Attachment 17: Proposed Tariff Structure Statement

Regulatory proposal for the ACT electricity distribution network 2019–24
January 2018

evoenergy

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1. Introduction

Evoenergy owns and operates the electricity network in the Australian Capital Territory (ACT), and gas networks in the ACT and surrounding areas in New South Wales (NSW). Within the ACT, Evoenergy operates and maintains a network of poles, wires, transformers and other equipment to distribute electricity safely and reliably to consumers. The Evoenergy network is an essential part in the process of moving electricity from where it is generated to where it is used by consumers.

This Tariff Structure Statement (TSS) provides Evoenergy consumers, and other stakeholders, with clear and accessible information about proposed reforms to Evoenergy's current network tariffs. Appendix 17.1 contains a more detailed explanation of this Proposed TSS. The National Electricity Rules (Rules)[1] require network businesses such as Evoenergy to develop a TSS that clearly shows how the pricing principles have been applied to develop price structures and indicative price levels, typically for a five-year regulatory period.[2]

This is Evoenergy's second TSS. Once approved by the AER, the TSS will remain in place for the entire regulatory period (that is, from 1 July 2019 until 30 June 2024), unless an event occurs that is beyond the reasonable control of the distribution business and could not reasonably have been foreseen, and the AER approves a change. This second TSS continues to transition Evoenergy's network tariff structure along the cost-reflective spectrum. In preparation for this TSS, Evoenergy took into account recent changes in electricity markets and a comprehensive review of its network costs and existing tariff structures, and consulted widely with the ACT community, large consumers and retailers.

The tariff structures contained in the approved TSS will form the basis of Evoenergy's annual pricing proposals for the financial years 2019/20 to 2023/24. The AER will conduct an approval process for annual prices to check consistency with the TSS, compliance with pricing principles, and other requirements such as the control mechanism under the AER's distribution determination.

1.1 Background

1.1.1 History of tariff changes

Evoenergy has been introducing cost-reflective tariffs over the last 10 years. The next phase of this journey focuses on implementing a more cost-reflective tariff structure and changing tariff levels over time. In the first TSS, Evoenergy reformed the existing network tariff structure to include more cost-reflective tariffs. A summary of the approved changes resulting from the first TSS are listed below.

- **Residential consumers—**A new peak period demand tariff was introduced from 1 December 2017 for residential consumers whose premises are fitted with interval meters that can be read remotely. This start date aligned with the timeframe for

[1] Clause 6.18.1.

[2] The Rule changes put in place transitional provisions for the initial TSS to be effective for the last two years (2017/18 and 2018/19) of the current regulatory control period (2014/15 to 2018/19). This second TSS is being developed for the next five-year regulatory period 2019–24.

metering contestability. For consumers without remotely read metering technology, Evoenergy improved the alignment of their tariff levels to the estimates of long-run marginal cost of supply.

- **Low voltage commercial consumers—**A new peak period demand tariff for commercial LV consumers was introduced from 1 December 2017, while continuing to offer existing cost-reflective tariffs for consumers in this tariff class.
- **High voltage commercial consumers—**Given that HV commercial consumers already have a highly cost-reflective network tariff structure, Evoenergy maintained the existing tariff structure for commercial HV commercial consumers and consolidated the number of tariffs from four to three.

In October 2010, time-of-use (TOU) tariffs became the default tariff for all new residential and commercial premises, but consumers could opt out of TOU charging by selecting an alternative tariff. Around 25,000 residential consumers are now on the Residential TOU tariff,[3] which represents 18 per cent of all residential consumers. Also, more than 4,000 commercial consumers have moved to the General TOU or the LV commercial demand tariffs,[4] representing approximately 27 per cent of all LV commercial consumers.

1.1.2 Regulatory background

As with all electricity distribution network service providers in the National Electricity Market, Evoenergy is a regulated business. As such, Evoenergy complies with the Rules and the National Electricity Law. The AEMC is responsible for setting the Rules. The AER monitors and enforces compliance with these regulatory requirements.

As stated, once approved, this TSS will remain in place from 1 July 2019 to 30 June 2024. The tariff structures contained in the approved TSS will form the basis for Evoenergy's annual pricing proposals submitted to the regulator for the financial years 2019/20 to 2023/24. As part of this TSS proposal, Evoenergy cannot increase the revenue it is allowed to recover which is already set by the AER.

The Independent Competition and Regulatory Commission (ICRC) regulates ActewAGL Retail's standing offer electricity prices for small customers in the ACT. AAR is subject to price regulation by the ICRC for the current three year period (2017/18 – 2019/20) which covers this TSS reform period.

1.1.3 National and jurisdictional context

The development of Evoenergy's second TSS has taken place in the midst of a number of changes to the national and jurisdictional regulatory environment. A summary of these changes and jurisdictional specific context is outlined below.

- **Roll out of smart meters in the ACT:** In accordance with the Metering Rule Change,[5] smart meters became the standard electricity meter in the ACT for all new connections and for all meter replacements from 1 December 2017. Smart meters record customers' real-time electricity usage data.
- **Solar panels, batteries and other distributed energy resources:** The proliferation of emerging technologies is changing the way consumers source and

[3] ActewAGL Distribution, ActewAGL Distribution 2017/18 Annual Pricing Proposal, p. 20.

[4] ActewAGL Distribution, ActewAGL Distribution 2017/18 Annual Pricing Proposal, p. 21.

[5] AEMC, National Electricity Amendment (Expanding competition in metering and related services) Rule 2015, 26 November 2015.

use electricity. According to the Clean Energy Regulator, at November 2017 in the ACT, there were around 19,000 small generation solar units, around 11,000 solar water heater and air source heat pump, and 260 solar photovoltaic (PV) systems with concurrent battery storage capacity.[6] Solar PV up-take in the ACT is expected to rise owing to falling installation costs, continued government incentives, forecast increases in retail electricity prices, and requirements in new residential subdivisions. The Australian Energy Market Operator (AEMO) also notes that as capital costs decline in the medium term, together with the introduction of cost-reflective tariff structures, more residential battery storage is expected to become viable.

- **ACT Government utilities concession and other assistance to low-income households:** On 1 July 2017, the ACT government merged the Energy and Utility Concession and the Water and Sewerage Rebate into a single Utilities Concession. The maximum annual rebate for 2017–18 is $604 per household.
- **The ACT Government's 100 per cent renewable energy target:** In 2016, the ACT Government legislated a target of sourcing 100 per cent renewable electricity by 2020 from within the ACT or across the National Electricity Market. To assist this policy, the ACT Government provides feed-in tariffs (FiT) to encourage investment in the generation of renewable energy. Evoenergy pays the generator the difference between their FiT price for each megawatt hour (MWh) of renewable electricity generated and the value of that MWh in the wholesale electricity market.
- **Other ACT legislation:** Existing legislation made by the ACT Government sets out certain requirements for the recovery of particular levies and fees through network prices. This includes, and is not limited to, Energy Industry Levy,[7] Utilities Network Facilities Tax,[8] Feed-in Tariff (Large-scale)[9] and Feed-in Tariffs.[10]
- **Demand management actions:** In addition to cost-reflective network tariffs, Evoenergy has recently undertaken initiatives to reduce peak demand on its network. These initiatives include the following examples. Further information about Evoenergy's demand management programs can be found here: https://www.evoenergy.com.au/emerging-technology/demand-management
  - Trial of SMS curtailment requests: In 2017 Evoenergy undertook a two-month investigative project to determine the acceptance and effectiveness of sending direct messages to customers via SMS to request short-term load curtailment over designated times. Around six per cent of the study population responded to the SMS requests demonstrating moderate acceptance of the curtailment request, and that customers had curtailed load in some way in response to the request.
  - Virtual power plant: In November 2017, Evoenergy successfully trialled the coordinated deployment of residential battery stored power for network support. The trial demonstrated the potential for a much larger deployment of residential battery-stored power to change the way the network operates and defer or potentially avoid network augmentation.

[6] http://www.cleanenergyregulator.gov.au/RET/Forms-and-resources/Postcode-data-for-small-scale-installations#Summary-of-postcode-data.

[7] *Utilities (Energy Industry Levy) Amendment Bill 2007* (ACT).

[8] *The Utilities (Network Facilities Tax) Bill 2006* (ACT).

[9] *Electricity Feed-in (Large-scale Renewable Energy Generation) Bill 2011* (ACT).

[10] Electricity Feed-in (Renewable Energy Premium) Act 2008.

- Demand reduction contracts: Evoenergy is trialling contracts for demand reduction with a number of large commercial customers. Under these contracts, customers are encouraged to curtail their load from the network at designated times of network constraint. If implemented and operated correctly, these contracts have the potential to reduce overall network costs through deferral of augmentations.

- **Retail response to cost-reflective tariff reform:** In the ACT, there are three active retailers—ActewAGL Retail, Origin Energy and EnergyAustralia. At the time of this submission, ActewAGL Retail has adopted the same structure as the recently introduced network demand tariffs for residential and LV commercial customers.

1.2 Compliance with Rule requirements

Table 1.1 demonstrates compliance with the TSS Rule requirements. Evoenergy's TSS contains the sections referenced to address Rule 6.18.

Table 1.1 Compliance with the TSS Rule requirements

Requirement	Rule Reference	Reference in TSS
The TSS must include **tariff classes**	6.18.1A(a)(1)	Section 2.1
The TSS must include the policies and procedures for **assigning consumers to tariffs and reassigning** from one to another	6.18.1A(a)(2)	Sections 2.3.3 and 2.4.3
The TSS must include the **structures** for each tariff	6.18.1A(a)(3)	Sections 2.3.4 and 2.4.4
The TSS must include the **charging parameters** for each tariff	6.18.1A(a)(4)	Sections 2.3.4 and 2.4.4
The TSS must include a **description of the approach to be taken in setting each tariff** in each pricing proposal during the regulatory period	6.18.1A(a)(5)	Section 2 and Addendum 17.1
The TSS must be accompanied by an **indicative pricing schedule**	6.18.1A(e), 6.8.2(d1)	Appendix 17.3
TSS to be accompanied by an **Overview Paper**	6.8.2(c1a)	Overview Paper covering Regulatory Proposal including TSS is provided separately
A description of **engagement with consumers, retailers and stakeholders** in developing the TSS	6.8.2(c1a), 11.73.2	Section 5 of Appendix 17.1 and Overview Paper.

Requirement	Rule Reference	Reference in TSS
A description of how the **TSS complies with the pricing principles,** including supporting materials	6.8.2(c), 11.73.2	Section 2.7. Addendum 17.1 sets out how tariffs are based on LRMC. Addendum 17.2 describes how the revenue to be recovered from each tariff class lies between stand alone and avoidable costs.

2 Proposed tariff structure

The aim of Evoenergy's proposed tariff strategy is to continue to move its tariff structure further along the cost-reflectivity spectrum.[11] In this context, cost-reflective pricing is about ensuring that network electricity charges to consumers reflect the cost of providing electricity network services to the consumer (for both usage and capacity). Customer responsiveness to cost-reflective price signals is expected to lead to better use of the existing network and more efficient augmentation of the network. That is, as customers respond to cost-reflective price signals by shifting electricity usage from peak periods when the network faces its highest demand, the requirement for network investment can potentially be deferred. This deferral of network investment will contribute to a reduction of network prices for consumers in the future. The changes proposed to the tariff structure are designed to increase cost reflectivity and economic efficiency.

This section outlines Evoenergy's proposed tariff structure as follows.

- An explanation of proposed network tariff classes is provided in section 2.1.
- Contextual information regarding the proposed changes is provided in section 2.2.
- Details of the proposed tariff structure and charging parameters for tariffs offered to commercial and residential customers is provided in sections 2.3 and 2.4, respectively.
- Other changes related to the tariff structure are provided in section 2.5.
- A description of the way in which the tariffs comply with the pricing principles is provided in section 2.6.
- An explanation of how Evoenergy will update its tariffs annually is provided in section 2.7.

2.1 Proposed network tariff classes

Evoenergy's approach to the classification of network tariff classes remains unchanged from the classification approved by the AER for the 2014–19 regulatory control period.[12] Consumers are currently classified into three tariff classes:

- Residential;
- Low voltage (LV) commercial; and
- High voltage (HV) commercial.

In accordance with clause 6.18.1A(a) of the Rules, these are the classes into which retail consumers for direct control services will be classified during the 2019–24 regulatory control period.

The tariff classes are set on an economically efficient basis. Consumers within each tariff class have similar load and connection profiles, which mean they impose similar costs on the network. Thus, setting tariffs within tariff classes enables Evoenergy to distinguish

[11] This strategy is dependent on metering installations, customer impacts and retailers' response to cost-reflective network tariff reforms.

[12] AER, Final Decision, Tariff Structure Statement, ActewAGL, February 2017, p. 33.

those similar costs and apply charges to each tariff class appropriately, which results in an efficient outcome.

Consistent with clause 6.18.3(d), these tariff classes also enable Evoenergy to avoid unnecessary transaction costs by treating consumers with similar profiles in a similar way. These tariff classes have proven to provide the most cost-effective way of grouping consumers together to minimise administrative costs, compared to offering additional classes and re-assigning existing consumers to different classes.

2.2 Context to proposed tariff changes

To provide contextual background to the proposed tariff changes, this section explains the relevant changes that were made to the tariff structure in the first TSS (section 2.2.1) and the core concepts on which the proposed tariff changes for this second TSS are based (section 2.2.2).

2.2.1 Changes implemented in first TSS

In the first TSS, Evoenergy introduced a range of highly cost-reflective tariff reforms. A summary of the approved changes resulting from the first TSS are listed below.

- **Residential consumers—**A new peak period demand tariff was introduced from 1 December 2017 for residential consumers whose premises are fitted with interval meters that can be read remotely. This start date aligned with the timeframe for metering contestability. For consumers without remotely read metering technology, Evoenergy improved the alignment of their tariff levels to the estimates of long-run marginal cost of supply.
- **Low voltage commercial consumers—**A new peak period demand tariff for commercial LV consumers was introduced from 1 December 2017, while continuing to offer existing cost-reflective tariffs for consumers in this tariff class.
- **High voltage commercial consumers—**Given that HV commercial consumers already have a highly cost-reflective network tariff structure, Evoenergy maintained the existing tariff structure for commercial HV commercial consumers and consolidated the number of tariffs from four to three.

2.2.2 Core concepts for second Proposed TSS

In this second Proposed TSS, Evoenergy progresses its network tariff reforms based on three core concepts which have been used to form and validate the reforms, as explained below.

2.2.2.1 VALIDATION OF CHARGING WINDOWS

The proposed changes to tariff structures and levels are based on **residential and commercial load profiles** rather than the network load profile. Given that the ACT is a planned city, residential and commercial areas are, for the most part, deliberately separated. Table 2.1 below shows the percentage of feeder length servicing residential and commercial customers for each distribution zone station in the ACT, providing an indication of the types of customers located in each zone substation's servicing area. It shows that some of the zone substations service predominantly residential customers (i.e. Latham), others service predominantly commercial customers (i.e. Fyshwick), and some service a mix of residential and commercial customers (i.e. Civic). This information has been used to establish 'predominantly residential' and 'predominantly commercial' zone substation load profiles which are then used to analyse appropriate charging windows for residential and commercial customers, separately. Since residential and commercial customers are in some cases located in particular geographic areas, the application of peak prices based on specific estimates of LRMC for each tariff class to some extent includes a locational dimension to Evoenergy's tariff structure.

This approach of using predominantly residential and commercial load profiles is more cost reflective than using a network load profile which would be a weighted average of the residential and commercial load profiles. This analysis thereby provides a more accurate local profile on which to set charging windows, which ultimately leads to residential and commercial customers receiving sharper price signals that, on average, reflect the peaks that occur on the network in their area.

Table 2.1 Percentage of feeder length servicing residential and commercial customers by zone substation

	Residential	Commercial
Belconnen	69%	31%
City East	65%	35%
Civic	60%	40%
East Lake	18%	82%
Fyshwick	0%	100%
Gilmore	59%	41%
Gold Creek	83%	17%
Latham	100%	0%
Telopea Park	46%	54%
Theodore	99%	1%
Wanniassa	90%	10%
Woden	70%	30%

Source: Evoenergy's Electrical data manual

2.2.2.2 ROBUST CUSTOMER IMPACT ANALYSIS

The customer impact analysis of the proposed tariff reforms uses a **theoretical** approach to establish hypothetical customer impacts, as well as an approach based on **actual sample data** collected from customers, to add a realistic analysis of customer impacts (see sections 2.3.4 and 2.4.4).

The customer impacts based on actual data provides insights into the proportion of customers who are expected to be better off, worse off and indifferent to the proposed reforms. This analysis has been undertaken to provide greater understanding of the impact on customer network bills assuming the proposed tariff reforms are implemented and no behavioural changes to the prices. The load profile generated from the sample of actual customer level metering data was compared to and found to be consistent with load profiles generated from the predominantly residential and commercial zone substation data and aggregated residential and commercial data. (See sections 2.3.5 and 2.4.5).

2.2.2.3 VALIDATION OF COST-REFLECTIVE TARIFF REFORM

Evoenergy has undertaken extensive analysis (presented sections 2.3 and 2.4) to identify appropriate cost-reflective reforms to the network tariff structure. Subsequently, Evoenergy has compared the proposed tariff reforms to past industry research[13] which has been observed to align with Evoenergy's proposed approach. In this context, Evoenergy refers to industry research which identified an **optimal tariff structure** after extensive modelling based on Australian data, and taking into account the impacts of solar PV penetration and take-up of technologies such as air conditioners. The optimal tariff structure is a three-part tariff comprising:

- a fixed charge;
- TOU energy consumption charges; and
- a demand charge.

The research concluded that a demand tariff 'substantially increases the efficiency and fairness of the price signal'.[14] Further, the research argued that 'an optimal tariff structure can correct hidden subsidies and enhance the distributional equity and efficiency of distortionary costs'.[15] While the research was based on the experience of the southeast Queensland market, it notes that the implications of the research can be applied to other jurisdictions with similar characteristics. Given that Evoenergy's proposed cost-reflective tariff reforms for the 2019–24 regulatory control period transition the tariff structure towards this optimal tariff structure, the assessment provides further confirmation and validation for Evoenergy's proposal.

2.3 Proposed tariff structure for commercial customers

The majority of proposed network tariff reforms for the 2019–24 regulatory control period are related to the LV and HV commercial tariff classes. The following sections explain the proposed changes as follows:

- an outline of the proposed changes to Evoenergy's LV and HV commercial tariff structure (section 2.3.1);
- an explanation of the charging windows applied to LV and HV commercial tariffs (section 2.3.2);
- Evoenergy's LV and HV commercial customer assignment policy (section 2.3.3); and
- the indicative commercial customer impacts (section 2.3.4).

