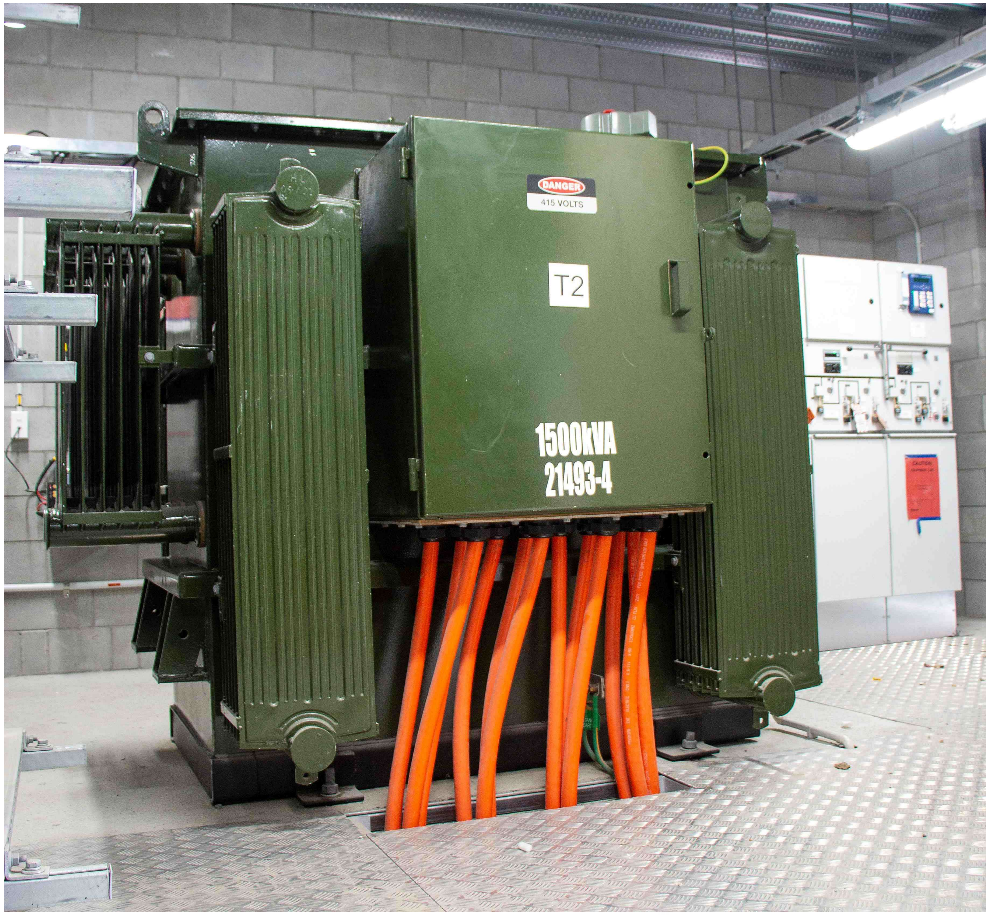
Electricity Invercargill Ltd

Distribution pricing roadmap

June 2023



Price reform to support future electricity trends

Electricity Invercargill Limited (EIL) is working towards distribution prices that send better signals about the cost of using our network. Doing this can help keep distribution costs and prices down in future, by providing consumers with incentives to use electricity networks more efficiently, reducing or delaying the need for additional investment.

EIL's annual target revenue is set to recover the costs of owning and maintaining the network and must be compliant with the Commerce Commission's Default Price-Quality Path Determination. The Commission's Determination effectively sets a cap on EIL's revenue. The revenue requirement is then used to determine price levels.

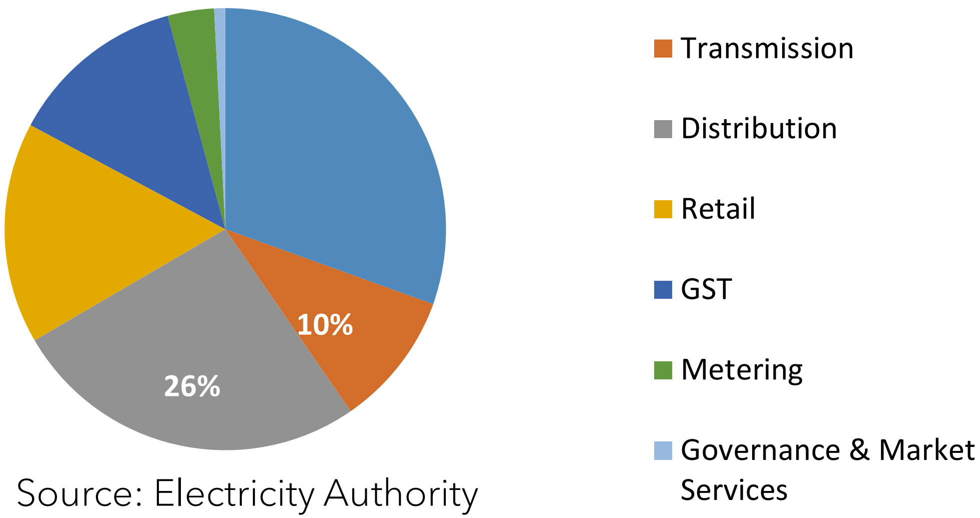
While the company's total revenue is driven by its cost assessment, the focus of pricing reform is ensuring not only that the level of prices and revenues are cost-reflective, but also that price structures signal underlying cost drivers. Ensuring that price signals are accurate will become even more important in a future context where electricity is likely to be used and generated differently than it has in the past.

