

Distribution pricing roadmap

April 2021



Price reform to support future electricity trends

The world is currently experiencing a pandemic caused by a new strain of coronavirus: COVID-19. This is already affecting our supply chain, the availability of resources and customer demands. The effects on the economy and the restrictions imposed by the Government to address the pandemic could significantly affect the timing and nature of any proposed pricing methodology changes set out in this roadmap.

The Power Company Limited (TPCL) 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.

TPCL's annual target revenue is set to recover the costs of owning and maintaining the network. 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.

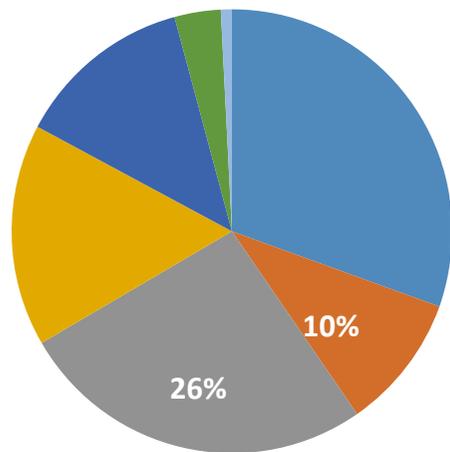
This roadmap has been prepared to provide the Electricity Authority, electricity retailers and consumers an understanding of what changes we are looking to make to our pricing structures and how we plan to implement those changes. The Authority has encouraged all distributors to produce a roadmap and has expressed the view that distribution pricing reform should be a priority for the electricity sector.

The Low Fixed Charge (LFC) regulations were recommended to be amended following the Government's Electricity Pricing Review. The Minister has indicated that changes will be made, however it appears this will not be until 1 April 2022. Changes to the present recovery of costs through a fixed daily charge cannot be contemplated until there is certainty regarding the reform of these regulations.

Our role in delivering electricity

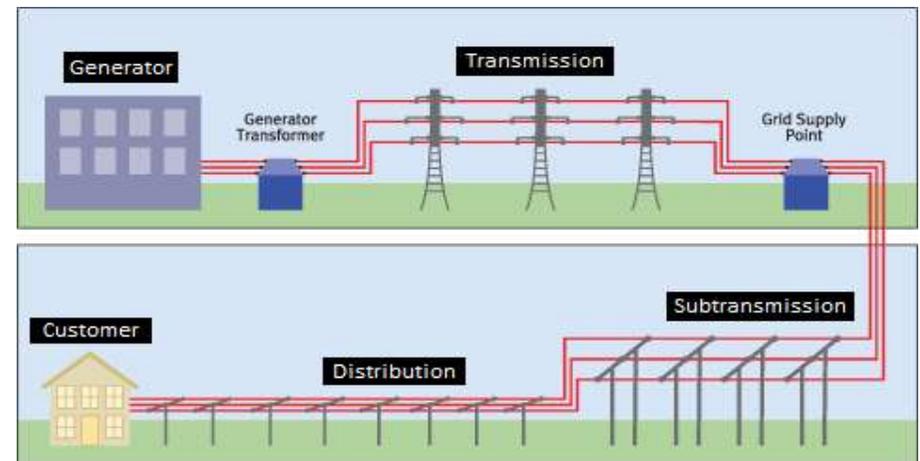
As an electricity distributor, we are responsible for distributing electricity from the transmission network grid exit points (GXPs) through local medium and low voltage networks to electricity consumers. Increasingly, distributors are also re-distributing electricity generated by consumers on their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

Components of total retail price



Source: Electricity Authority

- Generation
- Transmission
- Distribution
- Retail
- GST
- Metering
- Governance & Market Services



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.

Residential & General consumer pricing

Existing pricing structure

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

Daily charges vary according to:

- **Capacity:** 8kVA or 15 kVA for Residential. A range of options up to 100 kVA for General.
- **Location:** Whether the connection is in an urban or rural area
- **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.)

Usage (kWh) charges only apply during the “Day” period: 7am to 11pm.

Current price levels recover a larger percentage of revenue from usage (kWh) charges than from the fixed charges, this includes the Residential Low Users because regulations limit their daily fixed charge to 15c per day.

Evaluation of existing pricing structure

The Day/Night energy price component provides a strong signal to consumers to utilise spare network capacity at night. This is a legacy pricing structure that was able to be passed to end consumers through Day/Night meters. The mass deployment of smart meters opens up opportunities to provide more accurate signals about when peaks are most likely to occur – mornings and evenings. Implementing TOU is a key focus of TPCL’s price reform programme, with the ability to potentially defer future network investment and provide better signals regarding the investment in, and use of, evolving technologies.

The use of an urban/rural distinction reduces the potential for cross-subsidies. While greater granularity could be introduced, TPCL is of the view that the urban/rural distinction is the most pragmatic approach for residential customers at present.