[13] Paul Simshauser 2014, 'Network tariffs: resolving rate instability and hidden subsidies'.

[14] Ibid, p. 1.

[15] Ibid, p. 26.

2.3.1 Proposed changes to commercial tariffs

A summary of Evoenergy's proposed changes to the LV commercial tariff structure is provided in Figure 2.1, followed by a summary of proposed changes to the HV commercial tariff structure in Figure 2.2.

Figure 2.1 Summary of proposed LV commercial tariff structure

Opt out

	Tariff Components						
	Fixed	Flat energy	Inclining Block energy	TOU energy	Anytime demand	Peak demand	Capacity
General Network*	✓		✓				
General TOU	✓			✓			
LV TOU kVA Demand	✓			✓	✓	✓	
LV TOU Capacity	✓			✓	✓	✓	✓
LV KW Demand	✓	✓		✓		✓	
Streetlighting	✓	✓					
Small unmetered	✓	✓					

* Obsolete to new customers from 1 December 2017

Note: Red ticks indicate proposed change in the 2019–24 regulatory control period

As shown in Figure 2.1, Evoenergy proposes three changes to the existing LV commercial tariff structure.

1. **LV KW Demand tariff:** replace the flat energy charge with a TOU energy charge.
2. **LV TOU kVA Demand tariff:** replace the anytime kVA maximum demand charge with a peak kVA maximum demand charge.
3. **LV TOU Capacity tariff:** replace the anytime kVA maximum demand charge with a peak kVA maximum demand charge.

Figure 2.2 Summary of proposed HV commercial tariff structure

	Tariff Components				
	Fixed	TOU energy	kVA anytime demand	kVA peak demand	kVA capacity
HV TOU Demand	✓	✓	✓	✓	✓
HV TOU Demand - Customer LV	✓	✓	✓	✓	✓
HV TOU Demand - Customer LV & HV	✓	✓	✓	✓	✓

Note: Red ticks indicate proposed change in the 2019–24 regulatory control period

As shown in Figure 2.2, Evoenergy proposes the following changes to the existing HV commercial tariff structure.

1. **HV TOU Demand tariff:** replace the anytime kVA maximum demand charge with a peak kVA maximum demand charge.

2. **HV TOU Demand – Customer LV tariff:** replace the anytime kVA maximum demand charge with a peak kVA maximum demand charge.
3. **HV TOU Demand – Customer HV and LV tariff:** replace the anytime kVA maximum demand charge with a peak kVA maximum demand charge.

The existing suite of commercial tariffs is already highly cost-reflective, with most tariffs including maximum demand and (in some cases) capacity charges. The proposed changes to the commercial tariffs have been designed with an emphasis on a customer's maximum demand during the peak charging window. This differs from the existing commercial tariffs[16] which base a customer's demand charge on their maximum demand at any time of the day. This change creates a greater incentive for large commercial consumers to actively manage their load to reduce their maximum demand during the peak charging window.

Most of the existing commercial demand tariffs have TOU energy charges in their structure. To align the structure of the LV kW Demand tariff with these tariffs and improve the cost reflectivity of this tariff, Evoenergy proposes to change the flat energy charge in this particular tariff, introduced on 1 December 2017, to a TOU energy charge. This means that consumers on the tariff will pay a bill that more closely reflects the long-term marginal cost of supplying electricity to them. It will also provide customers with greater opportunity to actively manage and control the distribution component of their electricity bills by considering when and how they use electricity.

Given the timing of the introduction of the LV kW Demand tariff (1 December 2017), there has not been sufficient time to analyse the impact of activating TOU energy charges at the commencement of the 2019–24 regulatory control period. Therefore, Evoenergy propose to set the peak, shoulder and off-peak TOU energy charges for the LV kW Demand tariff at the same rate initially.

Evoenergy proposes to establish a project to monitor and analyse customer demand and consumption data by season, day-of-week and time-of-day, to evaluate consumer response to the recently introduced LV kW Demand tariff. This approach will enable Evoenergy to set a cost-reflective tariff structure, while allowing sufficient time to analyse the consumption data across times of the day before setting TOU energy charges. It also allows retailers and Evoenergy to assist customers develop an understanding of demand tariffs through education and information. This approach is supported by research recently undertaken which found that it is important that industry and stakeholders understand 'consumers and their potential behavioural responses to new electricity pricing plans'.[17] The research also found:

> *Community organisations and stakeholders identified that consumers find it difficult to access and understand information about electricity pricing choices, making it hard for them to make informed and appropriate decisions. Given the complex and dynamic nature of the energy market, and evidence of a lack of consumer understanding about electricity pricing choices, it was recognised that education for consumers would be required.*[18]

Hence, the Indicative Pricing Schedule (Appendix 17.3) shows the proposed structure with the same charges set for each TOU energy charging window.

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[16] Excluding the LV kW Demand tariff.

[17] QUT and Citysmart *2017*, Taking advantage of electricity price signals in the digital age: Householders have their say, p. 21.

[18] Ibid, p. 9.

As explained in section 2.2.2.2, the proposed reforms to the network tariff structure are supported by industry research that defines an optimal tariff structure as a three-part tariff comprising a fixed charge, TOU energy consumption charges, and a demand charge. This structure corrects for cross subsidies and improves economic efficiency.[19] The proposed introduction of TOU energy charges for the LV kW Demand tariff (so that all commercial demand tariffs have TOU energy charges) and the transition to peak time maximum demand charges for all commercial demand tariffs is consistent with the research's optimal tariff structure, given the available technology.

Enhancing the cost reflectivity of these tariffs will mean consumers on these tariffs will pay a bill that more closely reflects the long-term marginal cost of supplying electricity to them. It will also provide customers with greater opportunity to actively manage and control the size of the distribution component of their electricity bills by considering when and how they use electricity.

The proposed changes to commercial tariffs mean that these 'commercial demand tariffs' (listed as 1–6 above) will comprise a fixed charge, a TOU consumption charge, a peak demand charge, and, in some cases, an anytime capacity charge. The structure of these commercial demand tariffs is shown in Figure 2.3 below.

Figure 2.3 Proposed commercial demand tariff structure

Fixed	Consumption	Demand	Capacity
• cents/day	• c/kWh • based on time of use	• c/kW/day(code 106) • c/kVA/day(codes 101, 103, 111, 121, 122) • based on consumer's maximum demand (1/2 hour), during a defined peak time period, in a calendar month	• c/kVA/day(codes 103, 111, 121, 122) • based on consumers' maximum demand (1/2 hour), during the previous 13 months

In line with current practice, the **fixed supply** component of these tariffs would not vary with the level of energy consumption or demand. The fixed charge relates to the connection services provided to consumers and ensures approved revenue requirements are met (i.e. return of and on the undepreciated portion of the sunk capital expenditure and fixed operating and maintenance costs associated with the existing asset base). The fixed charge signals the cost of maintaining connection assets as well as servicing consumers (e.g. consumer-related costs such as the network call centre).

Part of a consumer's bill would be based on **energy** consumption, with different rates applying at peak, shoulder and off-peak periods of the day.

Part of the consumer's bill would be based on the maximum **demand** that the consumer places on the network during the peak charging window. For the kVA demand and

[19] Paul Simshauser 2014, Network tariffs: resolving rate instability and hidden subsidies, p. 26.

capacity tariffs, this is a change from the current structure of the maximum demand charge which applies to any time of the day. Under the proposed tariff structures, the maximum demand is the highest average demand placed on the network during any of the 30-minute intervals that occur during the peak charging window. The demand charges are proposed to be applied to a set charging window as defined in the next section.

Changing the anytime maximum demand charge to a peak maximum demand charge means that commercial customers have greater incentive to reduce demand during times when the commercial load peaks. Applying a peak demand charge in conjunction with a peak consumption charge means that customers are sent a price signal to incentivise them to consider their usage during the entire peak charging window, rather than only a half hour window within that period.

Part of the bill for consumers on the LV TOU Capacity tariff or HV commercial tariffs is based on the maximum **capacity** that the consumer places on the network. This charge is currently applied on the same basis as the maximum demand charge (i.e. a consumer's maximum demand at any time), but is calculated based on the consumer's highest 30-minute peak demand over the previous 13 months inclusive of the current billing month. Evoenergy does not propose to make any change to this component of the tariffs.

Outside the peak charging window, the anytime capacity charge continues to provide an incentive for large commercial consumers to manage their load. For example, a restaurant (i.e. commercial customer) that peaks in the evening (i.e. outside the commercial peak charging window of 7 am to 5 pm) is encouraged to manage their load with the incentive of a capacity charge in place. Capacity tariffs are designed to encourage customers to flatten their loads.

Evoenergy considered introducing a critical peak tariff for HV commercial customers, and consulted with customers about this potential change. There were mixed views by HV commercial customers about the introduction of a critical peak tariff with most recognising that the impact would depend upon the individual financial circumstances and drivers for each customer. Evoenergy is not proposing to introduce a critical peak tariff in the 2019–24 regulatory control period because reductions in demand by HV commercial customers can be achieved, where necessary, by entering into tailored demand reduction contracts with individual HV commercial customers. This option is currently being trialled by Evoenergy, and is a feasible option given the relatively small number of HV commercial customers.[20]

There are no proposed changes to the General Network, General TOU, Streetlighting or small unmetered tariffs, as these tariffs are sufficiently cost reflective. The General Network and General TOU tariffs are as cost reflective as they can be given the metering functionality of customers on these tariffs. Small unmetered and streetlighting tariffs are sufficiently cost reflective given the cost associated with installing metering that would allow consumption to be more accurately recorded.

2.3.2 Charging window analysis

As discussed in section 2.2.2.1, one of the key concepts that forms the basis of Evoenergy's network tariff structure is the separate price signals sent to residential and commercial consumers. Given that many areas of the ACT are dominated by either residential or commercial loads that have distinctly different load profiles, separate price

[20] 26 customers in 2016/17.

signals are sent to residential and commercial customers via different charging windows. This means that commercial consumers located in predominantly commercial areas receive a price signal designed to address peak demand in predominantly commercial areas. The evaluation of the commercial charging windows that apply to TOU consumption and peak time maximum demand charges in the following tariffs are discussed in this section:

- General TOU Network;
- LV kW Demand Network;
- LV TOU kVA Demand Network;
- LV TOU Capacity Network;
- HV TOU Demand Network;
- HV TOU Demand Network – Customer LV; and
- HV TOU Demand Network – Customer HV and LV.

Evoenergy proposes to set the same peak, shoulder and off-peak charging windows for consumption and demand charges in each of the applicable commercial tariffs (see above). This alignment will make it easier for customers to understand the commercial tariff structure and assess the implications of moving from one commercial tariff option to another (subject to the assignment policy described in section 2.4.3).

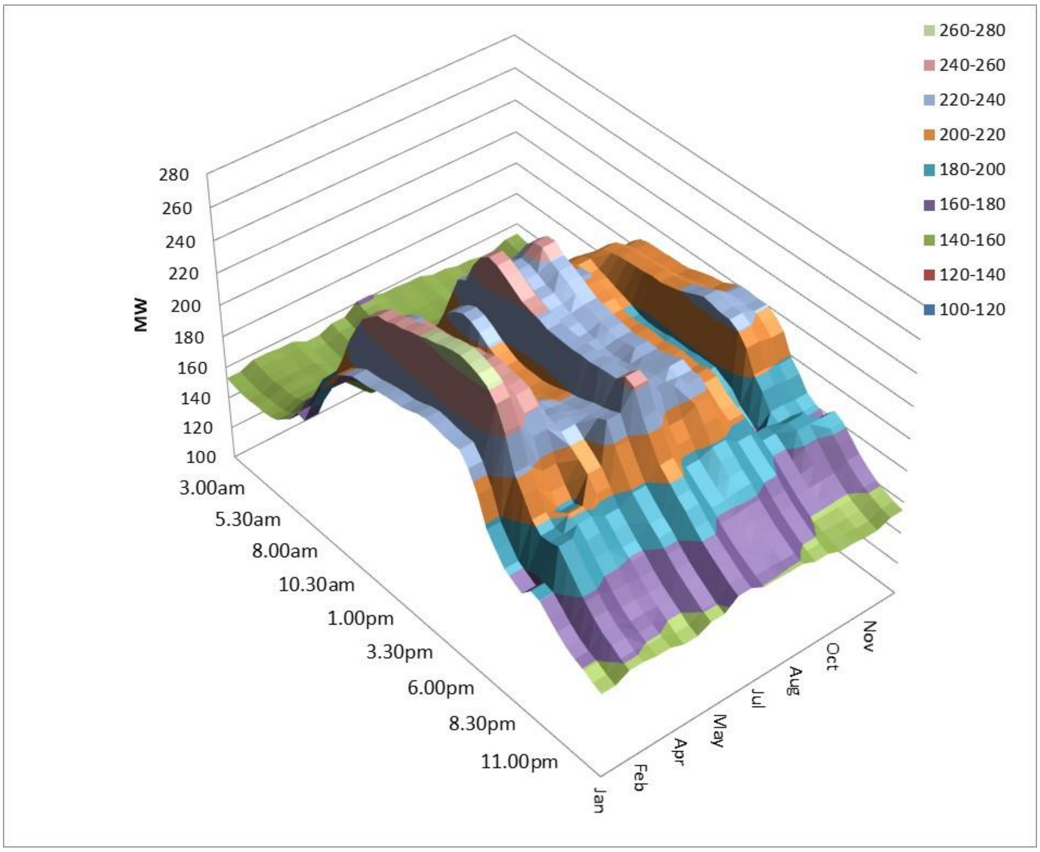
To define the charging windows for applicable commercial tariffs, it is important to align the peak charging window with times at which the electricity network peaks in predominantly commercial areas. To identify when the predominantly commercial areas of the network peak, Evoenergy has compiled load profiles for:

1. the total commercial load profile (shown in Figure 2.4);
2. predominantly commercial zone substations in the ACT (Figure 2.5);
3. a sample of commercial customers (Figure 2.6);[21] and
4. the total HV commercial load profile (shown in Figure 2.7).

A comparison of these profiles is undertaken to assess the appropriate charging windows for commercial consumers. (The load profile based on sample data is also used to validate the customer impact analysis undertaken in section 2.3.4).

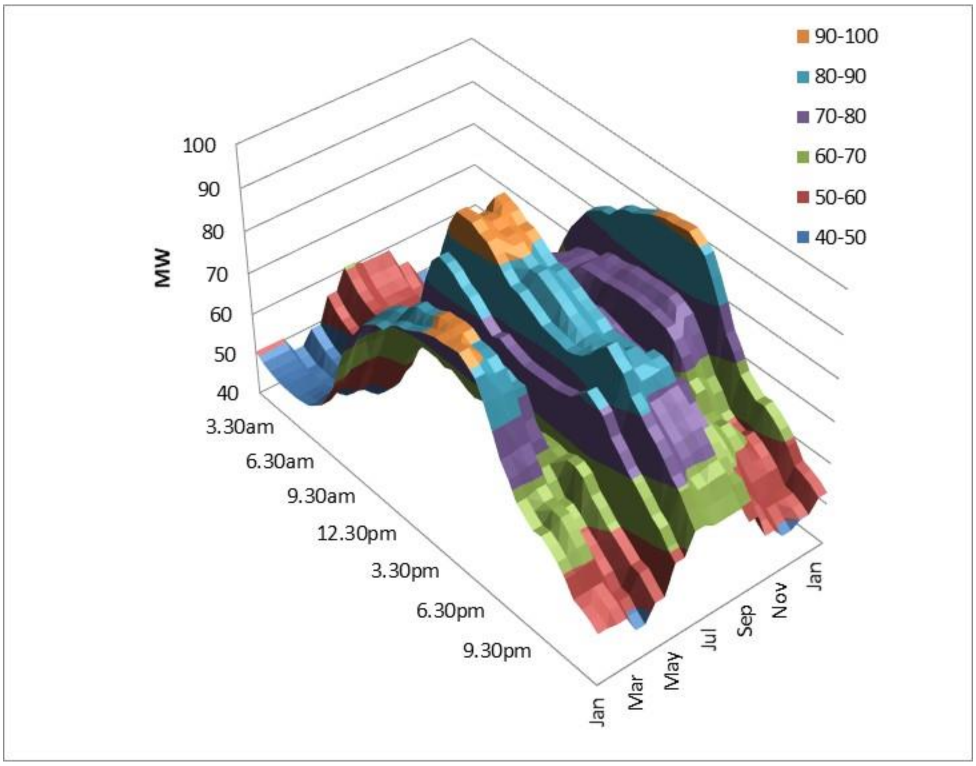
[21] Evoenergy has extracted a sample of LV commercial customer data to analyse customer impacts. This sample of data is used to generate a load profile (Figure 2.6) to test whether the sample is representative of the total LV commercial load profile.

