

Group 3: Pricing from 1 April 2018 and load management

This document is intended to provide background to Network Tasman’s Group 3 pricing, in particular the Regional Coincident Peak Demand (RCPD) price, so that customers may manage their load patterns to help minimise charges. The RCPD price is the main Group 3 pricing component used to recover transmission costs that are levied on Network Tasman by Transpower.

Group 3 pricing applies to connections with capacity greater than 150kVA. Group 3 accounts for around 150 of Network Tasman’s largest connections. The majority of Group 3 connections are in price category 3.4, with some specific types of connections being eligible for price categories 3.1, 3.3 or 3.5.

1 Background to Transpower’s Transmission Pricing

Transpower’s pricing methodology (TPM) became effective from 1 April 2008 and is sanctioned by the Electricity Authority. This methodology defines the core transmission grid and connection assets, and applies Interconnection Charges on a Regional Coincident Peak Demand (RCPD) basis for the Upper South Island (USI) region. The USI region includes all Grid substations and HVAC lines from Timaru north and includes Network Tasman’s entire supply area.



2 Transmission charge components – how Transpower charges Network Tasman

Connection charge

Transpower’s Connection Charge recovers the annual cost of connection assets, typically at substations or HVAC lines dedicated to the supply of companies such as Network Tasman. These charges are allocated to all grid-connected parties, whether they are injection (generator) or off-take customers (such as Network Tasman). Connection Charges make up about 11% of Network Tasman’s transmission charges.

Interconnection Charge

Transpower’s Interconnection Charge recovers the balance (89%) of the revenue required for Transpower’s HVAC network (excludes the HVDC link across Cook Strait).

Since April 2008 the Interconnection charge has been levied on Network Tasman’s total demand coincident with the USI top 12 RCPD peak load half hour periods for the 12 months to August of the preceding year. In 2016 this changed, and now it is based on the highest 100 kW demands.

For example, Network Tasman’s Interconnection charge for Murchison’s connection point to the grid for the year commencing 1 April 2018 is calculated as follows:

Murchison’s GXP peaks coincident with USI peaks to 31 August 2017:

USI peak rank 1-100	USI Peak Date	Half Hour Period	Murchison kW
1	12-Jul-17	06:00 PM	1,384
2	12-Jul-17	06:30 PM	1,460
3	12-Jul-17	07:00 PM	1,448
4	12-Jul-17	07:30 PM	1,394
5	12-Jul-17	05:30 PM	1,246
~	~	~	~
96	27-Jun-17	06:00 PM	1,454
97	5-Jul-17	09:30 AM	1,236
98	9-Jun-17	08:30 AM	1,244
99	21-Aug-17	07:00 PM	1,742
100	8-Sep-16	06:30 PM	1,742

Average Murchison kW demand	1,396
TPNZ Interconnection rate, \$/kW	\$113.77
Network Tasman annual Interconnection Charge for Murchison:	\$158,823

3 How Network Tasman’s Group 3 pricing works

Group 3 prices from 1 April 2018

The following table sets out the prices that Network Tasman charges retailers for Group 3 connections relating to the price category 3.4 (ie, the majority of Group 3 connections).

Category 3.4	Unit	Delivery price
kWh pricing		
Summer Day	\$/kWh	0.0138
Summer Night	\$/kWh	0.0073
Winter Day	\$/kWh	0.0354
Winter Night	\$/kWh	0.0073
Demand		
Anytime	\$/kVA/day	0.1612
RCPD	\$/kW/day	0.3285
Reactive charge	\$/kVAr/day	0.2610

Network Tasman prices

a. Anytime Demand price

Anytime Demand prices are billed based on the highest kVA demand half hour measured between 1st January and 31st December the previous year. It includes distribution and transmission components. The minimum chargeable anytime demand for Group 3 is 150 kVA.

The distribution component recovers Network Tasman’s local distribution costs attributable to Group 3 consumers in proportion to each consumer’s anytime peak demands placed on the distribution network.

The transmission portion of the Anytime Demand price recovers the share of Network Tasman’s transmission connection charges attributable to Group 3 consumers.

b. RCPD price

This charge passes through Group 3 consumers’ share of Network Tasman’s annual transmission Interconnection costs. Using the half-hour meter data Network Tasman holds for all Group 3 customers, we determine each customer’s kW demands coincident with the date and time of Transpower’s USI annual top 100 chargeable demands. The Loss Factor adjusts for network losses between the customers own metering point and the Transpower bulk supply metering point (GXP). There is no minimum (kW) level for the Winter RCPD charge.

