

Variable charges under the low fixed charge Regulations

Guidelines

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1. Introduction

- 1.1 The Electricity (Low Fixed Charge Tariff Option for Domestic Consumers) Regulations 2004 (Regulations) require distributors and retailers to make available to residential consumers a pricing option with low fixed charges, limited to 15c/day for distributors and 30c/day for retailers.¹ The Regulations also require that the ‘average consumer’ must not be worse off on the low fixed charge tariff option,² and prohibit the use of tiered or stepped variable charges in low fixed charge tariff options.
- 1.2 The Ministry of Business, Innovation and Employment (MBIE) is responsible for administering and amending the Regulations.³ The Electricity Authority (Authority) is responsible for enforcing the Regulations.
- 1.3 Some distributors and retailers have expressed the need for more clarity about the requirements of the Regulations with respect to demand and capacity charges (in particular, whether these should be considered to be fixed or variable charges for the purposes of the Regulations).
- 1.4 These Guidelines set out the Authority’s view on the requirements of the Regulations with respect to distributors’ and retailers’ demand and capacity charges. The Authority will enforce the Regulations in line with the views of the Regulations’ requirements set out in these Guidelines.
- 1.5 These Guidelines are intended to reduce uncertainty regarding the requirements of the Regulations with respect to demand and capacity charges. The Authority also intends the Guidelines to assist distributors and retailers to demonstrate compliance with the Regulations when they use demand or capacity charges.
- 1.6 These Guidelines are not intended to be definitive or exhaustive in relation to the Regulations, and should not be used in place of legal advice.

¹ That is, 15c/day excluding GST and 30c/day excluding GST.

² In these Guidelines, ‘average consumer’ means the average consumer for the purposes of assessing compliance with the crossover requirement in the Regulations (discussed further in section 3 of these Guidelines).

³ The Authority may not implement market facilitation measures or make amendments to the Electricity Industry Participation Code 2010 that override the Regulations.

2. What is a variable charge?

2.1 The Authority considers that, for the purposes of the Regulations, 'variable charge' includes charges that are based on a consumer's:

- (a) consumption over time (consumption charges)
- (b) instantaneous demand (demand charges)
- (c) capacity to consume (capacity charges).

Definitions

2.2 Fixed and variable charges are defined terms in the Regulations. Under regulation 4(1):

- (a) a '**variable charge**' is a charge that varies according to the amount of electricity consumed (for example, cents per kilowatt hour)
- (b) a '**fixed charge**' is a charge levied for each customer connection in currency per time period (for example, cents per day).

2.3 The definition of variable charge requires there to be a relationship between the charge and the electricity consumed. That is, variation in the amount of the charge is based on variation in the amount of electricity consumed.

2.4 The Regulations do not specify how to measure the amount of electricity consumed. 'Cents per kilowatt hour' is provided as one example, but it is not the only example.

Consumption charges

2.5 Consumption charges are based on the amount of electricity consumed over time. Consumption is measured in kilowatt hours (kWh). Consumption charges are measured in cents per kilowatt hour (c/kWh). The amount of the charge is found by multiplying the rate by the number of kWh consumed over a given period (eg, an hour, a month, a quarter or a year). The rate of the charge may be constant, or it may vary depending on the time of day (eg, different rates for consumption during peak, shoulder and off-peak periods). Consumption charges for which the rate varies depending on the time of day are known as time-of-use (ToU) charges.

2.6 A consumption charge varies according to the amount of electricity consumed during the period for which the charge applies. Consider two consumers, A and B, who are both subject to the same rates. If there is a difference in the amount of the consumption charge between Consumer A and Consumer B, this difference must be caused by a difference in the amount of electricity consumed by these two consumers during the relevant period. So a consumption charge is a variable charge.

Demand charges

- 2.7 Demand is the amount of electrical power used at a point in time. Electrical power or demand is measured in kilowatts (kW). Demand charges are measured in cents per kilowatt (c/kW). The amount of the charge is found by multiplying the rate by the number of kW used at the point in time targeted by the demand charge.
- 2.8 Generally, meters do not record demand directly. However, a smart meter can record the amount of electricity used at a consumer's premises during a given half-hour period. This reading can be used to derive the consumer's average demand during that half-hour period. For example, if 2.5 kWh of electricity was consumed at a consumer's premises between 7pm and 7:30pm, then the average demand during that half-hour period was 5 kW.
- 2.9 In practice, demand charges are determined using this derived demand figure. So demand charges are based on the amount of electricity consumed during an identified demand measurement period (or during several periods). The demand measurement period need not be a single half-hour period. A demand charge may be based on the average of the consumer's demand across a number (eg, six, 12, 100) of peak periods.⁴
- 2.10 The demand measurement period may be specified in different ways. For example, an annual demand charge might be determined on the basis of the amount of electricity consumed by the consumer during the half-hour period at which:
- (a) the consumer's demand reaches its annual peak
 - (b) aggregate demand on the distribution network reaches its annual peak
 - (c) aggregate demand across a particular circuit of the distribution network reaches its annual peak.
- 2.11 The measurement period for the demand charge may be determined after the fact (eg, after the time of the annual peak has been determined), or may be specified in advance based on expected demand. For example, under 'critical peak pricing', consumers are typically advised at least a day in advance of periods when the network is expected to come close to full capacity (based on forecast weather and network conditions) and a higher price applies.