This roadmap has been prepared to provide the Electricity Authority, electricity retailers and consumers an understanding of what changes we have made to our pricing structures and how we plan to continue to monitor and evolve our pricing to meet the ever-changing environment.

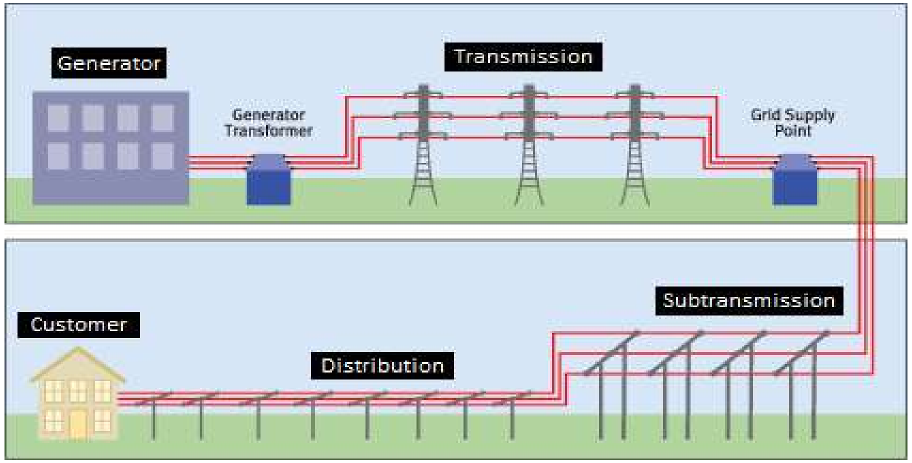
Our role in delivering electricity

As an electricity distributor, we are responsible for distributing electricity from the transmission network grid exit points (GXPs) through local medium and low voltage networks to electricity consumers. Increasingly, distributors are also re-distributing electricity generated by consumers on their network from DG (Distributed Generation).

Components of total retail price



Source: Electricity Authority



Our prices recover the cost of: (1) our distribution network; and (2) the national transmission grid. Charges from Transpower to distributors for the use of the national grid are passed to retailers in the form of a combined network charge.

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.

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Residential & General consumer pricing

Our pricing to residential and general customers includes a daily charge and a usage charge (per kWh)

Service based daily charges

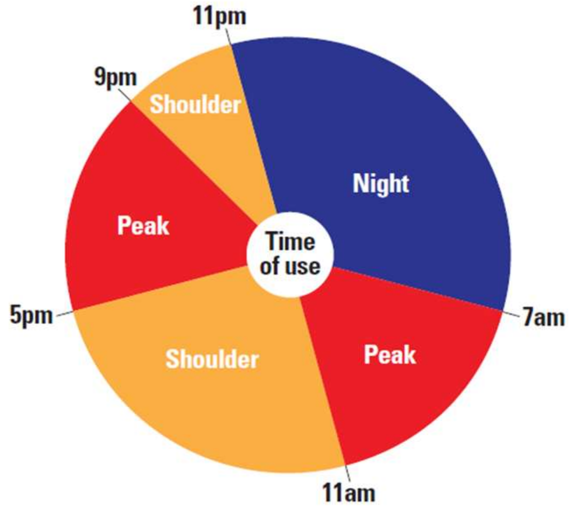
Daily charges vary according to:

- **Capacity:** 8kVA or 15 kVA for residential. For General customers, there are a range of capacity options up to 100 kVA.
- **Controlled load:** Whether the connection has 25% or more of its usage controlled (eg, hot water).
- **Low user:** Whether the customer qualifies as a residential Low User (less than 9000 kWh p.a.). Regulations limit the daily fixed charge to Low User.

New Time-of-Use structure

Usage (kWh) charges vary according to the time of day

EIL introduced a time-of-use structure from 1 April 2022 to move to more cost-reflective pricing, with the peak, shoulder and off-peak times shown below. Our time-of-use pricing rewards customers for shifting usage to off-peak periods.