For example, for **Group 3 Consumer ABC**:

USI DATE	USI Peak Time	Customer ABC Coincident kW
12-Jul-17	06:00 PM	192
12-Jul-17	06:30 PM	153
12-Jul-17	07:00 PM	159
12-Jul-17	07:30 PM	137
12-Jul-17	05:30 PM	154
~	~	176
27-Jun-17	06:00 PM	198
5-Jul-17	09:30 AM	152
9-Jun-17	08:30 AM	140
21-Aug-17	07:00 PM	180
8-Sep-16	06:30 PM	168
27-Jun-17	06:00 PM	192

Consumer ABC Average kW coincident demand	167 kW
Consumer ABC Loss Factor	1.0535
Consumer ABC RCPD Chargeable Demand	176 kW

Network Tasman’s charges are applied using a daily price, so the RCPD charge for Customer ABC at 27.08c/kWh/day, will be $176 * 0.3285 = \$57.82$ per day (\$21,103 for the year).

c. Consumption prices

Consumption (kWh) pricing is used for the distribution component of Network Tasman’s line charges and are applied to kWh consumption levels recorded within each of the four time zones defined below. Consumption is measured on time-of-use meters installed by retailers at consumers’ premises and the meter data is supplied to Network Tasman by electricity retailers each month.

The four time zones are:

Summer Day	0700-2300 from 1 October to 30 April
Summer Night	2300-0700 from 1 October to 30 April
Winter Day	0700-2300 from 1 May to 30 September
Winter Night	2300-0700 from 1 May to 30 September

d. Reactive Charge

Network Tasman requires all connections to maintain a power factor of at least 0.95. Group 3 connections where the power factor falls below 0.95 are likely to incur Network Tasman's Power Factor charge. This is a reactive based charge. The charge each month is based on the minimum reactance needed in that month to ensure the power factor does not fall below 0.95.

The reactive charge from April 2018 is 25.05 c/kVAr. If a connection with a power factor less than 0.95 needed at least 65kVAr, in say June, to bring the power factor up to 0.95, the charge that month would be $65 * 0.2505 * 30 = \$488.48$ ex GST.

This is a "last resort" charge, only levied where Group 3 connections with a power factor do not take steps to improve poor power factor when requested.

4 Load management to minimise charges

Consumption (kWh) charges

Customers can make cost savings by shifting energy use from Day (0700 to 2300) to Night (2300 to 0700).

Anytime Demand Charge

The total Anytime Demand charge is as significant as the RCPD or kWh charge for most Group 3 consumers, so minimising anytime peak loads and maintaining a power factor of at least 0.95 will provide consumers with material cost savings.

Winter RCPD Charge

The RCPD charge from 1 April each pricing year is based on the 100 highest USI peaks occurring in the year to August the year before. Where customers can minimise their loads at critical peak USI grid periods, future Winter RCPD charges will be reduced however it should be noted the USI peak times cannot be predicted with certainty.

Profile of USI Peak Loads

Network Tasman has USI load data for the grid, measured in kW per half hour, since 2006. We have analysed this data to identify any trends that might support load control strategies (which will impact on transmission RCPD)

Any ability to shed load or shift load away from expected peak times during the day will provide an opportunity to reduce future RCPD charges.

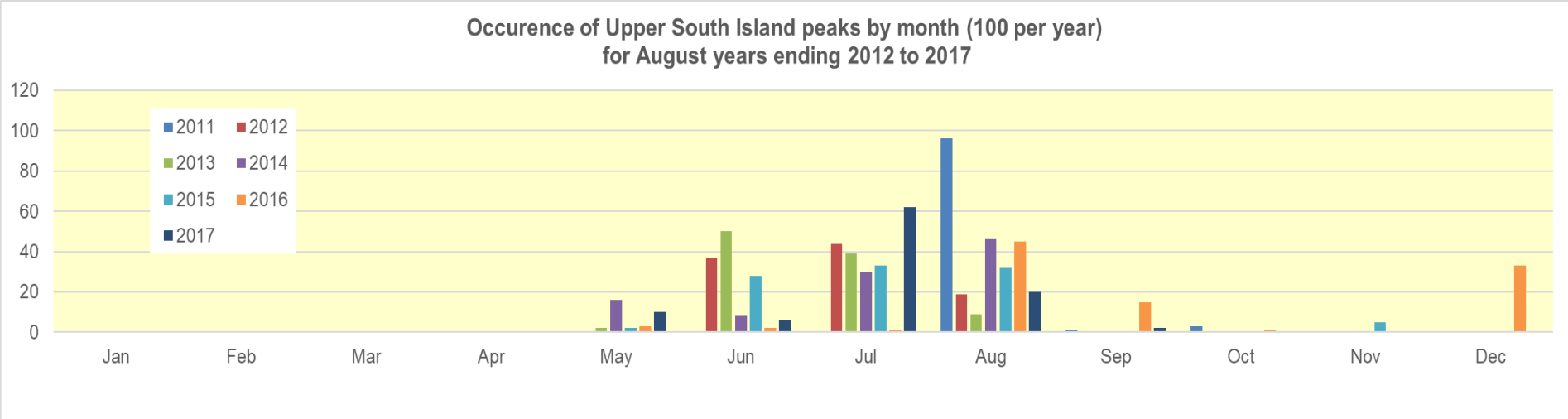
The largest population and load centre in the USI is Christchurch and inevitably its load profile determines the date and time of the USI peaks.