⁴ A key distinction between ToU and demand charges is as follows. For ToU charges, typically all consumption is charged at a c/kWh rate (depending on time of use), and all consumption in the peak period is charged at the higher rate. For example, all consumption between 6pm and 8pm every day may be charged at the peak-time rate. For demand charges, typically only the consumption during a limited number of peak periods is used to determine the chargeable demand (in kW). For example, consumption between 6pm and 8pm on the day of the year the network experiences its highest demand (or the six highest demand days of the year) might be used to determine demand, in kW, for the purposes of the demand charge. The consumer is then charged at a c/kW rate based on that single kW value. Outside that peak period (or those six periods), consumption between 6pm and 8pm could be disregarded for the purposes of the demand charge.

2.12 In practice, a demand charge varies according to the amount of electricity consumed during the demand measurement period(s). If Consumer A's demand charge differs in amount to Consumer B's demand charge (on the same demand charge rate), this difference must be caused by a difference in the amount of electricity consumed by these two consumers during the time periods targeted by the demand charge. For example, consider an annual demand charge based on the annual network peak demand. If Consumer A paid more than Consumer B for that charge, it must be because the amount of electricity consumed by Consumer A during the period at which the network peak occurred was greater than the amount consumed by Consumer B. So a demand charge is a variable charge.

Capacity charges

2.13 A consumer's capacity can be defined as the upper limit on the amount of power that the consumer is able to use at a single point in time.⁵ Capacity is measured in kW. Capacity may be physical (ie, the physical capacity of the connection to the premises) or contractual (where a consumer contracts for a certain capacity to be available).

2.14 Effectively, a consumer's capacity is a specified maximum level of demand for that consumer. For a consumer who never needs to use a large amount of power at once, a low capacity would be sufficient. A consumer who wishes to be able to use a higher amount of power at a single point in time (eg, running multiple appliances at once) would select a higher annual capacity, sufficient to meet that consumer's annual peak demand. This selection might involve installing a larger physical connection or contracting to be placed into a higher capacity band.

2.15 A capacity charge is similar to a demand charge based on the consumer's own peak demand, except that the consumer has to select the capacity it will require in advance. A capacity charge varies according to that specified maximum level of demand. Capacity charges are measured in cents per kilowatt (c/kW). The amount of the charge is found by multiplying the rate by the number of kW that makes up consumer's capacity.

2.16 In practice, when a consumer selects a capacity for the year ahead (in the case of an annual capacity charge), they are likely to do so based on the amount of consumption they might reasonably expect to use during the time period at which that consumer's maximum demand will occur during the year. In thinking about this, the consumer might take into account the uncertainty about all the factors that can affect electricity use, and might allow a buffer in case of unexpected circumstances that could lead to particularly high use. So a capacity charge is based on the amount of electricity a consumer expects to consume during that period of maximum demand.

⁵ Capacity is the physical or contractual limit on the maximum possible demand.

2.17 It follows that a capacity charge will vary according to the amount of electricity a consumer expects to consume during that period of maximum demand. If there is a difference in the amount of the annual capacity charge between Consumer A and Consumer B (on the same capacity charge rate), this difference is likely to be caused by a difference in the amount of electricity these two consumers expect to consume during each consumer's period of maximum demand for the year ahead. If Consumer A pays more than Consumer B for the capacity charge, it must be because the amount of electricity that Consumer A expects to consume during his period of maximum demand for the year is greater than the amount that Consumer B expects to consume during her period of maximum demand.

2.18 A capacity charge that varies according to the amount of electricity a consumer expects to consume is a variable charge. So capacity charges are variable—provided the consumer can change its capacity at reasonable cost and in a reasonable time period, and so change the amount of the capacity charge that will apply. If in practice the consumer is unable to affect the amount of a capacity charge, then that charge would be considered to be a fixed charge.