Figure 2.4 For each month and for each half hour, the average daily total commercial load (MW), 2016



Source: Evoenergy

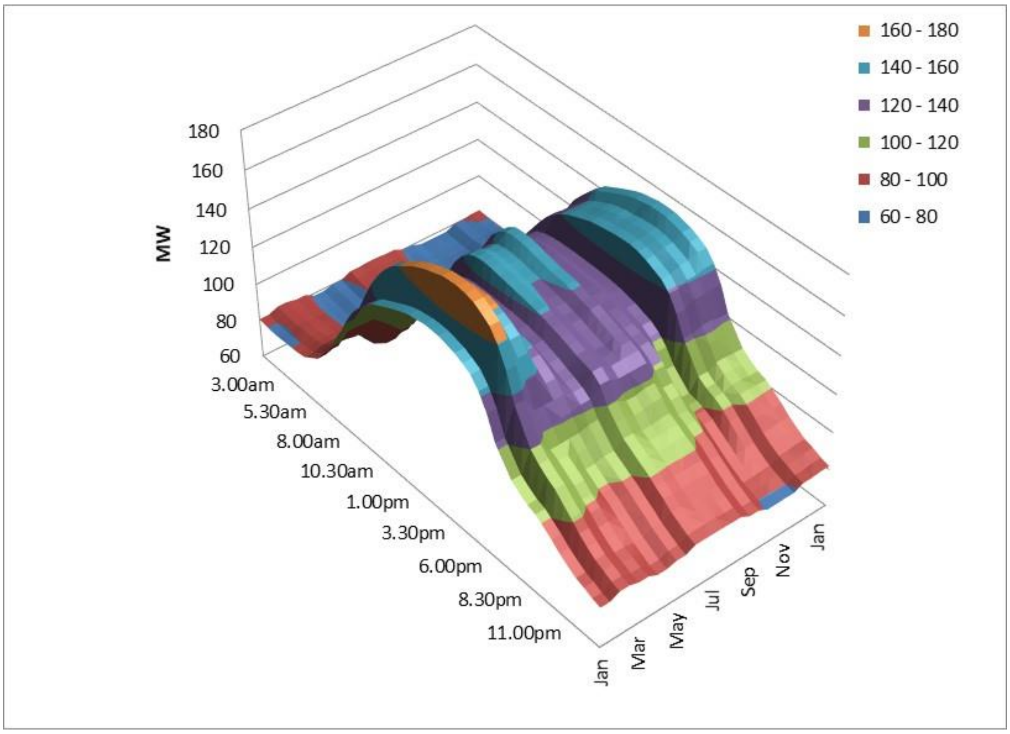
Figure 2.5 **For each month and for each half hour, the average daily total load (MW) on predominantly commercial zone substations, 2016**



Source: Evoenergy

Note: based on Eastlake, Fyshwick and Telopea Park zone substations

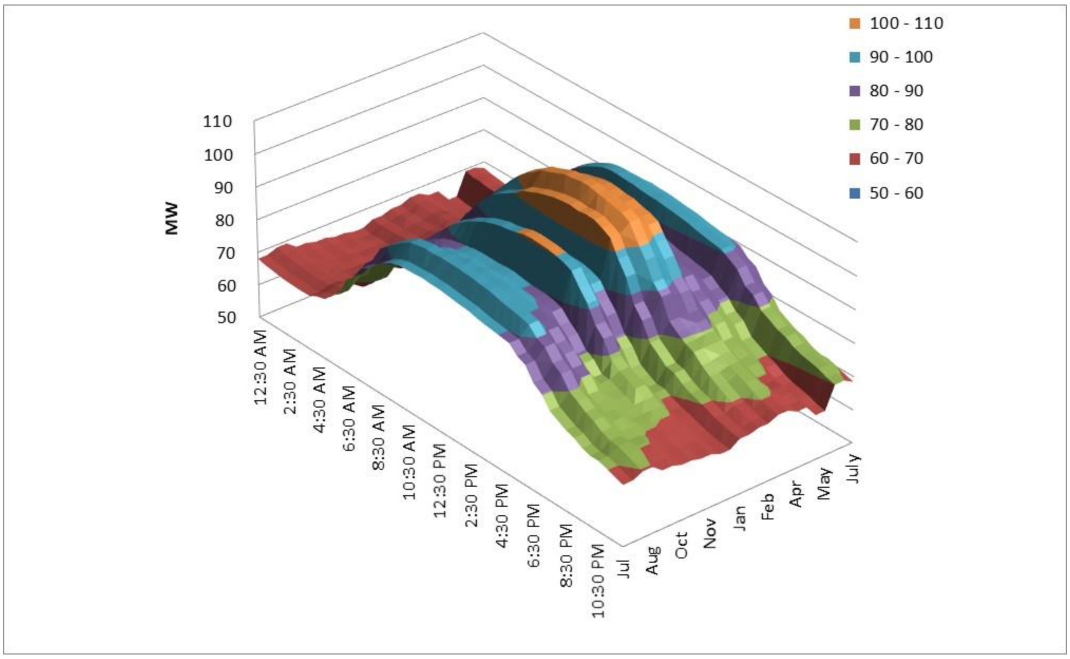
Figure 2.6 For each month and for each half hour, the average daily total load profile of a sample of LV commercial customers (MW), 2016



Source: Evoenergy

Note: customer in this sample had interval meters

Figure 2.7 For each month, the average daily energy consumption in each half hour of the HV commercial consumers, 2016



Source: Evoenergy

Given that the HV commercial load profile (Figure 2.7) is shown to be similar to the LV commercial load profiles (Figure 2.4 to Figure 2.6), it is reasonable to set the same charging window for LV and HV commercial consumers.

This analysis forms the basis for setting charging windows for commercial tariffs. Further detailed analysis of load profiles is provided below to provide further documentation that the commercial charging windows associated with the applicable commercial tariffs are appropriate.

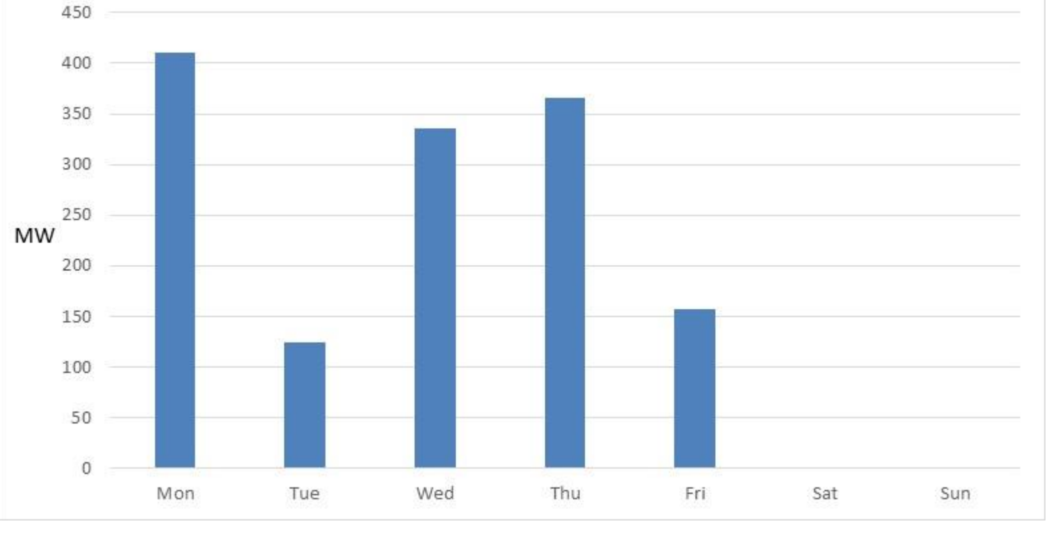
Time of Day

A comparison of the above load profiles consistently shows that the commercial load profile is highest between 7 am and 5 pm. This is because most commercial consumers operate their businesses during the day and the resulting activity by businesses is reflected in the high peaks occurring at that time of day.

Day of the Week

Evoenergy has also reviewed the days of the week at which peaks occur for commercial consumers. Using the data from predominantly commercial zone substations in the ACT, Evoenergy identified the days of the week on which the maximum demand occurred in each month of 2016. Figure 2.8 shows that at these zone substations, maximum demand occurred during weekdays, but not on weekends. This is because most commercial consumers operate their businesses on weekdays and the resulting activity is reflected in the peaks occurring during weekdays rather than weekends.

Figure 2.8 Maximum demand (MW) by day of the week at predominantly commercial zone substations, 2016



Source: Evoenergy

Seasonality

Figure 2.4 to Figure 2.7 also show that the commercial load is higher in both summer and winter months of the year, and lower during the autumn and springs months. This reflects the use of air conditioners for cooling in summer and electric heaters for heating in winter.

In the first TSS, the AER approved the introduction of the LV kW Demand tariff with seasonal demand charges set at the same level throughout the year. In that TSS, Evoenergy indicated that it may activate the seasonal demand charges in the following regulatory control period (2019–24). Similar to the proposed TOU energy charges for this demand tariff, Evoenergy proposes to delay the activation of seasonal demand charges until there has been sufficient time to analyse data on customer's response to the existing structure of the tariff (as per QUT research[22]).

Summary of charging window analysis

Based on the above analysis, the commercial load peaks:

- during the day, between 7 am and 5 pm;
- on weekdays; and
- is generally highest during summer and winter.

Hence, Evoenergy proposes to maintain its current peak charging window for the LV and HV commercial tariffs as the daytime (7 am to 5 pm) of each weekday, all year round. This peak charging window will apply to the tariffs and tariff components of the tariffs shown in Table 2.2.

Table 2.2 Peak charging window application

	Peak period consumption	Peak period maximum demand
General TOU Network	✓	
LV kW Demand Network	✓	✓
LV TOU kVA Demand Network	✓	✓
LV TOU Capacity Network	✓	✓
HV TOU Demand Network	✓	✓
HV TOU Demand Network – Customer LV	✓	✓
HV TOU Demand Network – Customer HV and LV	✓	✓

2.3.3 Proposed assignment policy for commercial customers

2.3.3.1 LV COMMERCIAL CUSTOMERS

In the 2019–24 regulatory period, Evoenergy proposes to retain the existing assignment policy. Specifically, customers with Type 4 meters will continue to be assigned by default to the LV kW demand tariff. These customers have the ability to opt out to the other cost-reflective tariffs, including General TOU, LV TOU kVA Demand and LV TOU kVA Capacity tariffs. This assignment policy emphasises placing LV commercial consumers on cost-reflective tariffs as soon as they have the necessary metering equipment

[22] QUT and Citysmart *2017*, Taking advantage of electricity price signals in the digital age: Householders have their say.

installed (i.e. Type 4 meters). This includes new premises and existing premises where the meter has been replaced. LV commercial consumers without Type 4 meters will remain on their existing tariff until their meter is replaced with a Type 4 meter. In the 2019–24 regulatory period, Evoenergy proposes to maintain this assignment policy.

2.3.3.2 HV COMMERCIAL CUSTOMERS

In the 2019–24 regulatory control period, the current assignment policy for HV commercial consumers is proposed to continue. Under this approach, all HV commercial tariffs will continue to be offered to these consumers on an opt-in basis.

2.3.4 Proposed commercial tariff structure Changes

Evoenergy's proposed commercial tariff structure, tariffs, eligibility and assignment of consumers to tariffs is summarised in Table 2.3. In summary, each of the tariffs has been reviewed to base the tariff on LRMC (as per Rule 6.18.5(f)) and the changes to the commercial tariff structure have been included.

Table 2.3 Evoenergy's proposed commercial tariff structure and eligibility criteria

Tariff class	Tariff	Consumer eligible to receive tariff	Component	Unit	Charging parameter
Commercial Low Voltage	General Network	Available to existing commercial low voltage consumers without Type 4 meters.	*Fixed network access charge* *Inclining block tariff energy consumption charge with 2 tiers*	*¢/day* *¢/kWh*	*Tier break is set at 330 kWh per day*
	General TOU Network	Available to all commercial low voltage consumers with a TOU meter.	*Fixed network access charge (per connection point)* *Energy consumption charge based on time of use*	*¢/day* *¢/kWh*	**Business Times:** 7 am – 5 pm every weekday **Evening Times:** 5 pm – 10 pm every weekday **Off-Peak Times:** All other times
	TOU kVA Demand Network	Available to all low voltage consumers with a TOU meter (except those consumers with an embedded generation system).	*Fixed network access charge (per connection point)* *Peak period demand charge* *Energy consumption charge based on time of use*	*¢/day* *¢/kVA/day* *¢/kWh*	*Maximum Demand charge applied to the maximum demand in the billing period* *Peak period for demand charge is 7am – 5pm Mon – Fri* *Energy charges:* **Business Times:** 7 am – 5 pm every weekday **Evening Times:** 5 pm – 10 pm every weekday ***Off-Peak Times:*** *All other times*
	TOU Capacity Network	Open to all low voltage consumers with a TOU meter. Prescribed for low voltage consumers with embedded generation.	*Fixed network access charge* *Peak period demand charge* *Capacity charge* *Energy consumption charge based on time of use*	*¢/day* *¢/kVA/day* *¢/kVA/day* *¢/kWh*	*Peak period for demand charge is 7am – 5pm Mon - Fri* *Capacity charge applied to the maximum demand in the previous 12 months* *Energy charges:* **Business Times:** 7 am – 5 pm every weekday **Evening Times:** 5 pm – 10 pm every weekday ***Off-Peak Times:*** *All other times*

Tariff class	Tariff	Consumer eligible to receive tariff	Component	Unit	Charging parameter
	LV kW Demand Network	Available to all commercial low voltage consumers with a Type 4 meter.	*Fixed network access charge* *Energy consumption charge based on time of use* *Peak period demand charge*	*¢/day* *¢/kWh* *¢/kW*	*Energy charges:* **Business Times:** 7 am – 5 pm every weekday **Evening Times:** 5 pm – 10 pm every weekday ***Off-Peak Times:*** *All other times* *Peak period for demand charge is 7am – 5pm Mon - Fri*
	Street Lighting Network	Applies to the night-time lighting of streets and public ways and places.	*Fixed network access charge* *Energy consumption charge*	*¢/day* *¢/kWh*	
	Small Unmetered Loads Network	Applies to eligible installations as determined by Evoenergy, including: telephone boxes, telecommunication devices.	*Fixed network access charge* *Energy consumption charge*	*¢/day* *¢/kWh*	
Commercial High Voltage	TOU Demand Network	Large consumers taking supply at high voltage with a low voltage network owned and maintained by Evoenergy.	*All three tariffs have the following components:* • *Fixed network access charge (per connection point)* • *Peak period demand charge* • *Capacity charge* • *Energy consumption charge based on time of use*	*$/day* *¢/kVA/day* *¢/kVA/day* *¢/kWh*	*Peak period for demand charge is 7 am – 5 pm Mon - Fri* *Capacity charge applied to the maximum demand in the previous 13 months inclusive of the current billing month.* *Energy charges:* **Business Times:** 7 am – 5 pm every weekday **Evening Times:** 5 pm – 10 pm every weekday **Off-Peak Times:** All other times
	TOU Demand Network – Consumer LV	Large consumers taking supply at high voltage where the consumer owns and is fully responsible for its own low voltage network.			
	TOU Demand Network – Consumer HV and LV	Large consumers taking supply at high voltage where the consumer owns and is fully responsible for their own low voltage network and where the consumer owns and is responsible for their high voltage assets.			

2.3.5 Indicative bill impacts for commercial customers

The indicative pricing schedule for commercial tariffs has been set such that the average commercial customer would:

- be better off on the LV kW Demand tariff than the General Network tariff;
- be indifferent or better off on the LV TOU kVA Demand and LV TOU Capacity tariffs from 1 July 2019 compared to before that date; and
- be indifferent or better off on the HV commercial tariffs from 1 July 2019 compared to before that date.

As already discussed, Evoenergy proposes to change the structure of the LV kW Demand tariff in the 2019–24 regulatory control period from a flat energy charge to a TOU-based consumption charge. However, Evoenergy proposes to maintain the same rate for the peak, shoulder and off-peak consumption charges in the 2019–24 regulatory control period. Due to this proposed approach, the indicative customer impacts based on the LV kW Demand tariff uses the same consumption rate for each of the TOU charges.

In this section, indicative commercial customer impacts are separately analysed using **theoretical** and **actual** customer demand and consumption profiles to determine how usage patterns affect network electricity bills. In the theoretical analysis, network electricity charges are calculated for a range of theoretical consumption profiles (from 2,000 to 11,000 kWh pa) and three load profiles that reflect the range of different maximum demands associated with commercial consumer load factors. The customer impacts based on actual customer data calculates network electricity bills for a representative sample of commercial consumers, to show the range of consumers who are expected to be better off, worse off and indifferent. All customer impacts are based on proposed network charges contained in the Indicative NUOS Pricing Schedule (Appendix 17.3)[23]. The theoretical and actual analyses are presented in sections 2.3.5.1 and 2.3.5.2, respectively.

2.3.5.1 THEORETICAL COMMERCIAL CUSTOMER IMPACTS

In this theoretical analysis, network electricity prices are calculated for a range of hypothetical consumption and demand profiles. The analysis is separated to compare customer impacts for:

- LV kW Demand, General TOU and General Network tariffs;
- LV TOU kVA Demand and LV TOU Capacity tariffs; and
- HV tariffs.

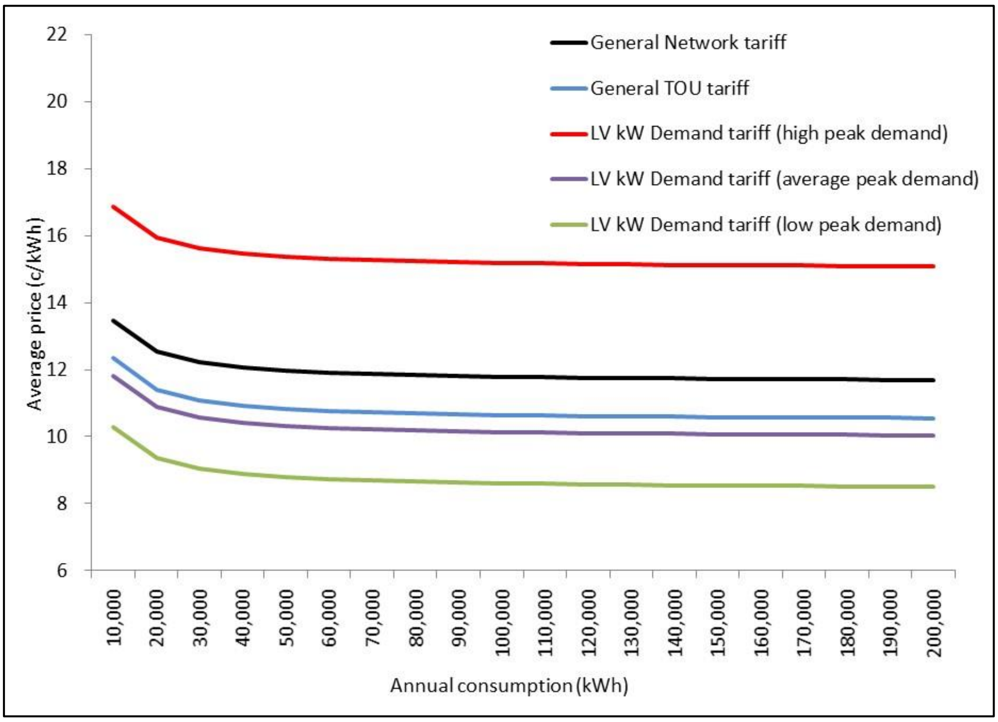
LV kW Demand, General TOU and General Network tariffs

A comparison of average network prices for LV commercial consumers on the LV kW Demand, General TOU and General Network tariffs is depicted in Figure 2.9. The hypothetical annual consumption is shown on the x-axis (kWh) and average price (total bill divided by energy consumption in c/kWh) is shown on the y-axis. Figure 2.9 shows the following for consumers on the LV kW Demand tariff.

[23] Evoenergy proposes to change the structure of the LV kW Demand tariff in the 2019–24 regulatory control period from a flat energy charge to a TOU-based consumption charge, but maintain the same rate for the peak, shoulder and off-peak consumption charges. Hence, the indicative customer impacts based on the LV kW Demand tariff uses the same energy charge for the peak, shoulder and off-peak charges.