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Individually priced consumers

Pricing approach

Pricing for Individual customers is considered to be highly cost reflective. As a result, changes to the way in which prices are determined for these customers is not anticipated in the near future.

There are a number of consumers for which we calculate an individual connection-specific line charge. These connections are currently 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.

We calculate the individual prices every year and apply them as a daily charge and usage charges. These prices are calculated 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. Specific measures used in the individual price calculations include:

- The Contract Capacity kVA (kW) of the installation
- Peak demand kVA (kW) (0700-1100 hours and 1700-2100 hours, each weekday during sub-transmission peak months of individual grid exit points)
- The Peak energy MWh. (0700-1100 hours and 1700-2100 hours, each weekday during sub-transmission peak months)
- The Winter Day energy MWh. (0700-2300 hours, May to September)
- The Summer Day energy MWh. (0700-2300 hours, October to April)
- The Total energy for the 12 month period MWh.

Evaluation of existing price structure

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.

From 1 April 2023, we changed the way that we pass through transmission charges to reflect the new Transmission Pricing Methodology. Previously we had passed through most transmission charges through a coincident peak demand charge that applied during Transpower's 100 highest peaks for the lower South Island.

The future recovery of the individual line charges is to progressively recover more of the costs through the fixed daily charge.

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Our pricing reform progress

In our 2020 roadmap, we identified two key challenges:

(1) how to improve time-of-day signals regarding peak times on the network that are likely to drive future investment; and

(2) ensuring that recovery of costs that are not demand-driven do not distort usage.

Since then, we have made substantial progress in addressing these challenges by:

- Implementing a TOU pricing structure for residential and general connections from 1 April 22.
- Rebalancing fixed and variable prices for residential and general customers, so that a greater proportion of cost is recovered from fixed charges. Our ability to address this objective has been aided by the phase out of the LFC regulations over a 5-year period that commenced from 1 April 2022.
- Changing the way that we pass through transmission charges, so that allocations to customer groups and individual customers are no longer based on regional coincident peak demand. EIL has accordingly increased the proportion of revenue from customers that is collected through a fixed charge.

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Pricing reform roadmap

Phase 1: Implement TOU pricing structure	Phase 2: Rebalance fixed and variable charges	Phase 3: Refine peak TOU signals	Phase 4: Pricing innovation to support decarbonisation & network congestion
Complete	In progress: 2022 to 2027	Upcoming: 2023 to 2025	Upcoming: 2023 onwards
1. Consultation 2. Billing engine development and testing 3. Develop TOU pricing model 4. Model consumer impacts 5. Communication with retailers and consumers 6. Address contractual and technical issues 7. Implementation – 1 April 2022	1. Pass through of TPM pricing to customers - complete 2. Price rebalancing according to LFC phase-out – ongoing 3. Increasing the recovery of costs through the fixed charge - ongoing	1. Assess consumer response to peak TOU price signals 2. Use information on expected network congestion and investment to guide peak price levels	1. Develop EV pricing options 2. Examine more targeted price signals (if required) 3. Review capital contributions approach

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Phase 1: Implement TOU pricing structure

Our Installed Capacity and completed implementation of Time of Use pricing for residential and general consumers provides a structure for passing signals to consumers on the difference in economic costs by time of consumption

This structure has the following benefits:

- ✓ Signals times during the day when the network is at peak loading and times when there is there is spare capacity in the network.
- ✓ Provides choice for customers on when and how much they pay for their electricity, by proving lower charges at shoulder and night times.
- ✓ Provides an incentive for load shifting out of peak times that will help avoid or delay expensive network upgrades keeping the costs down for everyone.
- ✓ Is more easily understood by customers than other cost reflective pricing structures (such as demand charges).
- ✓ Is flexible to adapt to the changing electrification environment we are facing.
- ✓ With Installed Capacity and TOU we can adjust our cost recovery between fixed and variable charges to align to our expected costs and investments.
- ✓ Customers that opt for controlled service receive the benefit of lower daily charges. This allows EIL to shift load away from demand peaks where there are system constraints – for example, to manage GXP load when maximum demand reaches the capacity of that GXP, and to manage load on feeders.

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Phase 2: Rebalance fixed and variable charges

Our ongoing rebalancing of fixed and variable charges better reflect costs and will reduce distortions

- Our costs are largely fixed and use of the network outside of peak times has little effect on required investment. By shifting cost recovery from usage charges to fixed daily charges and introducing TOU pricing, customers will pay less to use electricity, particularly outside of peak periods.
- We have been rebalancing fixed and variable prices according to the phase-out of the LFC regulations and will continue to do so.
- The TPM has been revised to remove overly strong peak signals and recover a greater proportion of transmission grid costs through charges that are essentially fixed. We have changed the way that we allocate costs to customer groups and to Individually Priced customers. We have accordingly increased the proportion of transmission charges that are recovered through fixed charges from customers.

