

**OTAGO POWER LIMITED**  
**LINE CHARGE PRICING METHODOLOGY**  
**FOR THE FINANCIAL YEAR STARTING 1<sup>ST</sup> APRIL 1999**

**in accordance with Regulation 23 & 24**  
**Electricity (Information Disclosure) Regulations 1999**

***Policy***

Otago Power's line charges are a means of recovering the costs of the line business. They are derived by apportioning the total revenue requirement for the line business operation over all customers. Other than for major customers, the charges to a particular installation are based primarily on:

- an installed kVA capacity rating of that installation
- a km rating indicative of the installation's distance from a population centre
- unit (kWh) rates on energy used by that installation in specific time zones, reflecting peak demand periods mainly.

***Total Revenue Requirement***

The total revenue requirement for the 1999-2000 year is the sum of all network expenditure, components of which are:

• Direct administration	\$456,396
• Depreciation on assets	\$1,058,825
• Interest charges	\$0
• Transmission charges	\$3,231,021
• Distribution maintenance	\$2,532,832
• Corporate services	\$690,038
• Return on assets	\$2,420,702
• Total revenue requirement	<b>\$10,389,814</b>

***Consumer Group Allocation***

The total revenue requirement is divided into six major load groups on the basis of the value of the assets used to supply customers within those load groups. The asset values used were historical book values. The six consumer groups are:

- Major consumers
- Generators
- Domestic consumers
- Commercial consumers

- Maximum demand consumers
- Unmetered loads < 1 kVA
- Street lights

### ***Major Customers***

Three customers are supplied at voltages of 11 kV or higher with a capacity of 19,000 kVA. While none are supplied from completely separate networks, the assets used in the transmission of energy to these customers are identified and valued according to their historical book value.

Costs and valuations of the assets used in conjunction with other customers are apportioned on the basis of the ratio of the assessed maximum demand to the sum of all assessed maximum demands. This capital base is used to determine the following costs associated with each of these customers:

- Direct network expenditure (operating and maintenance costs)
- Depreciation on assets
- Return on assets (profit)
- Indirect Network Expenditure:

Corporate services costs are based on a proportion of estimated total energy, with a cap for the largest customer. Administration costs are based on a proportion of the total charges paid. Building and plant costs are based on a proportion of the assets involved.

- Trans Power Transmission Charges:

Fixed costs at the grid Points of Supply are apportioned according to the ratios of maximum demands of the customers to the total maximum demands. Variable costs, namely Network and Capacity charges, are recovered through similar variable charges, based on units used in winter daytime periods and on maximum demand respectively.

### ***Generators***

There is one generator connection with a total generating capacity of 12,250 kW. The generator has the network charges calculated as the major customers above. The Transmission charges for injection and offtake capacity are also divided according to the ratios of maximum demands. The variable Transmission charges that are avoided by the injection of generator, reducing the offtake, are credited to the generator at the same rates as charged by Transpower.

### ***Domestic Consumers***

These charges were based on 10,600 domestic consumers, all with an assessed capacity of 10 kVA each or 106,000 kVA total. Domestic premises are as defined in section 64 of the Electricity Act 1992.

### **Commercial customers**

These charges were based on 3,650 commercial consumers, with various assessed capacities from 10 kVA upwards and a total capacity of 47,500 kVA. Commercial consumers are those installations that are not defined as domestic premises.

### **Maximum demand customers**

Maximum demand consumers are those commercial consumers who have a maximum demand of greater than 100 kVA together with the appropriate time of use metering. The charges were based on 52 maximum demand customers with a total capacity of 11,360 kVA.

### **Unmetered loads < 1 kVA**

These loads are generally Telecom roadside PCM cabinets using a constant load of less than 1 kVA. There are 95 such consumers.

### **Street lights**

The charges were based on 196 kW of connected streetlights.

### **Cost Allocation to All Consumers**

The asset values and revenues recovered from the three major customers are subtracted from the total asset value and revenue requirement, and the residual figures used for the computation of Line charges for all remaining customers.

Every customer is given an assessed kVA capacity rating and a km rating based upon their straight line distance from a major zone substation or notional zone substation.

All single phase domestic customers were assessed at 10 kVA, farm pumps and other supplies on either the actual dedicated transformer size or the assessed required transformer size. This figure reflects the installed capacity built into the system all the way from the national grid supply point to the customer's installation and is a theoretical maximum demand right to system capacity. It is envisaged that customers may have cause to negotiate a different capacity, especially if they consider a reduction is needed. If this is done, a nominal penalty charge for exceeding the assessed capacity is introduced to discourage unrealistic assessments of installed capacity.