- Consumers with an average peak demand are on average likely to receive a network bill slightly lower than what they could expect on the General Network or General TOU tariffs.
- Consumers with a low maximum demand (and therefore a high load factor) are on average likely to receive a lower network bill than they would on either the General Network or General TOU tariffs.
- Consumers with a high maximum demand (and therefore a low load factor) are likely to receive a higher network bill than they would on the General Network or General TOU tariffs.

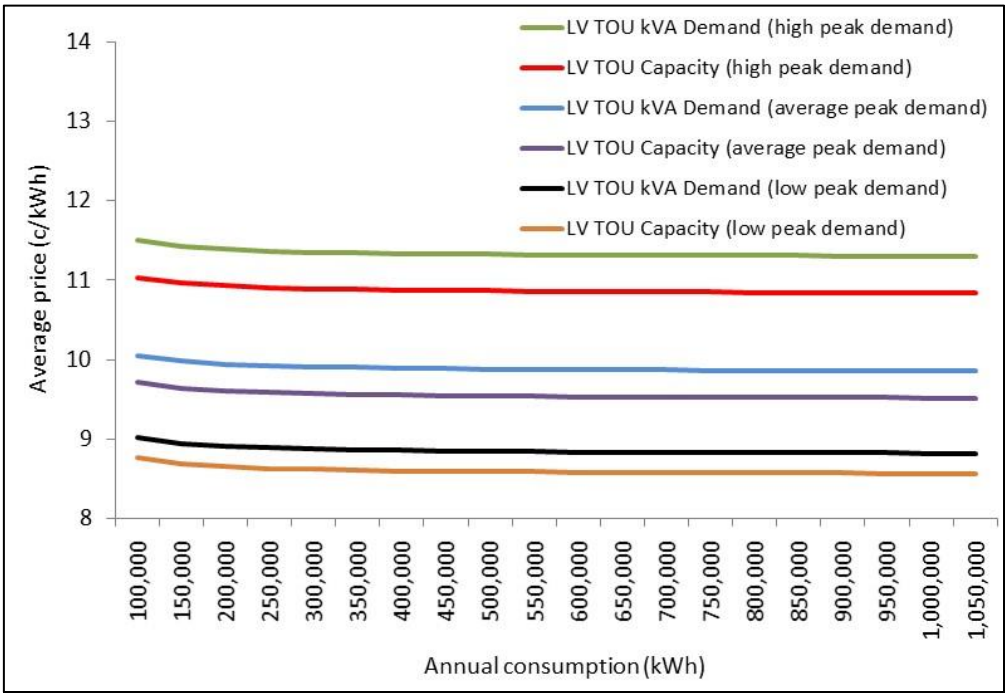
Figure 2.9 LV Commercial: price impacts for different consumption profiles (indicative 2019/20 tariffs)



LV TOU kVA Demand and LV TOU Capacity tariffs

A comparison of average network prices for LV commercial consumers on the LV TOU kVA Demand and LV TOU Capacity tariffs is depicted in Figure 2.10. Figure 2.10 shows that LV commercial consumers with a low peak demand (during the peak charging window) receive a lower bill because their demand charge is lower than consumers with average or high peak demand during the peak charging window.

Figure 2.10 LV TOU kVA Demand and LV TOU Capacity: price impacts for different consumption profiles (indicative 2019/20 tariffs)



HV commercial tariffs

A comparison of average network prices for each of the HV commercial tariffs is shown in Figure 2.11 to Figure 2.13 below. These Figures consistently show that consumers with a lower peak demand profile (represented by the green lines) receive a lower bill because their demand charge is lower than consumers with an average (orange lines) or high (blue lines) peak demand.

Figure 2.11 HV TOU Demand Network tariff (Code 111): price impacts by consumption profile (indicative 2019/20 tariffs)

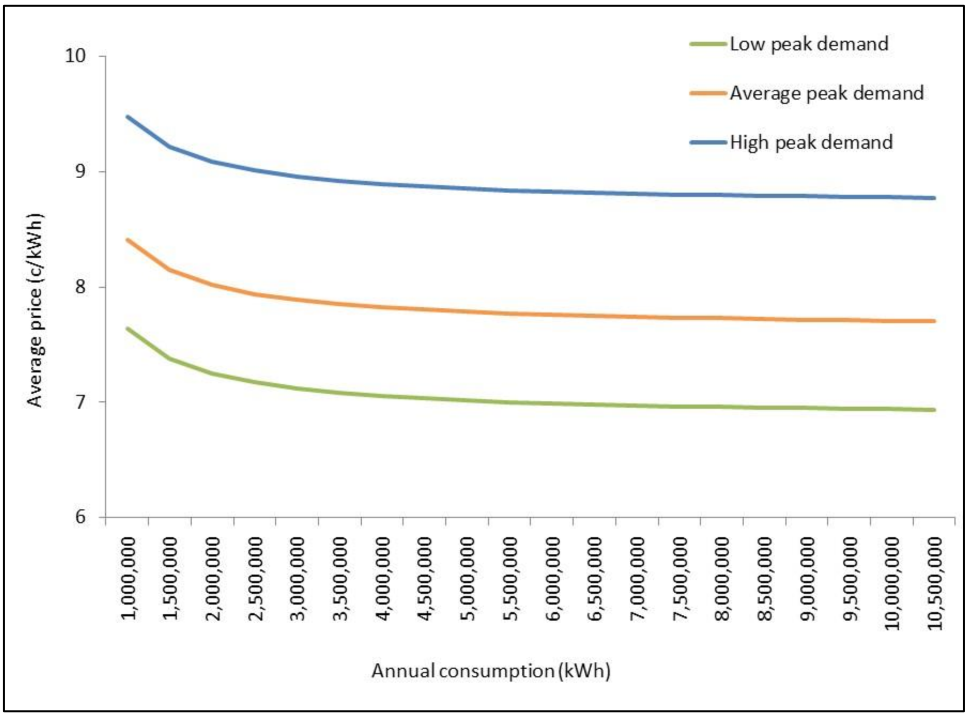


Figure 2.12 HV TOU Demand Network tariff – Customer LV (Code 121): price impacts by consumption profile (indicative 2019/20 tariffs)

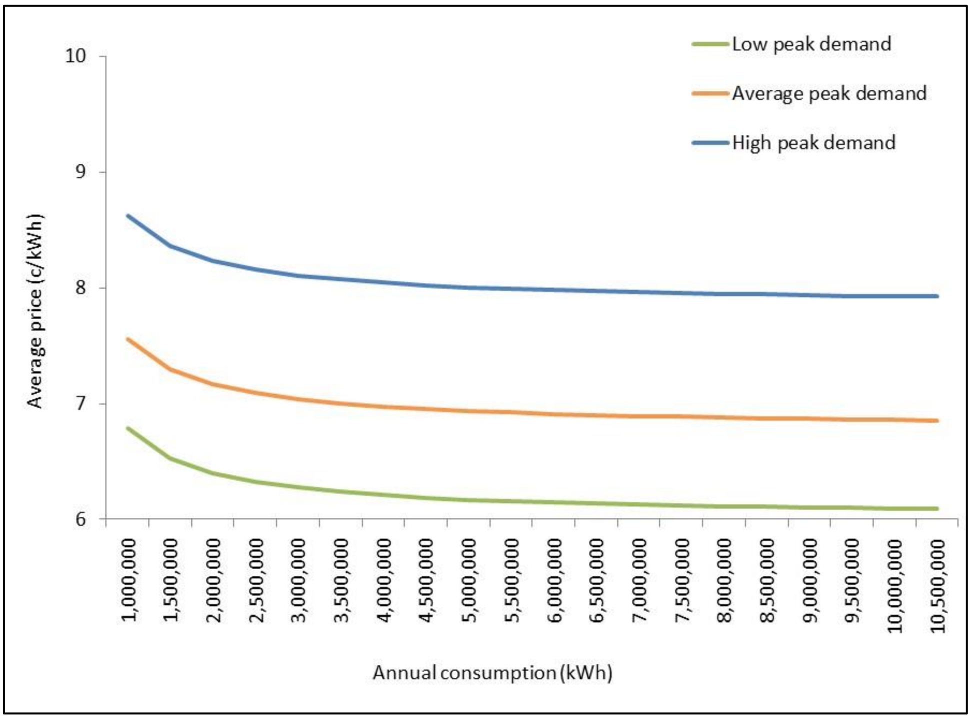
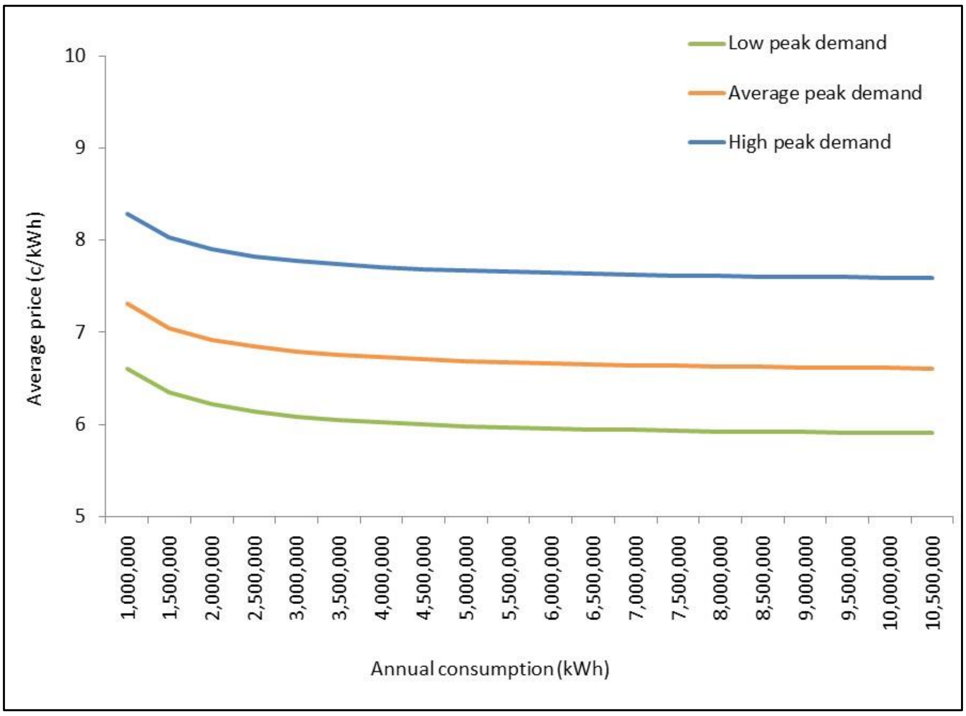


Figure 2.13 **HV TOU Demand Network tariff – Customer HV and LV (Code 122): price impacts by consumption profile (indicative 2019/20 tariffs)**



In summary, this theoretical analysis shows that an average customer on the LV kW Demand tariff is expected to be better off compared to being on the General Network or General TOU tariff (Figure 7.9). Furthermore, a customer with an average peak demand (during the peak charging window) is expected to be better off on the commercial kVA-based demand tariffs than a customer with a high peak demand.

2.3.5.2 SAMPLE-BASED COMMERCIAL CUSTOMER IMPACTS

As discussed in the introduction to section 2.2.2.2, one of the key concepts that forms the basis of Evoenergy's network tariff structure is an analysis of customer impacts based on sample data from actual commercial customers. Evoenergy has extracted customer electricity consumption and demand data to analyse customer impacts. This analysis has provided Evoenergy with a better understanding of consumption and demand patterns, to determine how a customer's network bill might be expected to change when the proposed commercial tariff reforms are applied.

The load profile for this sample data was compared to the total commercial load profile and a predominantly commercial zone substation load profile in section 2.3.2. The comparison showed the load profile across the sample data has a similar pattern to the load profile generated using total commercial data and predominantly commercial zone substation data. This similarity of profiles gives credibility to the sample of data being used to analyse the customer impacts. Hence, using this sample data will provide a realistic analysis of expected customer impacts.

The proposed changes to the LV and HV commercial demand tariff structures are separately analysed.

LV TOU kVA Demand and LV TOU Capacity tariffs

The customer impacts for the LV TOU kVA Demand and LV TOU Capacity tariffs are shown in Figure 2.14 and Figure 2.15.

The majority of customers on the proposed structure of the LV TOU kVA Demand and LV TOU Capacity tariffs on 1 July 2019, are expected to receive an annual network bill that is either the same or lower than their bill would have been under the current structure. Customers who peak within the peak charging window are expected not to see a change in their bill under the proposed peak charging window. Those who peak outside of the peak charging window are expected to receive a lower network bill under the proposed structure.

Specifically, the majority of customers (approximately 75 per cent) on the LV TOU kVA Demand tariff are expected to receive an annual network bill on the proposed structure that is the same as the network bill they would have received on the current LV TOU kVA Demand tariff (Figure 2.14). The remaining 25 per cent of customers are expected to receive a bill that is between 10 to 20 per cent lower than their bill on the current structure.

Similarly, over half of customers on the LV TOU Capacity tariff are expected to receive an annual network bill on the proposed new structure that is the same as the bill they would have received on the current structure (Figure 2.15). The remaining customers are expected to receive a bill that is up to 7 per cent lower under the proposed structure compared to the current structure.

Given that the sample is based on 2016 data, none of the customers in this sample are on the newly proposed versions of these tariffs, and are therefore not responding to the proposed tariffs' price signal. In future, customers on the these LV commercial tariffs who choose to respond to the price signals are expected to see bill reductions relative to the current structure of those tariffs, which will potentially move the distribution of customer impacts.

Figure 2.14 Distribution of customer impacts: Proposed LV TOU kVA Demand tariff compared existing LV TOU kVA Demand tariff (Annual bill)

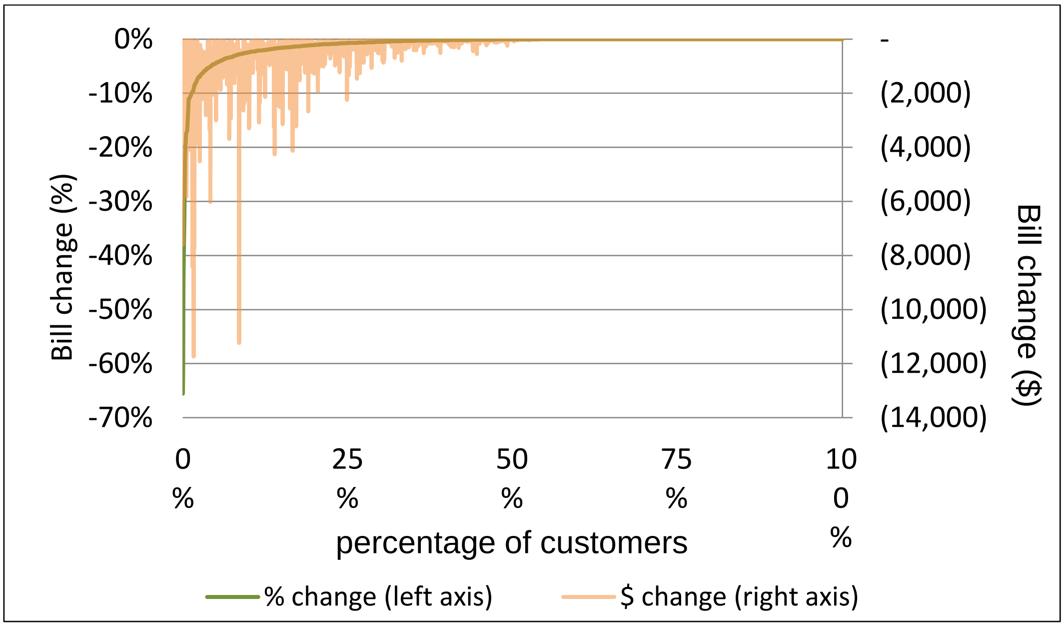
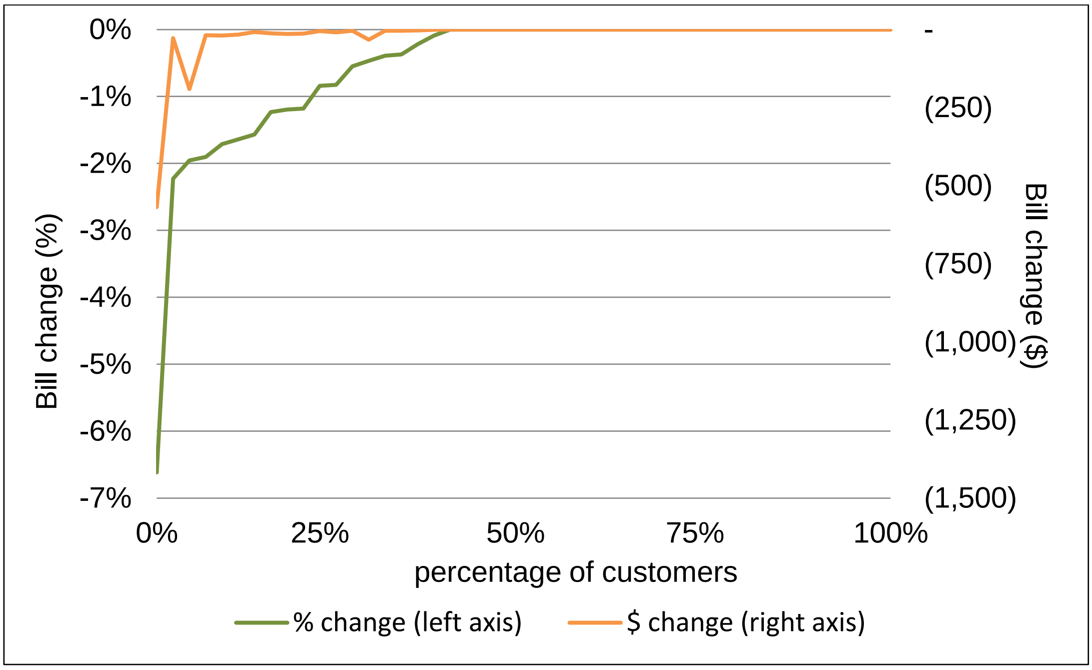


Figure 2.15 **Distribution of customer impacts: Proposed LV TOU kVA Capacity tariff compared Existing LV TOU kVA Capacity tariff (Annual Bill)**



The relationship between the difference in a customer's monthly network bill (when transitioning from the current to proposed form of the kVA demand tariffs), and their maximum demand during the peak charging window compared to anytime is shown in Figure 2.16 and Figure 2.17 below.

