266,354	\$13,130	\$7.8755
75 kVA 3 Phase - With Off Peak	UT075Q	17	\$15,648	\$41,783	\$38,348	\$2,222	\$5.3080
100 kVA 3 Phase - All Peak	UT100P	26	\$49,655	\$142,421	\$124,796	\$3,466	\$11.5800
100 kVA 3 Phase - With Off Peak	UT100Q	3	\$5,000	\$14,030	\$12,256	\$400	\$8.0429

### **TPCL Rural**

#### Residential

Small Residential (8kVA 1 Phase) - All Peak	RD08P	121	\$6,570	\$17,843	\$51,092	\$16,062	\$1.1810
Small Residential (8kVA 1 Phase) - With Off Peak	RD08Q	96	\$4,525	\$12,084	\$34,828	\$12,752	\$0.8000
Residential (15kVA 1 Phase) - All Peak	RD20P	2,386	\$325,170	\$883,121	\$2,528,808	\$318,001	\$2.1707
Residential (15kVA 1 Phase) - With Off Peak	RD20Q	5,469	\$646,708	\$1,726,881	\$4,977,121	\$728,932	\$1.4855
Residential Low Fixed Charge Option (15kVA 1 Phase) - All Peak	RDL20P	846	\$106,560	\$268,451	\$785,972	\$112,736	\$0.4500
Residential Low Fixed Charge Option (15kVA 1 Phase) - With Off Peak	RDL20Q	1,969	\$213,569	\$532,438	\$1,565,493	\$262,416	\$0.3000
Residential Low Fixed Charge Option (8kVA 1 Phase) - All Peak	RDL08P	39	\$2,080	\$5,399	\$15,681	\$5,221	\$0.4500
Residential Low Fixed Charge Option (8kVA 1 Phase) - With Off Peak	RDL08Q	25	\$1,165	\$3,059	\$8,858	\$3,355	\$0.3000



General Single Phase							
Street Lights (1 Phase)	RS001L	1,161	\$16,289	\$40,581	\$81,357	\$3,095	\$0.1715
1 kVA 1 Phase - All Peak	RS001P	139	\$9,790	\$30,042	\$61,189	\$18,506	\$0.7427
8 kVA 1 Phase - All Peak	RS008P	1.132	\$61.717	\$167.617	\$479.968	\$150.892	\$1,1810
8 kVA 1 Phase - With Off Peak	RS008Q	26	\$1.230	\$3.284	\$9.465	\$3.466	\$0.8000
15 kVA 1 Phase - All Peak	RS020P	1.649	\$224,693	\$610.238	\$1,747,411	\$219.739	\$2,1707
15 kVA 1 Phase - With Off Peak	RS020Q	348	\$41.096	\$109.736	\$316.275	\$46.321	\$1,4855
	I						
General Three Phase							
15 kVA 3 Phase - All Peak	RT015P	351	\$35,310	\$94,525	\$271,803	\$46,787	\$2.1267
15 kVA 3 Phase - With Off Peak	RT015Q	19	\$1,656	\$4,364	\$12,625	\$2,533	\$1.4453
30 kVA 3 Phase - All Peak	RT030P	1,823	\$425,212	\$1,099,060	\$3,161,096	\$243,000	\$3.3900
30 kVA 3 Phase - With Off Peak	RT030Q	411	\$82,686	\$211,046	\$610,103	\$54,740	\$2.3028
50 kVA 3 Phase - All Peak	RT050P	658	\$396,729	\$1,163,760	\$3,203,547	\$87,709	\$6.8537
50 kVA 3 Phase - With Off Peak	RT050Q	510	\$268,870	\$769,824	\$2,138,328	\$67,937	\$4.6945
75 kVA 3 Phase - All Peak	RT075P	100	\$108,027	\$293,388	\$816,015	\$13,307	\$9.4540
75 kVA 3 Phase - With Off Peak	RT075Q	39	\$36,459	\$97,354	\$272,621	\$5,176	\$6.3670
100 kVA 3 Phase - All Peak	RT100P	30	\$57,613	\$165,245	\$451,824	\$4,021	\$13.9178
100 kVA 3 Phase - With Off Peak	RT100Q	9	\$15.001	\$42.090	\$116.066	\$1.200	\$9.6517

Variable Line Charge Prices	Peak c/kWh		Shoulder c/kWh		Night c/kWh
Residential Standard and General	\$	0.09347	\$	0.08345	\$ 0.02000
Residential Low Fixed Charge Fixed Charge Option (8kVA 1 Phase)	\$	0.11454	\$	0.09345	\$ 0.02000
Residential Low Fixed Charge Fixed Charge Option (20kVA 1 Phase)	\$	0.14247	\$	0.12633	\$ 0.02000