All urban customers (those 5 km or less from a zone substation or notional zone substation) were given a nominal 5 km distance rating.

Having removed the value of those assets used in calculating the cost of supply to major customers, the remaining assets were apportioned between consumer groups according to the following basis:

<u>Section of Network</u>	<u>Basis of Apportioning Total Asset Value</u>
Subtransmission Lines	kVA
Major or zone substations	kVA

Primary 11 kV Lines	kVA*km
Distribution substations	(1.5*Urban kVA + 2*Rural kVA)
Secondary 400 V Lines	kVA*km
Load Control	Per customer

### ***Fixed Charges***

These charges are not truly 'fixed' charges as (i.e. a base fee per consumer which is the same irrespective of size). Instead, all installations are assigned a kVA rating (minimum of 10 kVA, except for 1 kVA and streetlight loads) and the fixed charges per annum are derived from this.

These charges effectively identify the asset value employed to supply all consumers in each of the consumer groups. All costs are then allocated between the groups on the same basis as for the major customers, to provide an individual revenue requirement for each group.

Because the Otago Power network is largely rural, with the largest population centre being Balclutha at less than 2,000 consumers, all charges have been averaged. There is also little difference on the overall distribution costs per customer from the three points of supply, Palmerston, Naseby and Balclutha, so these are also averaged across the whole network.

For rural customers, there is an additional charge to recover the increased costs per consumer as they use greater lengths of line from the major zone substations. This is a small kVA\*km rate applies to consumers outside of a 5 km radius from the major zone substation. This kVA\*km charge is over and above the base charge per kVA for urban customers.

### ***Variable Charges***

Variable charges primarily reflect the charges made by Trans Power for connection to and transmission across the national grid.

The charges are unit (kWh) based and are applied to the energy consumed during the daytime hours (7 am - 11 pm). Two different rates are set, one for summer months (namely October to April inclusive), the other for winter months (May to September inclusive). The higher winter rate is a reflection of the recovery of transmission charges which are mainly based on demands during winter daytime periods.

Under the initial derivation of line charges, the variable charges were entirely attributable to the recovery of transmission costs. When Trans Power charges were reduced, these variable charges were reduced also, but a small portion of the revenue collected through these charges is now attributable to costs other than grid transmission. It has been considered preferable to adjust these variable rates and leave the fixed charges unaltered. The rates for these variable charges are therefore determined by setting rates which are estimated to provide income equal to the difference between the total revenue requirement and the estimated revenue to be collected from the fixed components of the line charges.

<b>Load Group Quantities</b>								
	Major Cust	Generators	Domestic	Commercial	Max Demand	<1kVA	Street lights	TOTAL S
<b>VARIABLE</b>								
Winter Day MWh	0	0	18,000	9,000	4,800	43.3	192.8	32,036
Summer Day MWh	0	0	26,000	13,000	9,600	85.2	284.6	48,970
Max Demand kVA	0	0	0	0	6,570	0	0	6,570
<b>FIXED</b>								
Capacity kVA	19,000	12,250	106,000	47,500	11,360	95	196	196,401
<b>ZONE</b>								
KVA*km	0	0	205,500	214,870	17,500	0	0	437,870
<b>TRANSMISSION</b>								
Capacity kVA	19,000	12,250	106,000	47,500	11,360	95	196	196,401

<b>Load Group Revenue Allocation (\$000s)</b>								
	Major Cust	Generators	Domestic	Commercial	Max Demand	<1kVA	Street lights	TOTAL S
<b>VARIABLE</b>								
Winter Day MWh	0	0	687.6	343.8	144.0	1.65	7.36	1,184.4
Summer Day MWh	0	0	993.2	496.6	120.0	3.25	10.85	1,623.9
Max Demand kVA	0	0	0	0	108.4	0	0	108.4
<b>FIXED</b>								
Capacity kVA	237.0	107.8	2,063.8	1,520.0	221.5	9.00	29.40	4,188.5
<b>ZONE</b>								
KVA*km	0	0	24.7	25.8	2.1	0	0	52.6
<b>TRANSMISSION</b>								
Capacity kVA	1,415.0	268.0	994.0	445.5	106.5	1.00	2.00	3231.0
<b>TOTAL</b>	1,652.0	375.8	4,763.3	2,831.7	702.5	14.90	49.61	10,389.8