These figures show the largest monthly bill reductions (in percentage terms) are attributed to customers with the largest difference between peak and anytime maximum demand. Given that the demand charge is based on customers' maximum demand in a calendar month, this analysis considers the relationship between the change in customers' monthly bill.

Figure 2.16 Relationship between change in monthly bill (due to transition from current to proposed LV TOU kVA Demand tariff) and the difference between peak and anytime maximum demand

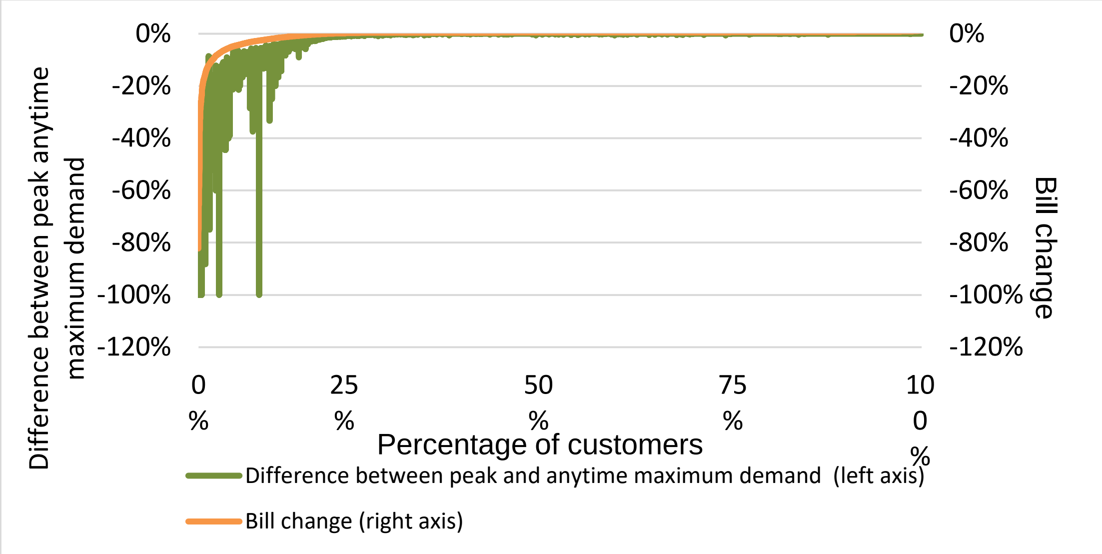
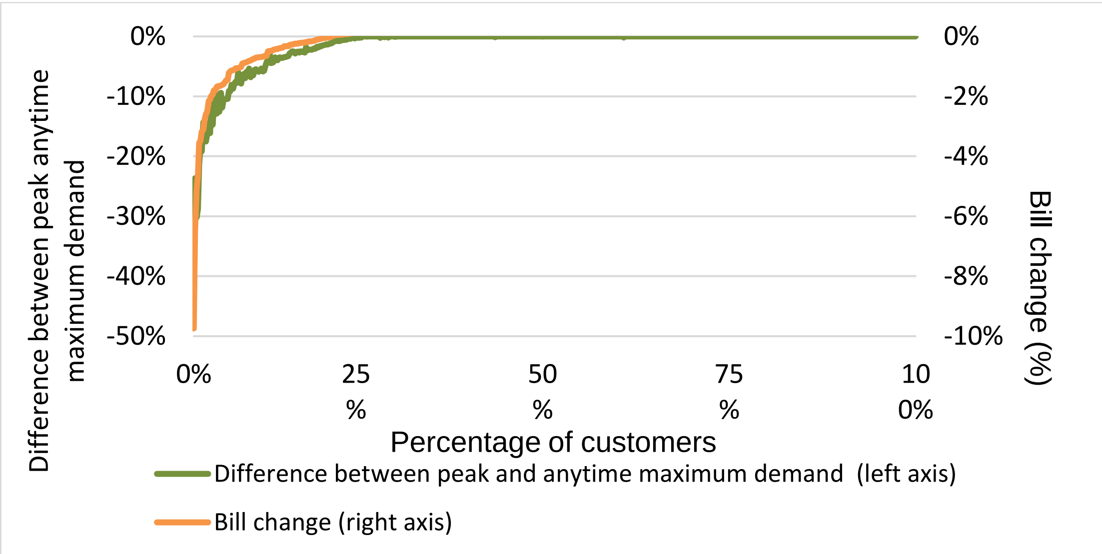


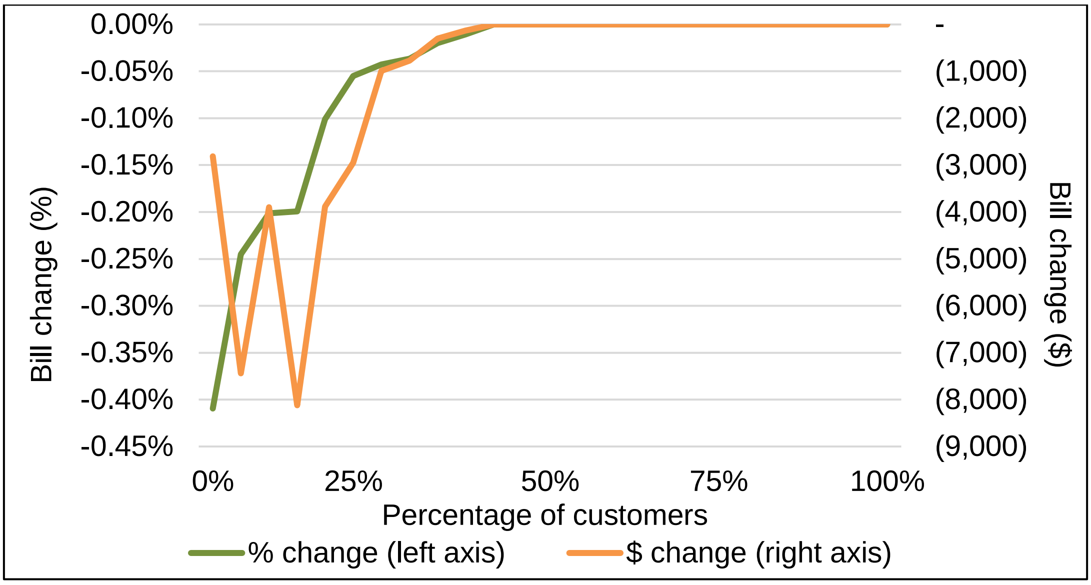
Figure 2.17 Relationship between change in monthly bill (due to transition from current to proposed LV TOU Capacity tariff) and the difference between peak and anytime maximum demand



HV commercial tariffs

As shown in Figure 2.18 below, given that the majority of HV commercial customers peak during the peak charging window, the proposed structural change to the tariffs is expected to result in most customers receiving the same bill as under the current tariff structure. A minority of Evoenergy's HV commercial customers' consistently record their peak demand outside the 7 am to 5 pm weekday peak charging window. These customers will incur lower demand charges (and therefore a lower network bill) because their own peak demand does not occur in the peak charging window. The proposed structural changes will offer HV commercial customers an incentive to reduce their demand during the peak charging window, and spread their load to outside of this period.

Figure 2.18 Distribution of customer impact: Proposed compared to existing HV TOU Demand tariff



Note: analysis based on HV TOU Demand Network – Customer LV tariff (code 121)

2.4 Proposed tariff structure for residential consumers

The following sections provide:

- an outline of the proposed changes to Evoenergy's residential tariff structure (section 2.3.1);
- an explanation of Evoenergy's charging windows applied to residential tariffs (section 2.3.2);
- an explanation of its residential customer assignment policy (section 2.3.3); and
- a description of indicative residential customer impacts (section 2.3.4).

2.4.1 Proposed changes to residential tariff structure

A summary of the proposed changes to the residential tariff structures is presented Figure 2.19.

Figure 2.19 **Summary of proposed changes to the residential tariff structure**

	Tariff Components				
	Fixed	Flat energy	Inclining Block energy	TOU energy	Seasonal peak demand
Residential Basic*	✓	✓			
Residential TOU	✓			✓	
Residential 5000*	✓		✓		
Residential Heat Pump*	✓		✓		
Off Peak (1) Night		✓			
Off Peak (3) Night & Day		✓			
Residential kW Demand	✓	✓		✓	✓

Opt out

* Obsolete to new customers from 1 December 2017

Note: Red indicates proposed change in 2019–24 regulatory control period

As can be seen in the last row of Figure 2.19, the structural change being proposed is the application of a TOU energy charge structure rather than a flat energy charge in the Residential kW Demand tariff. This change will make the provision for energy charges to be differentiated by time of use.

Switching the flat energy charge of the Residential kW Demand tariff to a TOU energy charge will offer residential consumers a more cost-reflective option. Enhancing the cost reflectivity of this tariff will mean consumers on the tariff will pay a bill that more closely reflects the long-term marginal cost of supplying electricity to them. It will also provide customers with greater opportunity to actively manage and control the distribution component of their electricity bills by considering when and how they use electricity. This is because TOU energy charges will encourage customers to shift their load to shoulder and off-peak times, which attract lower energy charges than at peak times.

The proposed changes to the residential tariff structure is supported by industry[24] research discussed in section 2.2.2.3. To recap, that research defines an optimal tariff structure as a three-part tariff comprising a fixed charge, TOU energy consumption charges, and a demand charge. This structure corrects for cross subsidies and improves economic efficiency.[25] The proposed changes to the Residential kW Demand tariff structure means that this tariff will closely mirror this optimal tariff structure.

Given the timing of the introduction of the Residential kW Demand tariff (1 December 2017), there has been insufficient time to analyse the impact of activating different TOU energy charges before the commencement of the 2019–24 regulatory period. Therefore, Evoenergy propose to set the peak, shoulder and off-peak TOU energy charges for the Residential kW Demand tariff at the same rate. Evoenergy proposes to allow sufficient time to analyse customer response data across time periods before setting different TOU energy charges. This approach is consistent with the recent QUT research[26], which found it is important that industry and stakeholders understand ‘consumers and their potential behavioural responses to new electricity pricing plans’. Hence, Evoenergy

[24] Paul Simshauser, 2014, Network tariffs: resolving rate instability and hidden subsidies.

[25] Ibid, p. 26.

[26] QUT and Citysmart*, 2017*, Taking advantage of electricity price signals in the digital age: Householders have their say, p. 9.

proposes to reform the *structure* of the Residential kW Demand tariff while maintaining a consistent price *level* across the TOU charging windows, to allow time to analyse the impact of the Residential kW Demand tariff before activating further changes within the tariff. As a result, the Indicative NUOS Pricing Schedule (Appendix 17.3) shows the proposed structure with the same charges set for each TOU charging window.

The proposed Residential kW Demand tariff structure is shown in Figure 2.20.

Figure 2.20 Residential kW Demand tariff

Fixed	Consumption	Demand
• cents/day	• c/kWh • based on time of use	• c/kW/day • based on consumer's maximum demand (1/2 hour), during a defined peak time period, in a calendar month

In line with current practice, the **fixed supply** component of the demand tariff would not vary with the level of energy consumption or demand. The fixed charge relates to the connection services provided to consumers and ensures approved revenue requirements are met (i.e. return of and on the undepreciated portion of sunk capital expenditure and fixed operating and maintenance costs associated with the existing asset base). The fixed charge signals the cost of maintaining connection assets as well as servicing consumers, for example, consumer related costs such as the network call centre.

Part of the consumer's bill would be based on **energy** consumption, with different rates applying at peak, shoulder and off-peak periods of the day.

Part of the consumer's bill would be based on the maximum **demand** that the consumer places on the network during the peak period. The demand component is structured in this way because it addresses the main driver of Evoenergy's future costs that can be influenced by consumers' current consumption behaviour. The demand component is applied to a set charging window as defined in the next section (Section 2.4.2).

The Residential Basic, Residential 5000, and Residential Heat Pump tariffs were closed to new connections from 1 December 2017 and will eventually become obsolete as customers receive Type 4 meters and are placed onto the more cost-reflective residential demand and TOU tariffs. Evoenergy does not propose to make any changes to these obsolete tariff structures or to the assignment policy.

2.4.2 Charging Window Analysis

Overview

As discussed in the introduction to Section 2, one of the key concepts that forms the basis of Evoenergy's network tariff structure is the separate price signals sent to residential and commercial consumers. Given that many areas of the ACT are dominated by either residential or commercial loads that have distinctively different load profiles, separate price signals are sent to residential and commercial customers via different charging windows. This means that residential customers located in a predominantly residential areas receive a price signal designed to address peak demand in residential areas. In this section, residential load profile data is analysed to review the charging windows for the Residential kW Demand and Residential TOU tariffs.

To define the charging windows for applicable residential tariffs, it is important to align the peak charging window with times at which the electricity network peaks in predominantly residential areas. To identify when the predominantly residential areas of the network peak, Evoenergy has compiled load profiles for the following:

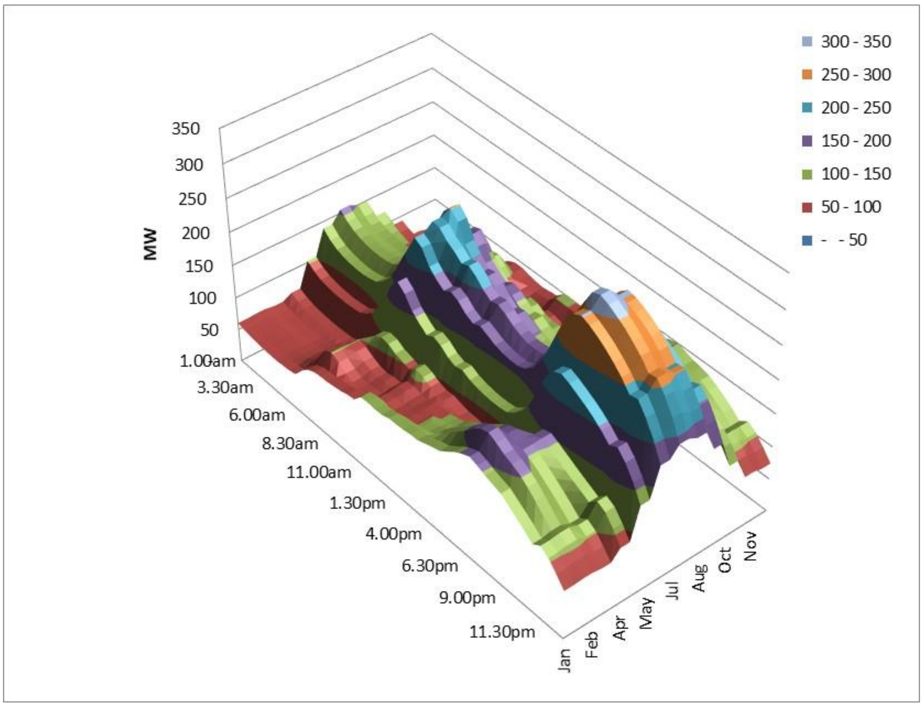
- total residential load profile (Figure 2.21);
- predominantly residential zone substations in the ACT (Figure 2.22); and
- sample of residential customers (Figure 2.23).[27]

The average residential load profile (Figure 2.21) has been derived by deducting the average small commercial load profile from the published AEMO net system load profile for the ACT.[28] It clearly shows that the residential load profile is higher in winter than other seasons, and is higher in the early evening than at other times of the day. This analysis can be compared to the load profile at predominantly residential zone substations in the ACT (Figure 2.22) and the load profile of a sample of residential customers (Figure 2.23). This comparison of the three sources of residential load profiles consistently shows that the residential load peaks in the early evening and during winter.

[27] Evoenergy conducted a study to analyse the effect of the residential demand tariff. Evoenergy has collected electricity consumption and demand data from around 300 premises in Canberra since December 2015. Evoenergy analysed the characteristics of these customer demand and consumption data to gain a better understanding of their usage and demand patterns. This is an ongoing study and will inform price setting in the future.

[28] AEMO, Load profiles. Retrieved from < https://www.aemo.com.au/Electricity/National-Electricity-Market-NEM/Data/Metering/Load-Profiles>.

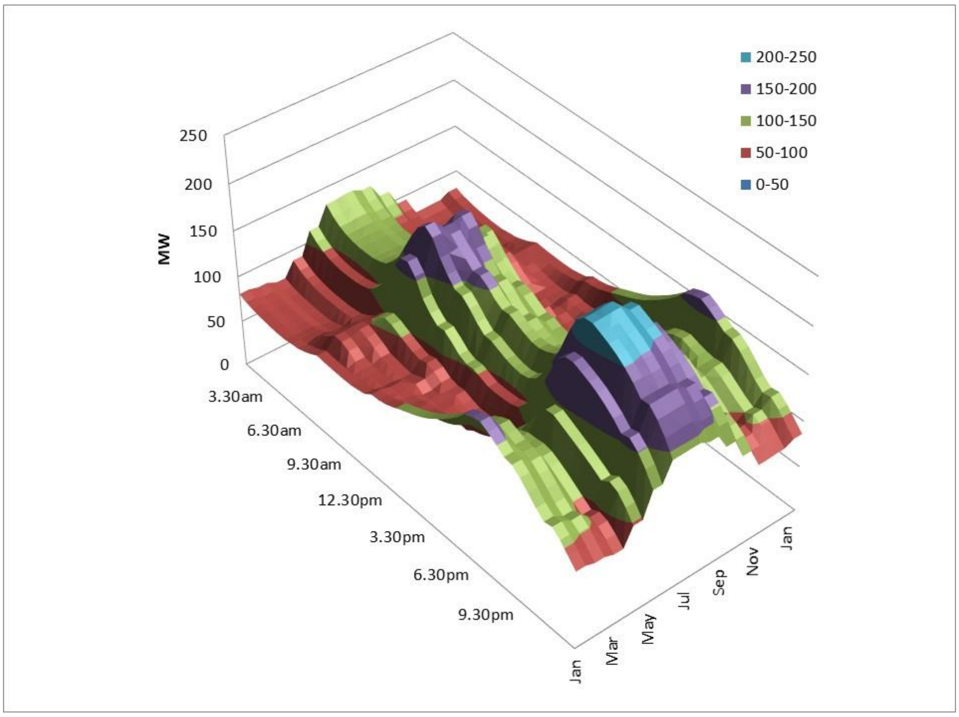
Figure 2.21 For each month and for each half hour, the average daily total residential load (MW), 2016



Source: AEMO and Evoenergy data

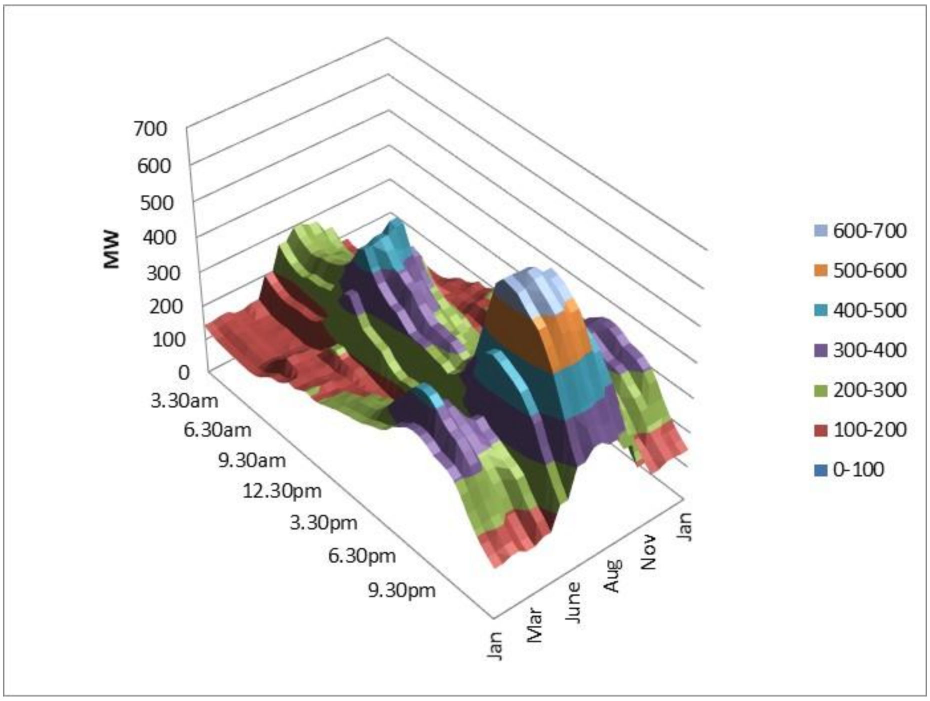
Note: estimated by deducting the average total residential load from the average total ACT load.

