

Memo

To John Harbord and Ralph Matthes
CC
From Mike Hensen
Date 17 October 2018
Subject Electricity Distribution Business Charges to Retail Consumers

Purpose

This note is a short review of the modelling of the allocation of electricity distribution (EDB) charges to retail customers described in the technical paper¹ supporting the draft report of the Electricity Price Review and the copy of the model² provided by the Electricity Price Review secretariat.

This note compares the analysis and modelling in the technical paper to the information on costs of service models (COSM) published annually by EDB as part of their pricing methodology disclosure. The comparison is based on the 2017 pricing methodologies for 15 EDB with more than 30,000 installation control points (ICP). These EDB together accounted for about 89 percent of ICP and 87 percent of energy delivered in the year to 31 March 2017.

Technical paper modelling

The modelling supporting the analysis in the technical paper is based on share of energy usage with a simple percentage adjustment for peak demand. However, this approach:

- only indirectly considers what EDB regard as the key driver of their cost - capacity to meet peak demand and also oversimplifies the variation in cost drivers across EDB.
- the mismatch between the modelling approach used in the technical paper and the actual methodology used by EDB to allocate costs (to comply with efficient pricing principles) raises questions about the validity of the assessment in the paper that:

Compared with usage²⁰, we found businesses were paying, on average, less than a proportionate share of distribution charges, and residential consumers were paying more.

(²⁰ 'Usage' is based on both peak kW demand and annual kWh aspects of network usage.)

The following table summarises the four steps in the technical modelling paper process and comments on how each step compares to the generic approach used by EDB.

¹ 'ELECTRICITY PRICE REVIEW HIKOHIKO TE UIRA, TECHNICAL PAPER To accompany FIRST REPORT, 30 August 2018' pages 9 to 16

² The spreadsheet 'Cost_Allocation_ComComDisc_v05'

Table 1 Technical paper model process–

Comparison of technical paper modelling process with EDB pricing methodology approach

Modelling step	EDB approach	Comment
<p>Zero. Import EDB billing data where from Commerce Commission disclosure.</p> <p>Selection criteria are:</p> <ul style="list-style-type: none"> • EDB have reported transmission and distribution charges separately • pricing plans could be identified as exclusively residential 	<p>EDB billing information is based on EDB COSM. Both the cost allocators and the weight attached to them allocators vary across EDB.</p> <p>Selection criteria could have been broadened if EDB pricing methodology COSM data was used as they report transmission pass-through cost and explain the make-up of billing groups in detail.</p>	<p>EDB customer group classifications are more granular than residential or business. Also, the characteristics of business (industrial vs commercial) and residential (urban vs rural) vary widely across EDB.</p> <p>Most of the EDB pricing methodologies references to cross-subsidy relate to either urban/rural cross subsidy or the effect of low fixed charges.</p>
<p>One. Compare the share of EDB revenue collected from residential and business customers with their share of energy supplied.</p>	<p>‘Share of peak demand’ rather than ‘energy supplied’ is the main allocator used by EDB</p>	<p>There is no simple or uniform linkage between link between the cost of model allocation of cost to customer groups and energy used by customer groups</p>
<p>Two. Identify factors driving a ‘disproportionate’ cost-allocation – shared network assets, peak demand and costs that are only applied to some customers.</p>	<p>EDB COSM address the allocation of shared asset costs and other operating cost in detail based on EDB experience of what drives costs changes.</p>	<p>EDB that uses energy supplied as an allocator also used sharer of number of ICPs. Some EDB also used circuit length as an allocator or separated their networks into low and high cost areas.</p>
<p>Three. Estimate the subsidy-free range of cost allocations by making fixed assumptions about peak demand costs, non-demand driven network costs and high voltage network use from Orion and Wellington Electricity Lines data.</p>	<p>EDB allocators and weightings vary widely due to differences in the mix of industrial, commercial and rural customers and differences in customer density.</p>	<p>The assumptions about cost do not reflect the range of values for these allocators where they are used by other EDB or the other cost drivers used by EDB.</p>
<p>Four, Impact of different cost allocations based on:</p> <ul style="list-style-type: none"> • mid-point between incremental and standalone costs • residential customers pay incremental costs and businesses pay standalone costs. 	<p>EDB methodologies comment on testing whether pricing lies between incremental and standalone costs but generally do not calculate the incremental and standalone cost for different customer groups.</p>	<p>The range between standalone and incremental costs (for the EDB that calculate these costs) is wide. The technical paper does not explain why the top-down ‘mid-point’ and ‘incremental’ cost allocation for residential customers is a better estimate of residential customers’ effect on EDB cost than EDB ‘bottom-up’ estimates.</p>

Source: NZIER

Using the best data

The EDB pricing methodologies provide a more detailed starting point for assessment the rationale for EDB pricing than the modelling in the technical paper. In particular, EDB pricing methodologies:

- include detailed information on cost allocation across customer groups with a description of each allocator and in most cases a value for each allocator. This provides much more exact information on the indicator used and its value than is used in the modelling for the technical paper.