The lower daily price for connections with controlled load reflects that load control is used to: (1) minimise Transpower charges by controlling the network load during the Lower South Island peaks; (2) manage GXP load when maximum demand reaches the capacity of that GXP; and (3) manage load on feeders.

TPCL’s use of capacity charges is a way to recover sunk and fixed costs, with minimal distortion, while being arguably fairer than a single fixed charge for all connections. The availability of both 8 kVA and 15 kVA provides choice to residential consumers. The level of daily charges is a key opportunity for improving the efficiency of TPCL’s pricing, however the LFC regulations remain a barrier to this.

Individually priced consumers

Existing price structure

There are 282 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. 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.
- Coincident Peak demand with Transpower's 100 highest peaks for the lower South Island (kVA).

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.

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.

Governance structure for pricing reform

- As pricing reform is a strategic priority, the networks managed by PowerNet have established a Line Pricing Board Sub-Committee to guide the method in which these networks recover line revenue in a cost-reflective and efficient way.
- The composition of members ensures representation of network owners, being one each from TPCL, Electricity Invercargill Limited (EIL), Otago Joint Venture (OJV) and Electricity Southland Limited (ESL). PowerNet Senior management attends committee meetings, including the Chief Executive, Chief Financial Officer, Commercial Manager and other members as and when required.
- A detailed Terms of Reference specifies the authority, scope, duties and reporting required from the Committee. It also states the following purpose:

The Committee is to ensure the Boards meet their responsibilities in relation to the appropriate recovery of total revenue while sending clear price signals to consumers about the cost of using the network to help consumers decide to adjust their use of the network to ensure network investments are efficient while considering the various stakeholder views including customers, retailers, shareholders, electricity industry regulators and Government (policy statements).

Scope of Line Pricing Board Committee (from Terms of Reference)

The Committee will be responsible for providing direction and review on the Line Pricing Methodologies while taking into account:

- Customer, retailer and shareholder views
- Compliance with legislation, standards, regulations, policies and procedures
- Electricity Authority views of efficient distribution pricing
- The Government electricity price review and subsequent Government Policy Statements
- New technology changes including embedded generation and electric vehicles
- Electricity Networks Association Distribution Pricing Working Group
- Individual views from EIL, TPCL, OJV and ESL Boards
- Commerce Commission views on allocative efficiency

The Committee shall take into consideration in making its recommendations to the respective Boards:

- Low fixed charge regulations
- Data availability and metering capacity
- Data analysis and revenue modelling
- Potential customer price shocks
- Tariff options including fixed and variable, capacity charges, day night, urban rural, time of use etc.
- Pricing approaches by other electricity distribution businesses
- Billing software capability
- Price and revenue paths and the April 2020 price reset
- Discounts offered by TPCL
- Transmission pricing methodology (TPM) changes
- Revenue risk from customer response to tariff changes

Working towards efficient pricing

Network investment and the resulting cost of supply are not driven by the total amount of energy used by customers. However, the timing of network use is important because network capacity is built to meet peak demand, which typically occurs during the morning and evenings.

Currently, most of our consumers are charged a daily charge as well as a charge that is applied to energy use (kWh) during Day periods (7am to 11pm). Although our Day/Night price structure does correctly indicate that the Night period is a quiet period on our network, the deployment of smart meters means that the time-of-day pricing signals can be improved to better indicate when peak network demand is most likely to occur.

Extensive evaluation of cost reflective and service based pricing structures has been completed, based on the following criteria

1. Economic Efficiency
2. Actionable and Simple
3. Supports Retail Competition
4. Durability and Flexibility
5. Stable/Predicable

From this evaluation we are aiming to implement a combination of installed capacity and time-of-use (TOU) pricing. Following this decision a comprehensive customer impact analysis has been completed, which involved overlaying all our ICP's with the NZ Deprivation index, allowing customer impact to be analysed down to specific decile levels, we also looked at what the impact would look like in 5 and 10-years time. Three other cost reflective pricing options were also evaluated at the same time. Installed capacity and TOU ranked first as likely to have the least customer impact.

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 networks such as charging electric vehicles (EVs) 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.

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

While efficiency and cost-reflectivity are key goals, there must be a degree of pragmatism when deciding on price structures.

Our pricing strategy

There are two key challenges for our pricing strategy: (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.

Challenge 1 has been addressed by comprehensive analysis of and customer impact of TOU pricing.

Our ability to address the second challenge is limited by the LFC regulations. Changes to the LFC regulations were recommended by the Electricity Pricing Review, and the Minister has indicated that these regulations will be amended. It appears that any changes are unlikely to enable a transition away from the existing 15c cap on residential low user daily prices until at least 1 April 2022.

The Line Pricing Sub-committee has recommended to the TPCL board of directors that TPCL changes its pricing methodology to a combination of Installed Capacity and TOU for all residential and general customers, subject to the government signaling the end of or phase out of the Low User regulations. This recommendation has been approved by the TPCL board.