Figure 2.22 **For each month and for each half hour, the average daily total load (MW) for predominantly residential zone substations, 2016**



Source: Evoenergy

Figure 2.23 **For each month and for each half hour, the average daily total load (MW) of a sample of residential customers, 2016**



Source: Evoenergy

This analysis forms the basis of the charging windows set for applicable residential network tariffs. Further detailed analysis of load profiles is provided below to document that the residential charging windows associated with these Residential kW Demand and Residential TOU tariffs are appropriate.

Time of Day

A comparison of the above load profiles consistently shows that the residential load profile is highest in the evening between 5 pm and 8 pm. The second highest peak occurs in the morning between 7 am and 9 am. This is because most residential consumers are at home at these times of the day and the resulting activity in households is reflected in the high peaks occurring at these times of the day.

Day of Week

Evoenergy has also reviewed the days of the week at which peaks occur for residential consumers. Figure 2.8 below which shows the days of the week on which the top 20 peak days at five predominantly residential zone substations occurred, between 2013/14 and 2016/17. The table shows that, on average, peak days occurred 14 times on weekends and 86 times on weekdays. These averages can be considered in percentage terms: 14 per cent of peak days occur on weekends and the remaining 86 per cent of peak days occur on weekdays. On a percentage basis, the analysis can be compared to the percentage of days that occur on a weekend: 29 per cent (calculated as 2/7).

Given that residential peak demand occurs across a spread of weekdays and weekends, Evoenergy concludes that it is reasonable to continue applying the peak demand and TOU consumption charges uniformly across all days of the week.

Table 2.4 Top 20 peak demand days (per year) measured at five predominantly residential zone substations: weekdays and weekends

	2013/14	2014/15	2015/16	2016/17	Average
Weekdays	85	92	86	81	86
Weekends	15	8	14	19	14

Source: Evoenergy

Summary of charging window analysis

Based on the above analysis, it can be seen that, in the main, **maximum** demand for residential customers occurs:

- in the evening (5 pm to 8 pm);
- on a spread of weekend and weekdays; and
- is highest during winter.

Residential kW Demand Tariff: Charging Windows

Under the proposed tariff structure changes, the Residential kW Demand tariff has a peak **demand** charge and a peak **consumption** charge. The proposed charging window for both of the peak charges is from 5 pm to 8 pm daily.

In the first TSS, the AER approved the introduction of a Residential kW Demand tariff with seasonal demand charges set at the same level.[29] In that TSS, Evoenergy indicated

[29] AER 2017, ActewAGL Tariff Structure Statement, Final Decision, February 2017.

that it may activate the seasonal demand charges in the following regulatory period (2019–24). Given the timing of the introduction of the Residential kW Demand tariff (1 December 2017), there has been insufficient time to analyse the impact of activating different seasonal demand charges at the commencement of the 2019–24 regulatory control period. Rather, Evoenergy proposes to establish a project to monitor and analyse the Residential kW Demand tariff's demand and consumption data by season, day-of-week and time-of-day, to evaluate consumer response to the Residential kW Demand tariff. This approach will enable Evoenergy to set a cost-reflective tariff structure, while allowing sufficient time to analyse the demand data across seasons before setting different seasonal demand charges.

When engaging with retailers about the proposed changes to the structure of the demand tariff, they expressed reservations about activating additional changes until the impacts of the Residential kW Demand tariff are well understood[30]. This was primarily due to concern about the lack of knowledge of actual customer impacts and behavioural response to the Residential kW Demand tariff, which is consistent with Evoenergy's concerns. Other related concerns expressed by retailers included the following comments.

- It is important to maintain a tariff structure that is easily understood by customers.
- Retailers and customers have limited experience with demand charging. Introducing a demand charge based on a peak time period requires customer education. This education needs to be established before activating further changes.
- There may be significant changes in the timing of cash flows under seasonal demand charging.
- Explaining seasonal demand charging to customers in a call centre environment is difficult, especially when the concept of demand charging (without seasonality) is not widely understood.

This feedback is consistent with Evoenergy's intention to delay the activation of more cost-reflective elements of the Residential kW Demand tariff. As a result, the Indicative NUOS Pricing Schedule (Appendix 17.3) shows no variation in the seasonal demand charges of the Residential kW Demand tariff.

Table 2.5 provides a summary explanation of the demand charge within the Residential kW Demand tariff by showing the parameters and the reason for selecting those parameters. As explained above, the Residential kW Demand tariff will be based on the maximum half-hourly demand that occurs within the peak period of a calendar month.

[30] QUT and Citysmart*, 2017*, Taking advantage of electricity price signals in the digital age: Householders have their say.

Table 2.5 Residential kW Demand tariff parameters

	Parameter	Reason
Maximum demand	Maximum half-hourly demand period in a calendar month.	Sends price signal to consumers about the impact of their behaviour on network costs.
TOU consumption	TOU consumption charge.	Sends price signal to consumers about the impact of their behaviour on network costs.
Time-of-day	Maximum demand and peak consumption periods are constrained to peak period (5 pm to 8 pm).	Residential peaks occur in the evening (5 pm to 8 pm).
Day-of- week	Maximum demand and peak consumption window to apply every day of the week.	Peak demand days are driven by the weather and can therefore occur on weekends.
Seasonality	Same demand and peak consumption charge applied all year round (each calendar month). Consider adjusting for seasonality in the demand tariff, during EN19 regulatory period, when data is available.	Residential kW Demand tariff introduced on 1 December 2017. Structure has been set up so that demand charge may have a seasonal element in future.

Residential TOU Tariff: Charging Windows

Most residential customers with an interval (Type 5) meter in the ACT are on the Residential TOU tariff (18 per cent of all residential customers in 2016/17). These meters have been configured so that three separate registers record energy use at peak, shoulder and off-peak times of the day. The three TOU charges are then applied to the three energy recordings (based on the meter's three registers' recordings). To change the time periods applicable to the peak, shoulder and off-peak consumption charging windows would involve manually visiting each residential TOU customer's meter and changing the register configuration. The cost to change these meter configurations is expected to outweigh the benefit of changing the meters to refine the peak charging window. In any case, as customers with Type 4 meters default to the Residential kW Demand tariff, this issue will gradually dissipate. For this reason, Evoenergy does not propose to change the current residential TOU consumption charging windows. In any case, the peak charging window is set to two time periods: 7 am to 9 am and 5 pm to 8 pm daily. This latter charging window aligns with the residential demand tariff's peak demand and consumption charging window.

Table 2.6 Summary of residential tariff charging windows

kW Demand tariff:	
Peak demand	5 pm to 8 pm every day
Peak consumption	5 pm to 8 pm every day
Shoulder consumption	7 am to 5 pm; 8 pm to 10 pm every day
Off-peak consumption	All other times
TOU tariff:	
Peak consumption	7 am to 9 am; 5 pm to 8 pm every day
Shoulder consumption	9 am to 5 pm; 8 pm to 10 pm every day
Off-peak consumption	All other times

2.4.3 Proposed assignment policy

Evoenergy changed the residential customer assignment policy on 1 December 2017 in line with the introduction of the Residential kW Demand tariff and doesn't propose to make further changes in the 2019–24 period. Under this assignment policy, residential customers whose premises are fitted with Type 4 meters are assigned by default to the Residential kW Demand tariff, but have the ability to opt out to the Residential TOU tariff only. This assignment policy emphasises placing residential customers onto cost-reflective tariffs as soon as they have the necessary metering equipment installed (Type 4 meters). This includes new premises and existing premises where the meter has been replaced.

For residential customers without Type 4 meters, customers will remain on their existing tariff until their meter is changed to a Type 4 meter. The Residential Basic, Residential 5000 and Residential Heat Pump tariffs closed to new connections from 1 December 2017 and will eventually become obsolete as customers receive Type 4 meters and are placed onto more cost-reflective tariffs. This policy is proposed to continue in the 2019–24 regulatory period.

2.4.4 Proposed residential tariff structure

Our proposed residential tariff structure, tariffs, eligibility and assignment of consumers to tariffs is summarised in Table 7.7. In summary, each of the tariffs has been reviewed to base the tariff on LRMC (as per Rule 6.18.5(f)) and the changes to the Residential kW Demand tariff structure have been included.

Table 2.7 Evoenergy's proposed residential tariff structure and eligibility criteria

Tariff class	Tariff	Consumer eligible to receive tariff	Component	Unit	Charging parameter
Residential	Residential Basic Network	Residential consumers (as defined above) without Type 4 meters	*Fixed network access charge* *Energy consumption charge*	*¢/day* *¢/kWh*	
	Residential TOU Network	Residential consumers (as defined above) and electric vehicles recharge facilities (on residential properties) with a TOU meter.	*Fixed network access charge* *Energy consumption charge based on (TOU)*	*¢/day* *¢/kWh*	**Max Times:** 7 am – 9 am and 5 pm – 8 pm every day **Mid Times:** 9 am – 5 pm and 8 pm – 10 pm every day **Economy Times:** All other times
	Residential 5000	Residential consumers who have large continuous (rather than time controlled) loads, such as electric hot water systems, and consume over 5,000 kWh per annum.	*Fixed network access charge* *Inclining block tariff energy consumption charge with 2 tiers*	*¢/day* *¢/kWh*	*Tier break set at 60 kWh per day*
	Residential with Heat Pump	Only available to residential consumers with a reverse cycle air conditioner.	*Fixed network access charge* *Inclining block tariff energy consumption charge with 2 tiers*	*¢/day* *¢/kWh*	*Tier break set at 165 kWh per day*
	Residential kW Demand	Private dwellings (excluding serviced apartments) — including living quarters on farms, charitable homes, retirement villages, etc, with a Type 4 meter	*Fixed network access charge* *Energy consumption charge based on (TOU)* *Peak period demand charge*	*¢/day* *¢/kWh* *¢/kW*	**Max Times:** 5 pm – 8 pm every day **Mid Times:** 7 am – 5 pm and 8 pm – 10 pm every day ***Economy Times:*** *All other times* *Peak period for demand charge is 5 pm – 8 pm every day.*
	Off-Peak (1) Night Network	Available only to consumers utilising a controlled load element — it is applicable to permanent heat (or cold) storage, electric vehicle recharge, and CNG vehicle gas compression installations.	*Energy consumption charge*	*¢/kWh*	*Within controlled period: 10 pm – 7 am only*
	Off-Peak (3) Day & Night Network	Available only to residential consumers utilising a controlled load element — it is applicable to permanent heat (or cold) storage installations.	*Energy consumption charge)*	*¢/kWh*	*Within controlled period: 10 pm – 7 am and 9 am – 5 pm only*

Tariff class	Tariff	Consumer eligible to receive tariff	Component	Unit	Charging parameter
	Renewable Energy Generation	Consumers with grid connected solar or wind energy generation systems.	*Energy consumption/generation*	*¢/kWh*	

2.4.5 Indicative residential customer impacts

In this section, indicative residential customer impacts are analysed to determine how usage patterns affect residential customers' network electricity bills. The Indicative NUOS Pricing Schedule[31] on which these customer impacts are based, has been set such that an average customer:

- has a similar network bill on the Residential TOU tariff compared to the Residential kW Demand tariff; and
- is better off on the Residential kW Demand tariff than the Residential Basic tariff.

The customer impacts presented in this section test whether the indicative network prices meet these targets.

As already discussed, Evoenergy proposes to change the structure of the Residential kW Demand tariff in the 2019–24 regulatory control period from a flat energy charge to a TOU-based consumption charge. Evoenergy proposes to maintain the same rate for the peak, shoulder and off-peak consumption charges in the 2019–24 regulatory period. Due to this proposed approach, the indicative residential customer impact analysis uses the same consumption rate for the peak, shoulder and off-peak charges.

2.4.5.1 THEORETICAL RESIDENTIAL CUSTOMER IMPACTS

In this analysis, network electricity charges are calculated for a range of theoretical consumption profiles. The average price and network electricity bill is calculated for the Residential Basic, TOU and kW Demand tariffs, for a wide range of hypothetical consumption profiles (from 2,000 to 20,000 kWh pa) and three load profiles that reflect different maximum demands.

The total estimated network bill for a consumer on the Residential kW Demand (using different consumption profiles), Residential Basic and Residential TOU tariffs are depicted in Table 2.8.[32] Using the indicative charges for 2019/20, the annual network charge for an average residential consumer (7,000 kWh) on the Residential Basic tariff would be $710. This consumer would:

- be better off by about $225 over five years (or $45 pa) if they moved to the Residential TOU tariff;
- be better off by about $400 over five years (or $80 pa) if they were assigned to the Residential kW Demand tariff and responded to that tariff by achieving an average level of peak demand;
- be better off by about $782 over five years (or $156 pa) if they were assigned to the Residential kW Demand tariff and responded to that tariff by low level of peak demand; and
- be worse off by about $531 over five years (or $106 pa) if they were assigned to the Residential kW Demand tariff and exhibited a high level of peak demand.

The table also provides results for the effect of different load profiles for customers with both higher and lower levels of annual consumption.

[31] Appendix 17.3

[32] Based on 2019/20 charges in the Indicative Pricing Schedule.

Table 2.8 Estimated change in residential network bills (indicative 2019/20 tariffs)

	Total annual network bill			Difference from Basic tariff		
Annual consumption (kWh)	**4,000**	**7,000**	**10,000**	**4,000**	**7,000**	**10,000**
Residential Basic tariff	$449	$710	$1,057			
Residential TOU tariff (average profile)	$423	$665	$987	-$26	-$45	-$71
Residential kW Demand tariff (low peak demand)	$360	$553	$812	-$89	-$156	-$246
Residential kW Demand tariff (average peak demand)	$403	$630	$932	-$46	-$80	-$126
Residential kW Demand tariff (high peak demand)	$510	$816	$1,224	$61	$106	$167

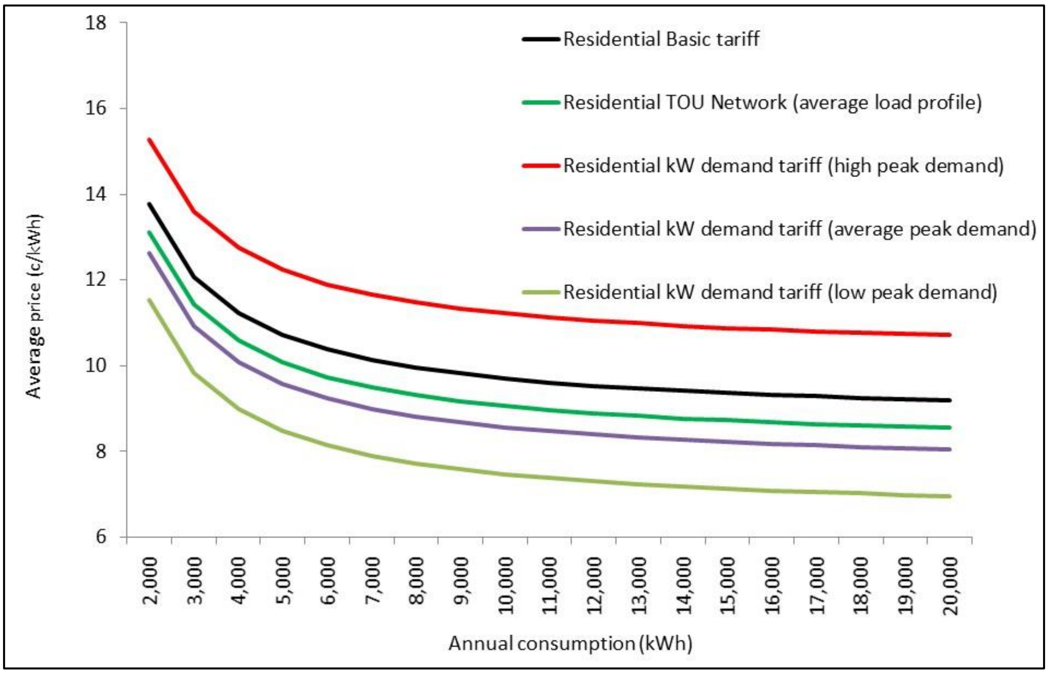
Source: Evoenergy

A comparison of network prices for residential consumers on the Residential kW Demand, TOU and Basic tariffs is depicted in Figure 2.24. Average prices (total bill divided by energy consumption) are shown on the vertical axis and the hypothetical annual consumption is shown on the horizontal axis (kWh). Figure 2.24 shows the following for consumers on the Residential kW Demand tariff.