Daily charges

2.19 A daily charge is based on the number of days for which a consumer is connected. Daily charges are measured in dollars and cents per day (ie, currency per time period). The amount of the charge is found by multiplying the rate by the number of days for which the consumer is connected.

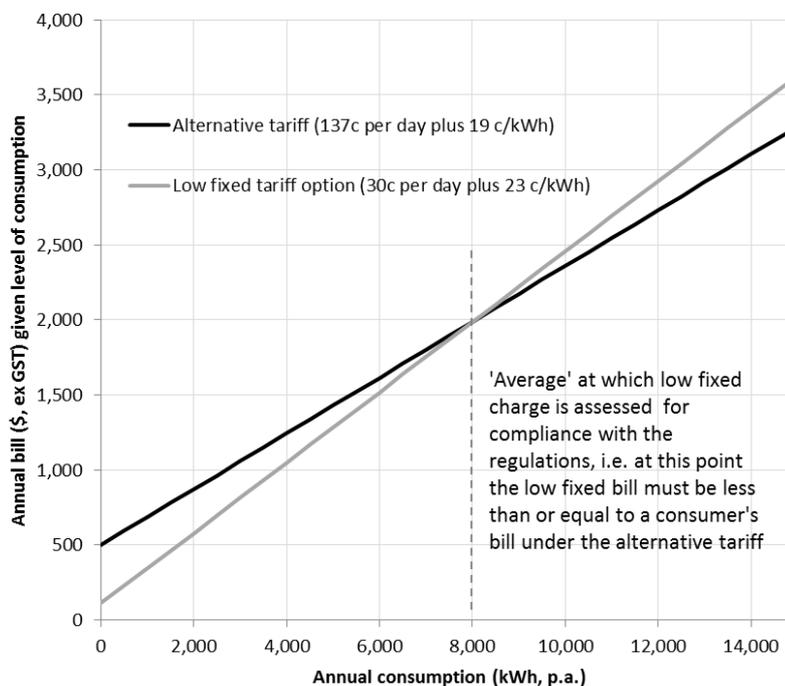
2.20 A daily charge does not vary according to the amount of electricity consumed (or the amount of electricity expected to be consumed). So a daily charge is not variable. On the basis that it is expressed in terms of currency per time period, a daily charge is a fixed charge. Similar reasoning would apply for charges expressed as monthly or annual charges.

3. Requirements for variable charges

Crossover requirement

- 3.1 The Regulations set a requirement that the average consumer must not be worse off on an LFC tariff than on any alternative tariff (called the “crossover requirement”). Under regulations 9(2) and 15(1), the variable charge must be such that the ‘average consumer’ on the LFC tariff pays no more in total per year than the average consumer would pay in total per year on any alternative tariff or alternative distributor tariff.
- 3.2 The average consumer is defined in regulation 4(1) of the Regulations as:
- (a) in relation to a consumer whose home is in the Lower South region, a person who purchases or uses 9,000 kWh of electricity per year in respect of that home; or
 - (b) in relation to a consumer whose home is elsewhere in New Zealand, a person who purchases or uses 8,000 kWh of electricity per year in respect of that home.
- 3.3 If a consumption charge is the only variable charge in use, this statutory definition can be applied directly in assessing compliance with the cross-over requirement. A crossover point between an LFC tariff and an alternative tariff for an average consumer on 8,000 kWh per year is illustrated in Figure 1.

Figure 1: Retail price structures with consumption charges (LFC tariff and alternative tariff)