We note that the proposed changes are subject to customer consultation.

Our operational plan for pricing reform

Phase 1: As part of the shared pricing reform across the networks managed by PowerNet, TPCL intends to continue to develop Installed Capacity and TOU pricing over the next year, with the target of implementing for residential and general consumers from 1 April following the announcement of the removal or phase out of the Low User regulations.

In what follows, we set out a detailed operational project plan for achieving that target date, highlighting which tasks have been completed and what the focus for the next year will be.

Phase 2: The timing will be contingent on regulatory changes. In addition, it is unlikely to have the same array of operational implications and complexities as TOU does. As further clarity around the necessary regulatory changes becomes available, TPCL will develop the necessarily timelines and plans to work towards implementation. As members of the ENA, we continue to be informed by analysis conducted by the ENA's working groups on LFC transition paths.

Phase 1- Detailed Project Plan

- Initial engagement with retailers has occurred seeking support and feedback on best practice to implementing a change to TOU and how the necessary data will be provided. An outcome of that engagement is that we are introducing new loss codes to identify low user energy at a GXP level.
- A further stage of retailer consultation will occur later in 2021, along with consultation with consumer representatives.
- Learnings have been made from engaging with another GXP-billing network that has implemented TOU.
- A significant amount of work has occurred on developing a billing system that will enable TOU billing. Ongoing testing is occurring, and this will be followed by parallel billing on the new and old tariff structures to ensure that the system is fully operational by April 2022.
- PowerNet has reviewed its staffing requirements, including consultant support

	2019	2020	2021
Consultation			
	Review with PowerCo of their TOU (GXP billing) implementation		
	Initial retailer consultation		
	Review and evaluate retailer feedback		
		Consult with retailers on proposed final tariff structure	
		Consult with customers	
		Consult with shareholders	
Billing Module			
	Billing engine testing		
		Existing billing running in parallel	
		Detailed billing arrangements for TOU evaluation	
		Review EIEP data file change requirements	
		Test new tariff structure billing	
		Bill new tariff structure in parallel	
Resourcing			
	Review staffing requirements for project		
	Consider consultant support		

Phase 1 – Detailed Project Plan cont'd

- Pricing and preparatory analysis for TOU pricing were particular areas of focus in 2020, including by PowerNet (on behalf of TPCL) as well as drawing on analysis prepared by the ENA.
- Further work for 2021 includes completion, running and testing the TOU pricing model, and assessment of the likely changes in consumption patterns that may arise from TOU pricing.
- Customer impact analysis has been completed during 2020.

	2019	2020	2021
Pricing			
		Review current pricing model	
		Develop TOU pricing model	
	Low User considerations		
	Fixed/Variable charge split		
	Default tariffs (non-smart meter)		
	GXP vs ICP based billing		
		Consider how to do washups	
	Load control incentives		
	Urban/Rural pricing		
		Mandatory or voluntary	
	Consider DG export charge		
	Consider PV and EV charging		
	Price shock consideration		
Analysis			
	Review all ENA working group information		
	Review other Distributor implementation lessons		
	Review historical consumption data		
	Model consumption patterns existing and future with TOU		
	Test and run TOU pricing model		
	Analyse smart meter programming for TOU		
	Procure HH data on PV & EV for analysis		

Phase 1 – Detailed Project Plan cont'd (2)

- As the implementation of TOU pricing nears its go-live date of 1 April 2021, communication with consumers in conjunction with retailers will occur.
- There are a number of external factors that affect distributors pricing reform. Looking forward, these include: (1) decisions on the structure of Transpower's transmission charges, which has implications for how these should be passed on by distributors; (2) when/whether changes to the LFC regulations occur; and (3) whether there are additional implications for distribution pricing that arise from the recommendations of the Electricity Pricing Review.

	2019	2020	2021
Communication			
		Consider implementation timing	
			Disclose and communicate pricing to retailers
			Publicity to consumers
	TPC, EIL & OJV Board updates & approvals		
Contractual			
		Review UoSA for any required changes	
Technical			
	Data storage requirements		
	Smart Meter Rollout complete		
External factors			
	EA Pricing Principles & Practice Note		
	Review alignment with Pricing Principles		
	Electricity Pricing Review	Potential for Government Policy Statement/Regulatory change	
	TPM consultation	Potential for changes to TPM	

About The Power Company Limited

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 36,000 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 ICPs per km, TPCL has the second lowest line density of NZ's 29 electricity distribution networks.

Taking supply from 4 Transpower grid exit points and a number of generators, TPCL's sub-transmission network, including 460km of 66kV lines and 445km of 33kV lines and underground cables, connects to its 37 zone substations which transform High Voltage (HV) to Medium Voltage (MV). Its distribution network consists of approximately 6,710 km of 11kV lines and 230km of 11kV underground cables. Around 10,500 distribution transformers connect the Low Voltage (230V) network, which has 850 km of lines and 230km of underground cable.



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