- Consumers with an average peak demand are on average likely to receive a network bill slightly lower than what they could expect on the Residential Basic or Residential TOU tariffs.
- Consumers with a low maximum demand (and therefore a high load factor) are on average likely to receive a lower network bill than they would on either the current Residential Basic or TOU network tariffs.
- Consumers with a high maximum peak demand (and therefore a low load factor) are likely to receive a higher network bill than they would on either the Residential Basic or Residential TOU tariffs.

This is exactly what cost-reflective tariffs are designed to do: those who place a higher load on the network at peak periods bear higher costs. In contrast, residential consumers with a relatively low maximum demand during the peak period are expected to have the greatest saving when shifting from the Residential Basic or TOU tariffs to the Residential kW Demand tariff.

Figure 2.24 **Residential bill impacts for different consumption profiles (indicative 2019/20 tariffs)**



The Residential kW Demand tariff will result in some consumers paying less to use the network and others paying more. The impact of the Residential kW Demand tariff on individual customers will depend on their specific circumstances, such as their consumption and their peak demand profiles (which determines their load factor) and how they respond to the cost-reflective price signals. Customers with high (i.e. favourable) load factors are expected to be generally better off on the Residential kW Demand tariff than customers with low (i.e. unfavourable) load factors. Further, the impact on customer's bill will depend on how retailers choose to incorporate the proposed network tariff reforms into retail tariff structures (see section 2.4.6).

In summary, and consistent with how the Residential kW Demand tariff ought to work in principle, the indicative effect of the tariff on a consumer's network bill depends on their demand profile during the peak charging window.

2.5 Further Considerations

While the customer impacts have been modelled using a sample of actual customer data, this analysis assumes that retailers mirror the network tariff structure. That is, it assumes that the pricing signals designed to be passed through to customers in the network tariffs *are* passed through to customers in their retail electricity bill.

Further, the network component of a typical retail electricity bill is around 30–40 per cent.[33] Given this proportion, and assuming that retailers mirror the network tariff structure, the relative effect of the proposed changes on customer's retail bills becomes less significant. If the retailer chooses not to mirror the network tariff structure, then the proposed cost-reflective network tariff changes are potentially not seen by the retail customer which erodes the aim of improving efficient use of the network.

[33] Refer to Figure 3.1 in Appendix 17.1.

During the consumer engagement program (particularly by the ECRC) concern was expressed about the possibility of retailers not passing through cost-reflective network tariffs, as this would not only reduce the benefits to customer, but also reduce the ability of customer's to provide feedback to influence future network tariff reforms.

2.6 Other Tariff Structure Changes

Evoenergy proposes to make two adjustments to the network tariff structure to improve consistency and enhance simplicity. These proposed changes are explained in detail in sections 2.5.1 and 2.5.2.

2.6.1 Controlled load network tariffs

Controlled load network tariffs are applicable to installations which absorb their major energy during restricted times, but which may be boosted at the principal charge at other times. These installations include:

- water heating storage units where electricity is used to supplement other forms of energy (for example, solar hot water);
- permanent heat (or cold) storage installations;
- storage space heating or cooling, including under-floor, concrete-slab heating systems;
- swimming or spa pool heating, and associated auxiliaries, but not to spa baths;
- recharging electric vehicles; and
- compressing natural gas for CNG vehicles.

Evoenergy currently offers two controlled load tariffs as follows.

1. The **Off-peak (1) Night Network charge** provides operation for a minimum of six hours and a maximum of eight hours within any one day, between 2200 hours (10 pm) and 0700 hours (7 am).
2. The **Off-peak (3) Day & Night Network charge** provides operation for a total of 13 hours in any one day. The said 13 hours shall be comprised of eight hours between 2200 hours (10 pm) and 0700 hours (7 am) and five hours between 0900 hours (9 am) and 1700 hours (5 pm).

Evoenergy nominates the time settings for Off-peak (1) and Off-peak (3) charges. These two tariffs are currently available to both residential and commercial customers.

With the implementation of the Metering Rule Change from 1 December 2017,[34] customers with Type 4 meters are assigned to a demand tariff with the option to opt out to the TOU tariff. Both of these tariffs have peak demand or consumption charges based on a peak charging window, to send a price signal to customers about when it is more costly to use the network.

Offering commercial customers the Off-peak (3) Day and Night tariff enables commercial customers (for whom the peak charging window in their primary tariff is between 7 am and 5 pm weekdays) to access an off-peak rate of consumption (via a controlled load tariff_ during their peak charging window. This signalling provides a contradictory signal to commercial customers about the time of the day at which it is more costly to use the network. Specifically, the General TOU, LV kW Demand, LV TOU kVA Demand and LV

[34] AEMC, National Electricity Amendment (Expanding competition in metering and related services) Rule 2015, 26 November 2015.

TOU kVA Capacity tariffs all include (or are proposed to include) a peak consumption and peak demand charge which is applicable between 7 am and 5 pm on weekdays. Currently, the Off-peak (3) tariff enables LV commercial customers to access electricity at an off-peak rate during the same charging window. To eliminate this contradictory signalling, Evoenergy proposes to make the Off-peak (3) tariff obsolete to new commercial connections from 1 July 2019.

Evoenergy expects this proposed change to have a minimal impact on customers as there were approximately 20 commercial customers on this tariff as at July 2017 (compared to approximately 25,000 residential customers).

2.6.2 XMC Tariffs

Evoenergy currently offers two versions of each residential and LV commercial tariff: an XMC (Excludes Metering Capital) version and a non-XMC version. This approach was adopted from 1 July 2015 when the AER Final Decision stated that new regulated meters were to be paid upfront rather than via an ongoing annual charge (as before 1 July 2015).

For **existing regulated meters** installed before 30 June 2015, Evoenergy paid upfront for the capital costs of the meters which were then added to the asset base and recovered gradually, over the life of the meter, through annual charges. These customers (with a regulated Type 5 or Type 6 meter), continue to pay the following charges:

- a capital component of regulated annual metering charge; and
- a non-capital component of the regulated annual metering charge.

To facilitate these metering arrangements, Evoenergy currently includes the metering capital charge in non-XMC network tariffs.

For **regulated meter** connections installed between 1 July 2015 and 30 November 2017, the capital cost has bee paid upfront by the customer. Therefore, they pay only the non-capital component of the regulated annual metering charge. These customers are assigned to a network tariff that excludes metering capital charges (XMC tariffs). These two versions of tariffs ensured that Evoenergy and retailers were able to clearly identify, through the network billing system, which customers had paid for their meters upfront and were therefore not liable for the metering capital charge.

Now that this change has been in place for a few years, Evoenergy proposes to simplify the tariff structure by offering one version of each tariff from 1 July 2019. This version of tariffs would be consistent with the current XMC tariffs, which comprises network use of system (NUOS) charges and excludes any metering (capital or non-capital) charges. From 1 July 2019, Evoenergy proposes to separately add metering charges to the network bill, depending on customers circumstances. The table below shows the way in which metering charges will be applied, depending on customer’s circumstances.

Table 2.9 Application of metering charges

TYPE OF CUSTOMER	Pays Evoenergy metering capital charge	Eligible for XMC tariffs	Pays Evoenergy metering non-capital charges
Existing connection at 30 June 2015, Evoenergy provides metering service.	Yes	No	Yes
Existing connection at 30 June 2015, switches to another metering provider.	Yes	No	No
Existing connection at 30 June 2015, pays for new meter for PV system, Evoenergy provides metering service.	Yes	No	Yes
Existing connection at 30 June 2015 pays for new meter for PV system, later switches to another metering provider.	Yes	No	No
New connection (from 1 July 2015) pays for new meter, Evoenergy provides metering service.	No	Yes	Yes
New connection (from 1 December 2017) pays for new meter.	No	Yes	No
Existing connection at 30 June 2015 requires a replacement meter after 1 December 2017	Yes	No	No
Existing connection after 30 June 2015 requires a replacement meter after 1 December 2017	No	Yes	No

This approach to metering charges is similar to the way in which most other DNSPs charge for metering, and will not vary customers' bills in any way. That is, neither the network bill level nor structure will change. The change will be visible to customers who view the network schedule of charges, as it will contain fewer tariffs. Offering one version of each tariff rather than two will reduce the length and complexity of the network schedule of charges. This change will also impact the network and retail billing process. Evoenergy has consulted with both the network billing team and retailers. Both generally indicated they would be comfortable with the proposed approach.

2.6.3 Rebalancing

When preparing the Indicative Pricing Schedule for the second Proposed TSS, Evoenergy has carefully considered tariff rebalancing. This involved rebalancing to increase fixed charges relative to variable charges. The rebalancing also takes into account changes to the LRMC calculation for the 2019-24 regulatory control period, compared to the LRMC calculation in the first TSS.

2.7 Setting price levels

Evoenergy proposes to signal to customers the LRMC of providing network services at times of greatest utilisation using the demand charging parameter in demand tariffs and the peak energy charge in TOU tariffs. The demand charge was selected because it provides a signal to customers that more closely reflects the driver of network costs (i.e. peak demand).

Evoenergy then allocates residual costs. Residual costs are calculated based on the revenue requirement after the LRMC allocation that is not recovered from demand or peak energy charges. Residual costs are allocated to each tariff class on the basis of those customers' respective contribution to maximum demand on the network. The DUOS residual costs to be recovered from each tariff class are then allocated to network tariffs on the basis of relative consumption, which is used as a proxy for maximum demand in the absence of more granular metering data on maximum demand.

Finally, the DUOS revenue to be recovered from each network tariff is allocated to fixed and non-LRMC based variable charges. In the absence of reliable information on the price elasticity of demand, this allocation is guided by a rebalancing of the recovery of residual costs towards fixed charges and away from distortionary variable charges, subject to the extent this rebalancing can be achieved this without unacceptable network bill impacts for our customers.

Changes to Evoenergy's approach to converting LRMC into network prices (discussed in Addendum A.1) and the consequent changes in LRMC-based price levels limit the extent to which Evoenergy can rebalance the recovery of residual costs towards fixed charges in this TSS without unacceptable customer bill impacts. The long term interests of customers is best served by prioritising the transition of LRMC-based prices to efficient levels and managing customer bill impacts by means of the allocation of residual costs.

That said, to ensure there is no rebalancing away from fixed charges, fixed charges are increased for each network tariff by a constant rate equal to the annual increase in DUOS revenue over the 2019-24 regulatory control period. The remaining residual costs to be recovered from each network tariff (i.e. the DUOS residual costs to be recovered from a particular tariff less the DUOS residual costs recovered from the fixed charge) are then allocated to non-LRMC based variable charges.

This approach to estimating LRMC and converting those estimates into network prices, then allocating residual costs is discussed in more detail in Addendum A.1.

2.8 Tariff setting to comply with pricing principles

In this section, Evoenergy sets out how tariffs have been set, and how they comply with each of the pricing principles in the Rules.

2.8.1 Tariffs to be based on the LRMC

In order to be consistent with clause 6.18.5(f) of the Rules, Evoenergy's network tariffs are based on the LRMC of providing electricity network services. To guide the development of Evoenergy's tariffs, the Average Incremental Cost (AIC) approach is used to calculate LRMC. Evoenergy's approach to basing tariffs on LRMC is outlined in detail in Addendum 17.1 and Appendix 17.3.

2.8.2 There are no cross subsidies between tariff classes

The Rules include a pricing principle that is designed to avoid cross subsidies between different classes of consumers (that is, residential and commercial consumers). This principle requires the revenues recovered from each tariff class to be between the avoidable cost of not providing the service and the stand-alone cost of providing the service to the relevant consumers. This safeguards against large cross subsidies between tariff classes, consistent with clause 6.18.5(e). The existing side constraints, which limit annual price movements within a tariff class, are also retained. Addendum17.2 sets out how Evoenergy calculated stand-alone and avoidable costs.

2.8.3 Tariffs recover total efficient costs

The revenue to be recovered from each network tariff must recover the network business' total efficient costs of providing network services in a way that minimises distortions to price signals that encourage efficient use of the network by consumers. This principle has three parts:

1. to enable the recovery of total efficient costs;
2. that the revenue from each tariff reflects the total efficient cost of providing services to those consumers; and
3. that revenue is recovered in a way that minimises distortions to consumers' usage decisions, consistent with clause 6.18.5(g).

Each year Evoenergy will adjust the price levels, consistent with the approach outlined in this Proposed TSS, such that the expected revenue from all tariffs is in accordance with the AER's distribution determination. Evoenergy will also ensure that tariffs reflect the total efficient costs of serving each consumer assigned to each tariff by basing tariffs on LRMC (see Addendum 17.1).

2.8.4 Consideration of consumer impacts

Tariffs are to be developed in line with a new consumer impact principle that requires network businesses to consider the impact on consumers of changes in network prices and to develop price structures that are able to be understood by consumers, as per clause 6.18.5(h).

Evoenergy has considered the consumer impacts of changing network tariffs in determining how to transition consumers to cost-reflective prices over time (see Sections 2.3.5 and 2.4.5). Evoenergy agrees with the AEMC that clear, understandable and stable network prices, in accordance with the principles in the network pricing Rules, will facilitate the ability of consumers to receive and respond to future price signals.[35] Evoenergy's ability to move to more cost-reflective tariffs is dependent on constraints (discussed in section 6).

2.8.5 Capable of being understood

Evoenergy has designed tariffs to ensure it is reasonably capable of being understood by consumers, in accordance with clause 6.18.5(i).

Over time, as many network businesses across Australia move towards more cost-reflective tariff structures, the familiarity and therefore understanding of cost-reflective tariffs will

[35] AEMC 2014, National Electricity Amendment (Distribution Network Pricing Arrangements) Rule 2014, Rule Determination, p. 12.

improve. This will include a greater understanding of the drivers of network costs and how network prices reflect those costs.

In setting the proposed tariff structure for the 2019-24 regulatory control period, Evoenergy has carefully assessed the ability of consumers to understand changes to the tariff structure. For example, the energy charge within the kW demand tariffs for residential and LV commercial consumers are proposed to be changed from anytime to time-of-use based charges. While a more complex tariff may be more cost reflective, it is also less likely to be appreciated and understood, which may lead to consumers being unaware or unable to respond to the price signal. Through Evoenergy's continuing consumer engagement process, it will monitor understanding of consumers—particularly the recently introduced kW demand tariffs and assignment policy—and evaluate the trade-off between cost reflectivity and complexity to determine the most appropriate way in which the tariff structures could be altered in the future.

2.8.6 Tariffs comply with jurisdictional obligations

As per clause 6.18.5(j), network tariffs must comply with any jurisdictional pricing obligations imposed by state or territory governments. If network businesses need to depart from the above principles to meet jurisdictional pricing obligations, they must do so transparently and only to the minimum extent necessary. In line with ACT Government requirements, Evoenergy recovers the following jurisdictional schemes in the ACT (based on 2017/18).

- Energy Industry Levy $1.2m;
- Utilities Network Facilities Tax $7.3m;
- Feed-in Tariff (small and medium scale) $17.7m; and
- Feed-in Tariff (large schemes) $39.1m.[36]

These jurisdictional schemes are recovered in Evoenergy's NUOS tariffs.

2.8.7 Approach to updating tariffs annually

The AER is required to make a final determination on Evoenergy's TSS in early 2019. The AER's TSS determination will apply for each of the five years between 1 July 2019 and 30 June 2024.[37]

Evoenergy's annual pricing proposal[38] will apply methodology detailed in Addendum 17.1 and will:

- incorporate use of updated cost or volume information to derive updated tariff levels;
- explain material differences (if any) between the tariffs included in the TSS indicative pricing schedule and those in its annual pricing proposal; and
- demonstrate compliance with the AER's TSS final determination.

The Rules do not permit Evoenergy to amend the approved TSS in its first year.[39] Should it be necessary to revise the tariff structure for subsequent years, Evoenergy will consult with stakeholders and seek the approval of the AER nine months before any changes are to come into effect, pursuant to Rule 6.18.1B(b). Otherwise, as part of on-going consumer

[36] ActewAGL Distribution, 2017/18 Network Pricing Proposal, p. 26.

[37] After this, Evoenergy will be required to submit another TSS proposal together with a regulatory proposal for the regulatory control period 1 July 2024 to 30 June 2029.

[38] Consistent with the contents of the pricing proposal specified in Rule 6.18.2(b).

[39] Rule 6.18.1B(a) and 11.73.2. The financial year 2017/18 is the first year during which the TSS will be effective. This is the third year of Evoenergy's current regulatory control period (2015/16–2018/19).

engagement, Evoenergy proposes to discuss the annual changes with the ECRC, as a representative sample of consumers, and provide information to other consumers through its consumer engagement webpages.

Shortened forms

Term	Meaning
AAR	ActewAGL Retail
ACS	Alternative Control Services
ACT	Australian Capital Territory
AEMC	Australian Energy Market Commission
AEMO	Australian Energy Market Operator
AER	Australian Energy Regulator
AIC	Average Incremental Cost
c	cents
capex	capital expenditure
CNG	compressed natural gas
CPI	Consumer Price Index
DNSP	Distribution Network Service Provider
DUOS	Distribution Use of System
ECRC	Energy Consumer Reference Council
FiT	feed-in tariffs
GST	goods and services tax
HV	high voltage
ICRC	Independent Competition and Regulatory Commission
km	kilometre
kV	kilovolt
kVA	kilovolt-amperes
kW	kilowatt
kWh	kilowatt hour
LRMC	long-run marginal cost
LV	low voltage
MVA	mega volt amperes
MW	megawatt
MWh	megawatt hour
NPV	net present value
NSW	New South Wales
NUOS	network use of system
pa	per annum
PTRM	post-tax revenue model
PV	photovoltaic
repex	renewals expenditure

Term	Meaning
Rules	National Electricity Rules
SCS	Standard Control Services
TOU	time of use
TSS	Tariff Structure Statement
TUOS	transmission use of system
UG	underground
XMC	Excludes Metering Capital

A.1 Addendum 17.1: Price Setting Description

A1.1 Estimating Long Run Marginal Cost

The requirement to base network tariffs on LRMC when developing network prices reflects a fundamental economic concept - namely allocative efficiency. Allocatively efficient outcomes will be promoted if customers consume electricity up to the point where the marginal benefit to them of consuming an additional unit of energy (kWh, kW or kVA, depending on the cost driver being priced) equals the marginal cost of providing that extra unit of energy to that customer. When price deviates from the marginal cost of supply — in this case, the LRMC — customers will consume either:

- too much of the service. For example, when the price of an additional unit of electricity service is less than the cost of those services, some customers will consume more of those services. This creates an overall welfare loss (an economically inefficient outcome) as the cost of providing those customers with an additional unit of electricity services exceeds the benefit those customers receive from consuming those electricity services; or,
- not enough of the service. For example, when the price of an additional unit of electricity services is greater than the cost of those services, some customers will be unable consume those services (perhaps due to a budget constraint). This creates an overall welfare loss (an economically inefficient outcome) as the overall net benefits of supplying electricity services could be increased by reducing the price of the electricity services and thereby allowing customers to obtain the benefits of consumption that are in excess of the LRMC.