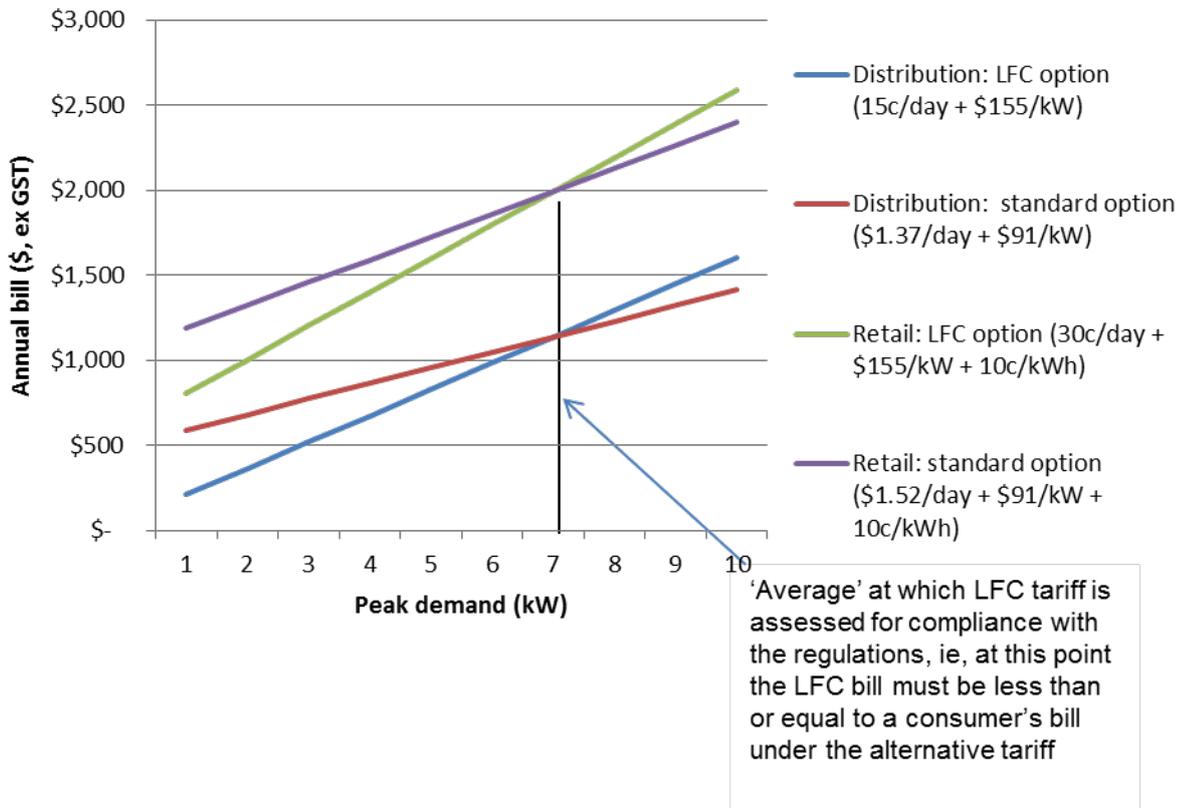
- 3.4 In Figure 1, consumption of 8,000 kWh is treated as the point at which to assess compliance with the crossover requirement. This is because the

tariffs in the example are assumed to be for a network area located in some region of New Zealand other than the Lower South region, and the Regulations require the crossover point to be assessed at 8,000 kWh for such a network area.

- 3.5 Although the Regulations use the phrase ‘average consumer’ to describe the level of consumption at which to assess compliance with the crossover requirement, this is just a convenient label. The ‘average consumer’ level of consumption defined in the Regulations almost certainly differs from the real-world average level of consumption.
- 3.6 In these Guidelines, we use ‘average consumer’ as a convenient short-hand to describe the point at which to assess compliance with the crossover requirement in the Regulations.
- 3.7 If some type of variable charge other than a consumption charge is employed (such as demand or capacity charges), it is necessary to determine the level of demand or capacity at which to assess compliance with the crossover requirement. Equivalently, it is necessary to determine the demand or capacity of the ‘average consumer’. The Regulations allow some flexibility in how to do this. The average consumer’s peak demand or capacity can be modelled based on the demand or capacity of a range of residential consumers with annual consumption of approximately 9,000 kWh in the Lower South region and 8,000 kWh elsewhere in New Zealand.
- 3.8 For example, a distributor (assumed to be located in some region other than the Lower South region) might use a formula to estimate the average peak demand of the average consumer. If there are few (or no) consumers on the distribution network who consume exactly 8,000 kWh, it might use a range of residential consumers with annual consumption between 7,000 and 9,000 kWh to construct the average consumer’s kW demand. The distributor could then use the average consumer’s kW demand to ensure its LFC tariff complies with the crossover requirement under regulation 15(1).
- 3.9 Figure 2 illustrates how the crossover requirement could work at the distribution and retail levels for tariffs that employ demand charges. It is assumed the average consumer has a peak demand of 7 kW (and consumption of 8,000 kWh), so the crossover between the LFC tariff and standard tariff occur at 7 kW.⁶ The retailer is assumed to pass through the distributor’s demand charge to consumers, and add a consumption charge to cover energy costs. Tariffs employing capacity charges could work similarly.

⁶ In Figure 2 we have assumed that consumption correlates with demand (so for example, consumers with 8 kW demand have a higher level of consumption than consumers with 7 kW demand). This will not necessarily be the case in practice.