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Phase 3: Refine peak price signals

We will refine peak charges to better reflect the level of congestion and consumer response

- We are developing congestion analysis practices to ensure network congestion is understood. Minimal additional points of network congestion are anticipated from this analysis as existing practice has been to upgrade capacity to meet peak demand and distributed generation penetration has not yet reached levels that cause constraints.
- Once we have developed a congestion analysis methodology sufficiently, this will be combined with forecasted growth and uptake of key technologies to understand the impact on network congestion.
- We will use the insights from the forecasted congestion analysis to inform timeframes for the need to signal congestion. We expect significant network congestion to be several years away however we understand the need to develop congestion management tools well ahead of issues arising.
- As TOU beds-in, we will observe the extent to which these signals are visible to consumers (whether TOU is passed through to retailers), and to what extent consumers choose to respond. This will inform our assessment of how strong peak signals should be. We will consider adjusting the strength of TOU price signals to achieve the necessary response from customers to efficiently manage network constraints. This will take into consideration the option to upgrade the network where customer's response to price signals indicates upgrades become the more appropriate option.
- We may look to increase options for control schemes that target additional DER such as EVs as an evolution of traditional 'Off-Peak' pricing allowing load control (predominantly hot-water) to enable direct constraint management. We will consider further price innovation options over time that may include greater granularity and more dynamic pricing options for customers to help customers and DER owners to realise value from flexibility services they may provide.
- We will also further examine optimal peak pricing levels, informed by the level of congestion and the extent of planned investment to address forecast demand growth. This could include, for example, developing Long-Run Marginal Cost estimates to inform pricing.

Phase 4: Innovative pricing

Examine other pricing mechanisms that could be offered to support decarbonisation loads

EV pricing options

EV uptake is currently low in Southland but will accelerate. EVs have the potential to have large impacts on network demand with sufficient adoption, triggering greater investment. This effect will be greatest on the suburban low-voltage (LV) network in built-up urban and semi-urban areas. The upstream medium voltage (MV) network generally has sufficient capacity to allow for the forecast increases in load from EVs.

TOU pricing provides one way to encourage EV users to charge during off-peak periods. To complement TOU and Installed capacity pricing, an additional pricing option for EV users could be a controlled load connection. Similar to existing hot water load control, customers would pay a lower charge for a connection that has reduced availability during peak periods. This could be more efficient than TOU because it would only suppress demand when the network is congestion.

More targeted pricing signals

Other innovative pricing or rebate structures could be explored as add-ons to the existing pricing structure to provide more locationally-specific signals of congestion, if required in future.

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Phase 4: Innovative pricing

Examine other pricing mechanisms that could be offered to support decarbonisation loads

Review capital contributions approach

EIL expects to conduct a review of its capital contributions methodology within the next 2 years.

Where First Mover Disadvantage (FMD) issues arise, we address these on a case-by-case basis. We expect to further consider our approach to FMD as part of our capital contributions methodology review.

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About Electricity Invercargill

EIL is an electricity network asset company formed in 1991. The company is owned by the Invercargill City Council through its subsidiary company Invercargill City Holdings Ltd (ICHL). It is a wholly owned subsidiary of Invercargill City Holdings Limited (ICHL).

EIL owns the electricity network assets in Invercargill City and the Bluff township area. A geographically compact network, EIL supplies more than 17,400 connections to residential, commercial and industrial customers.

The high proportion of underground cabling means that the EIL network consistently performs as one of the most reliable networks in New Zealand.

Transpower's Invercargill Transmission Grid Exit Point (GXP) substation is the 33 kV supply point for both the Invercargill and Bluff network areas. In addition, a limited backup supply is available from the North Makarewa GXP. Bluff is supplied at 11 kV via The Power Company Limited's (TPCL's) overhead sub-transmission lines, and the Bluff zone substation.

EIL's distribution network includes 23km of 11kV lines and 155km of 11kV underground cables. With more than 400 distribution substations, comprising 11 kV switchgear and distribution transformers, the distribution network supplies over 450 km of low voltage network operating at 400/230 V.

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EIL contracts PowerNet Limited to manage the network assets of EIL in accordance with a Network Management Agreement. PowerNet is an incorporated joint venture owned by EIL and TPCL. This arrangement allows EIL to achieve cost efficiencies, as a number of overheads can be shared across the networks managed by PowerNet (EIL, TPCL, OJV and ESL). This arrangement also enables alignment in pricing strategy across these networks.