A1.2 LRMC Approach

The LRMC of providing a network service can be calculated in a number of different ways. One calculation method is the Average Incremental Cost (AIC) approach, which is underpinned by a business' forecast of the change it expects to incur in its future costs (numerator) as a result of its forecast change in demand for its service/s (denominator), with both the numerator and denominator discounted back to create a net present value (NPV).

$$\frac{\text{NPV (Forecast capital and operating costs)}}{\text{NPV (Forecast growth in service attribute driving those costs)}}$$

An alternative approach is to use the perturbation approach. This approach, in practical terms, seeks to ascertain how a business' expected future costs would change (in NPV terms) if there were to be an incremental increase (or decrease) in the future levels of demand for its services, relative to its underlying forecast.

$$\frac{\text{NPV (Revised Capex \& Opex Program } \textit{less} \text{ Initial Capex \& Opex program)}}{\text{NPV (Revised demand forecast } \textit{less} \text{ Initial Demand Forecast)}}$$

Consistent with Rule 6.18.5 (f), Evoenergy have considered the costs and benefits of both methodologies and have adopted the AIC method of calculating the LRMC, along with an evaluation period of 10 years. The AIC approach ensures that if Evoenergy's underlying demand and cost forecasts eventuate, the NPV of revenue generated over the evaluation period from the implementation of LRMC-based tariffs will equal the NPV of the costs that Evoenergy incurs. Also, the AIC method was preferable because it is underpinned by forecasts that are included in the 2019-24 Regulatory Proposal. Further, this approach is commonly used by distribution networks as it is generally considered to be well suited to situations where there is a fairly consistent profile of investment over time to service growth in demand.

A.1.2.1 Improvements to estimation of Long Run Marginal Cost

Evoenergy made a number of improvements to its methodology for estimating LRMC in this TSS, including:

- the extent to which replacement expenditure should be reflected in the estimate of LRMC used to set prices was investigated;
- the precision of both the expenditure and demand inputs used in the LRMC calculation was refined; and

Attached to this TSS is a report by HoustonKemp that reviews the methodology for compliance with the requirements of the Rules. HoustonKemp concluded that the methodology complies with the requirements of the Rules, is consistent with the economic concept of LRMC and reflects the particular circumstances of Evoenergy's customers and network.

The HoustonKemp report includes a description of the methodology (see Appendix 17.3). The following sections present a brief summary of the price setting methodology.

A.1.2.2 Research on replacement expenditure

A detailed analysis of replacement expenditure with respect to the estimate of LRMC is presented in Appendix 17.3. In essence, Evoenergy's research identified that:

- replacement expenditure is only avoidable in areas of the network where demand is declining;
- not all replacement expenditure in those areas is potentially avoidable;
- the relationship between demand and replacement expenditure is generally not linear;
- downsizing an asset upon replacement must be evaluated against the risk that an unexpected increase in demand requires future augmentation costs that exceed the initial cost savings from downsizing; and
- the LRMC of a decrement in demand in areas of declining demand is likely to be significantly less than the LRMC in areas of the network where demand is growing.

Prices are set based on the LRMC of an increment in demand because demand growth is forecast to be more prevalent on the network than declining demand. Specifically:

- network demand is expected to increase by 5 per cent in the 2019-24 regulatory control period;
- demand at only four of the 15 zone substations is forecast to decline in the 2019-24 regulatory control period; and
- demand growth in the 2019-24 regulatory control period is expected to be approximately five times greater than the decline in demand (in absolute terms) in other areas of the network.

Further, the evidence that LRMC is higher in areas of our network where demand is growing suggests that the cost consequences of sending a price signal that is too low in areas where demand is increasing are materially greater than the potential cost savings arising from a reduction in demand in areas where demand is declining.

Finally, reflecting the LRMC in areas of declining demand in the estimate used to set prices would necessarily reduce the level of LRMC-based prices (because LRMC in areas of falling demand is likely to be much lower). This would, in turn, require:

- the recovery of more residual costs from fixed charges, with potential adverse customers bill impacts; and/or
- the recovery of more residual costs from less efficient (more distortionary) non-LRMC based variable charges.

A.1.2.3 Refining demand and expenditure inputs

Evoenergy has refined the expenditure inputs to the LRMC calculation by reviewing the drivers of all demand driven capital expenditure projects considered for inclusion in the LRMC. This is because the classification of augmentation expenditure for network planning purposes can in some cases be improved for the purpose of estimating LRMC. Consequently, some costs from the augmentation plan were excluded for the purpose of estimating LRMC.

Similarly, capital expenditure inputs are annuitized to account for potential end-effects arising from the use of a ten year estimation horizon, which would otherwise bias the estimate of LRMC.[40]

The demand inputs to the LRMC calculation were also refined by removing the off-setting effect of zone substations where demand is falling. In particular, the forecast demand used in the denominator in the AIC calculation was, in each year, equal to the sum of forecast demand at those zone substations where demand is forecast to increase over the evaluation period. This removed the off-setting effect of the few zone substations where demand is forecast to decline, the inclusion of which would act to artificially understate the additional demand served as a result of the expenditure in the numerator to the AIC calculation.

In other words, Evoenergy's proposed approach will better link forward looking costs to changes in demand for the purpose of its analysis of LRMC and, therefore, improve the estimation of LRMC.

A.1.2.4 Deriving LRMC estimates for each tariff class

Evoenergy estimates the LRMC of providing network services to customers in each of the three tariff classes, whereas previously (in the first TSS) prices were based on a single estimate of LRMC for all customers.

Evoenergy derived tariff class-specific demand forecasts by evaluating the extent to which customers in each tariff class contributed to peak demand on the network, and then apportioning the demand forecast to each tariff class on that basis.

Further, a detailed review of each relevant capital expenditure project was undertaken to identify the extent to which each project is driven by the demand of customers in each tariff class. This approach is more accurate than simply allocating forecast expenditure to tariff classes on the basis of a high-level allocation key such as 'contribution to maximum demand'. Evoenergy adopted an assumption that growth related operating expenditure is equal to 2 per cent of growth-related capital expenditure in each year of the evaluation period.

Estimates of the LRMC of providing network services to customers in each tariff class are included in Table A.1 below.

[40] Capital expenditure was annuitized over a representative useful life of 45 years and on the basis of a pre-tax real weighted average costs of capital.

Table A.1 LRMC by Tariff Class (2018$/kW p.a.)

Tariff Class	LRMC
Residential	172
LV Commercial	103
HV Commercial	26

A.1.2.5 Converting estimates of LRMC into prices

The above estimates of LRMC, expressed on a kW per annum basis, are converted into efficient price levels using the following formulae.

- Non-time of use (ToU) charges

$$LRMC\ estimate\ (\$\ /\ kWh) = \frac{LRMC\ (\$\ per\ kW\ p.a.)}{8760\ hours};$$

- ToU peak energy charges:[41]

$$LRMC\ \ estimate\ (\$\ /\ kWh\ ) = \frac{LRMC\ (\$\ per\ kW\ p.a)\times Prob.\ MD\ occurring\ during\ time\ period}{Total\ number\ of\ hours\ in\ time\ period\ in\ the\ year};$$

- Peak demand charges

$$LRMC\ \ estimate\ (\$/kW/day\ ) = \frac{LRMC\ (\$\ per\ kW\ p.a)\times Prob.\ MD\ occurring\ during\ time\ period}{Total\ number\ of\ days\ in\ the\ year};$$

This approach to converting estimates of LRMC into price levels represents an improvement to the previous approach and, for some tariffs, resulted in strictly LRMC-based price levels that would give rise to unacceptable customer bill impacts. In these circumstances, prices are to be transitioned to the efficient LRMC-based price level so as to avoid any unacceptable customer bill impacts.

Estimates of LRMC, like those of other DNSPs, vary through time and so transitioning to LRMC-based price levels, where necessary, will generally assist in smoothing intertemporal variation in LRMC-based prices.

A1.3 The allocation of residual costs

Absent reliable information on customers' price elasticity of demand for distribution network services – which is theoretically required to minimise distortions to price signals for efficient usage – DUOS residual costs are allocated to network tariffs on the basis of network cost drivers. This ensures the level of DUOS revenue expected to be recovered from each network tariff and across all network tariffs complies with the requirements of clause 6.18.5(g)(1) and 6.18.5(g)(1), respectively.

In particular, DUOS residual costs are allocated to each tariff class based on its respective relative contribution to maximum demand on the network. Evoenergy then allocates the DUOS residual costs to be recovered from each tariff class to network tariffs on the basis of relative consumption, which is used as a proxy for maximum demand in the absence of more granular metering data on maximum demand. As more of our customers get Type 4 meters and Evoenergy acquire more granular data on maximum demand Evoenergy will

[41] 'MD' is an abbreviation of 'maximum demand' in this expression.

look to allocate revenue to network tariffs on the basis of maximum demand, rather than consumption.

As to the allocation of DUOS residual costs to the charging parameters that comprise each tariff, the AEMC explained that:[42]

> *The underlying principle that minimises distortions to efficient usage decisions is to assign residual costs to tariff components in inverse proportion to consumers' responsiveness to that tariff component.*

Although Evoenergy does not have reliable information on the price elasticity of demand at the charging parameter level, economic theory establishes that fixed charges are the most appropriate charging parameter by which to recover residual costs because they are the most price inelastic. Therefore, our allocation of DUOS residual costs is guided by a rebalancing of the recovery of residual costs towards fixed charges and away from more distortionary variable charges, subject to the extent Evoenergy can achieve this rebalancing without unacceptable network bill impacts for our customers.

However, changes to the approach used to convert LRMC into prices and the consequent transitional LRMC-based prices limit the extent to which Evoenergy can rebalance the recovery of residual costs towards fixed charges in this TSS (due to the potential for adverse customer bill impacts). Therefore, to ensure Evoenergy does not rebalance away from fixed charges, fixed charges were increased for each network tariff by a constant rate equal to the annual increase in DUOS revenue over this regulatory control period. Evoenergy then allocates to non-LRMC based variable charges the remaining residual costs to be recovered from each network tariff (i.e. the DUOS residual costs to be recovered from a particular tariff less the DUOS residual costs recovered by means of the fixed charge).

[42] AEMC, *Rule Determination – National Electricity Amendment (Distribution Network Pricing Arrangements) Rule 2014*, November 2014,

p.159.

A.2 Addendum 2: Standalone costs and avoidable costs

This Attachment discusses the methodology Evoenergy used to generate the stand alone and avoidable cost efficiency test. In setting its tariffs, Evoenergy must comply with Rule 6.18.5 (e) which requires:

> *'…that for each tariff class, the revenue expected to be recovered must lie on or between:*
>
> > *(1) an upper bound representing the stand alone cost of serving the retail consumers who belong to that class; and*
> >
> > *(2) a lower bound representing the avoidable cost of not serving those retail consumers'*

For a tariff to be deemed to be efficient under the Rules, it must deliver a stream of revenue from a class of consumers that is between this upper and lower bound. This is commonly known as the 'efficient pricing band'. Tariff prices are deemed to be efficient if revenue recovered is (1) less than the stand alone cost and (2) greater than the avoidable cost. There are two reasons why a price within this 'band' is deemed to be efficient.

1. Less than the stand alone cost: Breaching this upper bound may result in that tariff class being incentivised to inefficiently by-pass Evoenergy's existing distribution network in order to avoid paying Evoenergy's network tariffs, despite the fact that the incremental cost to Evoenergy of providing these services to that consumer (or tariff class) may be less than the alternative (by-pass) option.
2. Greater than the avoidable cost: If the revenue expected to be recovered from a tariff class does not exceed the cost that the business would avoid if they did not provide them with electricity services, that tariff class is (a) being subsidised by other tariff classes, and (b) would be over-consuming electricity services, relative to efficient levels (assuming that the consumer or tariff class' demand curve is not perfectly inelastic).

The estimation of avoidable costs and stand alone costs are explained separately below. These cost estimates are then compared to the expected revenue from each tariff class in Table A1.

Stand Alone Costs

Evoenergy has taken a tailored approach to establishing the costs that relate to the different tariff classes.

A key assumption that Evoenergy has made in interpreting the Rules is that the stand-alone cost test should reflect the opportunity cost to the consumer of maintaining their existing connection to the distribution network (i.e., it should reflect the next most feasible, economic alternative to the current electricity supply solution). This principle is central to the economic equation faced by the consumer: – to stay connected to the distribution network, and pay a retail electricity bill that reflects all components of the electricity value chain; or disconnect from the distribution network, and instead, adopt an alternative source of electricity.

Evoenergy notes that there are a number of methodologies that can, and have previously been, utilised to estimate the stand-alone cost of servicing a consumer, or group of consumers. These broadly include:

- A by-pass solution, that assumes a:
  - Network solution: For example, the construction of a connection from the consumer's premises into the transmission network in order to by-pass the distribution network, or
  - Non-network solution: For example, on-site generation via the construction of a solar PV system plus battery storage plus (potentially) back-up generation (for residential and small commercial consumers) or an embedded generation system (for larger consumers).
- A 'notional' network solution, that assumes a:
  - 'Bottom-up' build of stand-alone costs, via the construction of a modern day equivalent, optimised asset base in support of the delivery of services to each consumer or group of consumers on a stand-alone basis; and
  - 'Top-down' approach, which involves allocating each existing asset / asset type to a consumer or group of consumers, based on some allocation process/methodology. The allocation driver is generally based on the key underlying cost driver.

Having regard to this, Evoenergy has utilised the by-pass solution methodologies to calculate the stand-alone cost of supply. The methodology used by Evoenergy differs for HV commercial consumers compared to residential and LV commercial consumers.

Evoenergy has taken a "modelled" network approach for **HV commercial consumers** based on their respective circumstances. This involves modelling the total cost of by-passing the distribution network and connecting a consumer into the existing electricity transmission network, with the stand alone test being such that every modelled consumer's DUOS bill must be less than their calculated stand alone cost. To do this, Evoenergy has estimated the costs (in NPV terms) that two of its largest HV commercial consumers would have to incur if they were to by-pass Evoenergy's distribution network, and then compared this to the NPV of those consumer's future DUOS bills.

Evoenergy has taken a "modelled" non-network approach for **residential and LV commercial consumers**. This means that the cost per kWh of installing, operating and maintaining a standalone power system that is configured is based on typical retail/small commercial consumer's consumption profile (as applicable) and provides an equivalent level of reliability to consumers. To do this, Evoenergy estimated the cost to various sized residential and small commercial consumers of installing a PV and battery system. Evoenergy then compared the cost to each type of consumer of installing these systems (in NPV terms) to an estimate of the *retail* bill that each consumer would avoid (again, in NPV terms) if they were to cease obtaining reticulated electricity services.

Avoidable Costs

With regard to avoidable costs, Evoenergy's model includes long term assumptions consistent with the LRMC approach set out in Addendum 17.1. With respect to the consumption profile of the consumer, Evoenergy assumes that the consumers would make a contribution to co-incident peak demand consistent with an average consumer within that tariff class. Therefore:

*the avoided cost = the average coincident peak demand (kVA) for that tariff class * $kVA LRMC calculated for their relevant voltage level*

In relation to the Avoidable Cost test (which checks that a tariff class' avoidable cost is less than the DUOS revenue for that tariff class), Evoenergy notes that there are a number of factors that affect the way the avoidable cost of supply could be estimated. These factors are discussed below along with the implication and approach taken by Evoenergy.

The period over which avoided costs should be calculated (short term versus long-term).

Implication: This will affect whether or not avoided capex costs should be included, or just operating and maintenance costs,

- Approach: The average consumption (kWh) of each consumer class has been estimated and then multiplied by an estimate of the short-run operating and maintenance costs ($/kWh), in order to inform our estimate of the costs that Evoenergy would avoid if an average consumer within that tariff class no longer required any energy to be transported through Evoenergy's distribution network.

- The consumption profile of the consumer assumed to be disconnecting from the grid.
  - Implication: This will affect whether or not Evoenergy will avoid future augmentation costs (because this will be a function of whether or not and the degree to which a consumer is assumed to use electricity at times when the broader network is peaking).
    - Approach: The co-incident peak demand of each consumer class has been estimated and multiplied by the LRMC of supply in order to inform our estimate of the costs that Evoenergy would avoid if an average consumer within that tariff class no longer consumed energy during times of system peak demand.
- Whether the avoided cost calculation should be based on the avoided costs of serving an individual consumer, or a group of consumers, and if the latter, whether that group should be assumed to be in a similar location.
  - Implication: This will influence whether future capital expenditure associated with upgrading the network to meet required levels of service and replacement expenditure should be included in the calculation.
    - Approach: The avoidable cost calculation is based on the avoided costs of serving an individual consumer rather than a group of consumers, except in regions where large upgrades are expected and en-masse disconnection of a consumer class could change upgrade requirements. This methodology implicitly assumes that Evoenergy will not avoid, or be able to downsize or change the timing of, any replacement expenditure if a consumer disconnects from Evoenergy's network.

Table A2-2 below shows the results of the avoidable cost and stand alone cost efficiency tests for each tariff class.

1. The avoidable cost is lower than the DUOS revenue for each tariff class.
2. The standalone cost is greater than the revenue for each tariff class.
   a. In the case of our *residential and LV commercial consumers*, the stand alone cost should be compared to the NUOS revenue because we assume that the consumers in these tariff classes would bypass the electricity grid altogether. Hence the relevant revenues to be compared in the stand alone cost test are those where the consumer no longer pays the NUOS bill. The analysis shows that the NUOS revenues are still lower than the stand alone cost.

b. In the case of our *HV commercial consumers*, the stand alone cost should be compared to the DUOS revenue because the stand alone cost for those consumers is based on by-passing only the distribution network (and connecting into the transmission network).

Hence, the table shows that the NUOS and DUOS revenue for each tariff class lies within the lower bound of the avoidable cost and the upper bound of the stand alone cost. The tariffs therefore comply with Rule 6.18.5 (e).

Table A.2 Avoidable and standalone costs, 2019/20 ($'000)

	Avoidable Cost ('000)	DUOS Charges ('000)	Stand Alone Cost ('000)
Residential	11,499	61,657	128,106
LV Commercial	15,546	73,547	132,152
HV Commercial	128	8,576	116,734
Total		143,780	