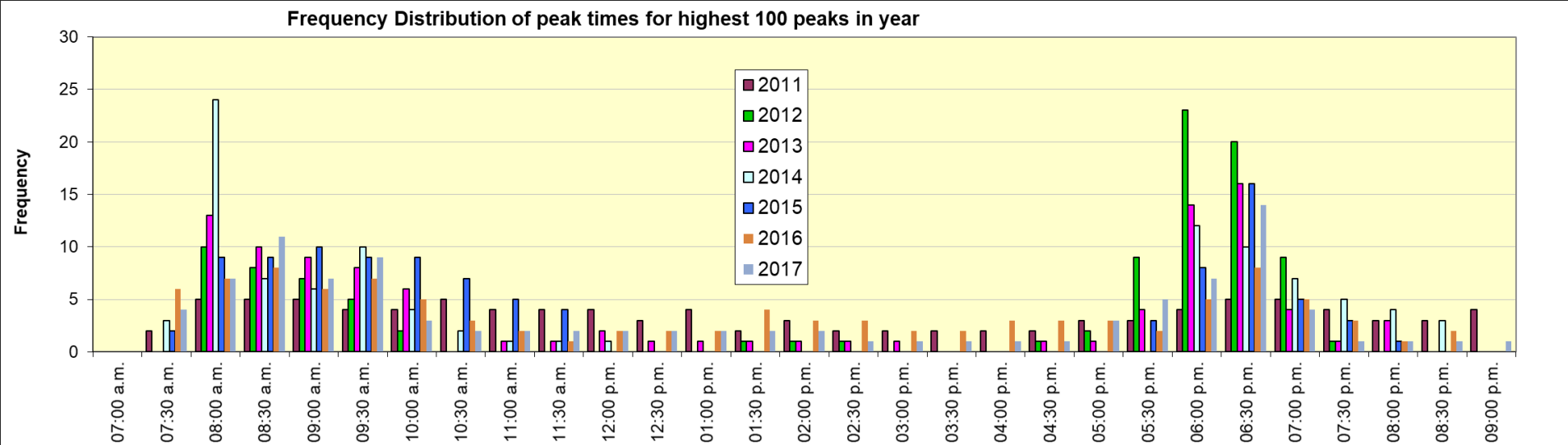
Normally the peaks occur in the winter months of June, July and early August, with a reasonable spread between the morning and evening periods but on weekdays only. Occasionally there are peaks in late May and recently, during particularly dry summers, peaks have occurred in December. Peaks very rarely occur on the weekends or Friday evenings.

In a "typical" winter we would expect mainly early evening peaks, with some morning peaks around 7:30-10am.

A summary of our analysis is provided below.

Highest 100 USI peaks for years ending August 2012 to August 2017





Note: x-axis is half hour ending (eg, 07:30am is the half hour from 7am to 7:30am)

USI Load Data for Winter 2018

Near real-time load data for the USI can be purchased from EMS, a subsidiary of Transpower, who have a web-based package call em⁶. Network Tasman does not subscribe to this service.

Transpower's System Operator makes USI load data publicly available on its website, eg <https://www.transpower.co.nz/system-operator/operational-information/upper-south-island-loads> (Zone 3 Load). Note that 1MW = 1,000kW.

Network Tasman's website home page shows the level of load control Network Tasman is deploying. Network Tasman's load control will approach 100% when peak grid loads are being recorded.

5 Summary

The information above is provided to help Group 3 consumers assess their options to control load and minimise their RCPD demand charges.

Network Tasman has the full data set of the USI load for the last 7 years, if required. Please contact Collin Just on (03) 989 3608 or collin.just@networktasman.co.nz.