Figure 2: Distribution and retail price structures with demand charges



Prohibition on tiered or stepped variable charges

- 3.10 Under regulations 10(2)(a) and 16(1)(a), an LFC tariff must not contain a variable charge that is tiered or stepped according to the amount of electricity consumed.⁷
- 3.11 For consumption charges, this means that the c/kWh rate must not differ depending on the volume of electricity consumed. For example, charging 20c/kWh for the first 2,000 kWh of consumption and 10c/kWh thereafter is not allowed.
- 3.12 For demand or capacity charges, this means that the \$/kW rate must not differ depending on the level of demand or capacity. For example, charging \$300/kW for the first 2 kW of the peak demand level (or capacity required) and \$200/kW thereafter is not allowed.
- 3.13 However, under regulation 16(2)(b), a distributor may set rebates or discounts that vary according to the amount of electricity consumed, provided the rebates or discounts are consistent between the distributor’s LFC tariff and the distributor’s alternative tariff.

⁷ Under regulations 10(3) and 16(2)(a) of the Regulations, a retailer or distributor may set different variable charges for controlled and uncontrolled load, or for electricity consumption at different times of the day or year, provided that the different variable charges are not tiered or stepped according to the amount of electricity consumed.

- 3.14 For the average consumer who contracts for the average consumer's amount of capacity, a distributor could incentivise the consumer to stay within the contracted capacity by making the amount of the discount or rebate the consumer receives dependent on the consumer staying within the contracted capacity. Under such an arrangement, the average consumer that exceeded the contracted capacity would receive a smaller discount or rebate for the relevant billing period.

4. Examples of compliant price structures

4.1 Table 1 provides an example of price structures that comply with the Regulations. The kinds of charges shown here include charges based on:

- (a) capacity (in kilowatts, kW)
- (b) demand during a peak period (in kilowatts, kW)
- (c) consumption charges on and off peak (in kilowatt-hours, kWh)
- (d) daily fixed charges (in cents per day per connection).

Table 1: Examples of price structures that comply with the Regulations

Consumer in Lower South Island on a Low Fixed Charge retail tariff					
Tariff component	Consumer demand quantities	Two part tariff with ToU consumption charge	Tariff with demand charge	Tariff with capacity charge	Tariff with capacity and demand charges
Capacity	10.0 kW	--	--	10 \$/kW	10 \$/kW
Demand at peak ⁸	1.71 kW	--	475 \$/kW	--	200 \$/kW
Consumption, off peak	1,293 kWh	23 c/kWh	13 c/kWh	22 c/kWh	18 c/kWh
Consumption, at peak ⁹	5,251 kWh	29 c/kWh	16 c/kWh	27 c/kWh	22 c/kWh
Daily charge	365 days	34.5 c/day	34.5 c/day	34.5 c/day	34.5 c/day
Average annual consumption		6,544 kWh	6,544 kWh	6,544 kWh	6,544 kWh
Annual bill		\$1,949	\$1,949	\$1,949	\$1,949
Annual bill @ 9,000 kWh		\$2,633	\$2,633	\$2,596	\$2,596
Consumer in Lower South Island on a standard retail tariff					
Tariff component	Consumer demand quantities	Two part tariff with ToU consumption charge	Tariff with demand charge	Tariff with capacity charge	Tariff with capacity and demand charges
Capacity	10.0 kW	--	--	11 \$/kW	10 \$/kW
Demand at peak	2.66 kW	--	828 \$/kW	--	19 \$/kW
Consumption, off peak	2,008 kWh	17 c/kWh	0 c/kWh	20 c/kWh	19 c/kWh
Consumption, at peak	8,155 kWh	23 c/kWh	0 c/kWh	26 c/kWh	26 c/kWh
Daily charge	365 days	186.9 c/day	186.9 c/day	67.2 c/day	69.6 c/day
Average annual consumption		10,163 kWh	10,163 kWh	10,163 kWh	10,163 kWh
Annual bill		\$2,885	\$2,885	\$2,885	\$2,885
Annual bill @ 9,000 kWh		\$2,633	\$2,633	\$2,596	\$2,596

⁸ Demand at peak is assumed to be at a higher level for a household consuming 9,000 kWh/year than for a household consuming 6,544 kWh/year.

⁹ The examples in Table 1 assume no behavioural responses by consumers (eg reducing peak consumption or demand in response to a price signal).

- 4.2 The price structures outlined in Table 1 are indicative, but are based on estimated average consumption by residential consumers on a network on LFC tariffs and standard tariffs.
- 4.3 The “Annual bill @ 9,000 kWh” figures are reported for comparison and to demonstrate compliance with the Regulations.¹⁰

¹⁰ At this level of consumption (9,000 kWh), under the Regulations, a residential consumer’s bill in the Lower South region (as defined in the regulation 4(1) of the Regulations) for the LFC tariff must be the same or lower than what they would be on the standard tariff (referred to as the alternative tariff option in the Regulations).