- use different cost allocators (e.g. peak demand, energy usage, number of ICPs etc.) for different types of cost (e.g. return on network assets, maintenance and overheads)
- assess their pricing against Electricity Authority principles which include:
 - a) Prices are to signal the economic costs of service provision, by:*
 - i. being subsidy free (equal to or greater than incremental costs, and less than or equal to standalone costs), except where subsidies arise from compliance with legislation and/or other regulation;*

The following table summarises the main COSM allocators used by the 15 EDB pricing methodologies reviewed for this note.

The main allocator of network asset costs and network operating expenditure is the estimated share of 'peak demand' which in turn is measured differently for different customer groups to reflect how different mixes and densities of customer demand for network capacity affect the size and shape of the network that EDB provide. Energy usage and number of ICP are only used by some EDB and then only for costs that where these factors actually drive the EDB cost.

Table 2 EDB cost allocators subjected to price/quality regulation

Cost is allocated using customer group share of the allocator listed

EDB	Peak demand ¹	Installed Capacity	Energy supplied	ICP number	Value of Lost Load
Vector	HV assets. LV assets (partial) Transmission costs.		Non-asset costs. LV assets (partial).		
Powerco	Operating, capital and transmission costs - (80% weight)			Operating, capital and transmission costs- (20% weight).	
Orion	Capital, operating and admin costs.				Contingent asset costs.
WELL	Transmission and capital costs		Some operating and other pass-through ² cost.	Some operating and other pass-through ² cost.	
Unison	Operating, capital and transmission costs.			Other pass-through ² costs.	
Aurora Energy	Operating, capital and transmission costs.			Other pass-through ² costs.	
Network Tasman	Direct operating, capital and transmission costs.	Indirect operating cost.			
Alpine Energy ³	Direct operating, capital and transmission costs.			Non network costs.	
Top Energy	Direct operating, capital and transmission costs.		Non network costs?	Non network costs?	

Notes:

1. EDB use several measures of peak demand (coincident, anytime maximum, after diversity maximum and winter and summer) to reflect the pressures on network capacity caused by different customer groups.
2. Other pass-through costs are usually limited to Electricity Authority and Commerce Commission levies but sometimes also include local body rates.
3. Alpine Energy assigns its customers to load groups according to: location (low or high cost area), fuse size at the ICP, maximum business day peak demand and type of meter. This grouping is applied before the allocators listed in the table.

Source: NZIER

Table 3 EDB cost allocators for community-owned EDB

Cost is allocated using customer group share of the allocator listed

EDB	Peak demand ¹	Installed Capacity	Energy supplied	ICP number	Line length (high and low voltage)
WEL Networks	Operating, capital and transmission costs.		Other pass-through ² costs.		
Northpower	Transmission, zone substation, sub-transmission line/cable costs.				High and Low voltage line/cable, transformer, switchgear costs. (Almost all allocated to mass market).
Electra	Direct operating, capital and transmission costs.		Indirect costs - (50 percent weight).	Indirect costs - (50 percent weight).	
Counties Power	Transmission, zone substation, sub-transmission line/cable and 11kV network costs. Low voltage cables, lines and plant - (50 percent weight).		Volume overhead	Customer overhead Low voltage cables, lines - (50 percent weight).	
Main Power ³			Direct operating, capital and transmission costs? Administrative and overhead costs.		
The Power Company	Transmission and sub-transmission. Supply costs- (30 percent). Maintenance- (50 percent)	Supply costs- (70 percent).	Maintenance- (50 percent).	Overhead	

Notes:

1. EDB use several measures of peak demand (coincident, anytime maximum, after diversity maximum and winter and summer) to reflect the pressures on network capacity caused by different customer groups.
2. Other pass-through costs are usually limited to Electricity Authority and Commerce Commission levies but sometimes also include local body rates
3. The description of the cost allocators for Main Power network assets and transmission costs is unclear. The description refers to using asset registers to attribute asset costs to pricing regions but also refers to using energy supplied (consumption) as the basis for allocating the cost to prices.

Source: NZIER