Appendix F.1

Tariff Structure Statement Overview

Revised proposed access arrangement

15 November 2022

westernpower

Access Arrangement (AA) for the period
1 July 2023 to 30 June 2027

EDM 61204656

Tariff Structure Statement Overview

To apply from 1 July 2023

EDM 61204656

Contents

1. Introduction

Western Power has prepared this revised Tariff Structure Statement (**TSS**) for application in the fifth access arrangement for the period from 1 July 2022 to 30 June 2027 (**AA5**). It incorporates feedback received from our stakeholders, and from the Economic Regulation Authority (**ERA**) in its draft decision published on 9 September 2022 (**Draft Decision**) in relation to the TSS included in our AA5 initial proposal.

The requirement to prepare a TSS was introduced into the *Electricity Networks Access Code 2004* (**Code**) in 2020, along with a two-stage pricing process where:

- as part of our AA5 proposal, we submit to the ERA our proposed pricing methodology in the TSS for approval; and
- at least three months before 1 July of each year of the AA5 period, we submit to the ERA an annual price list for that year, which must comply with the approved TSS.

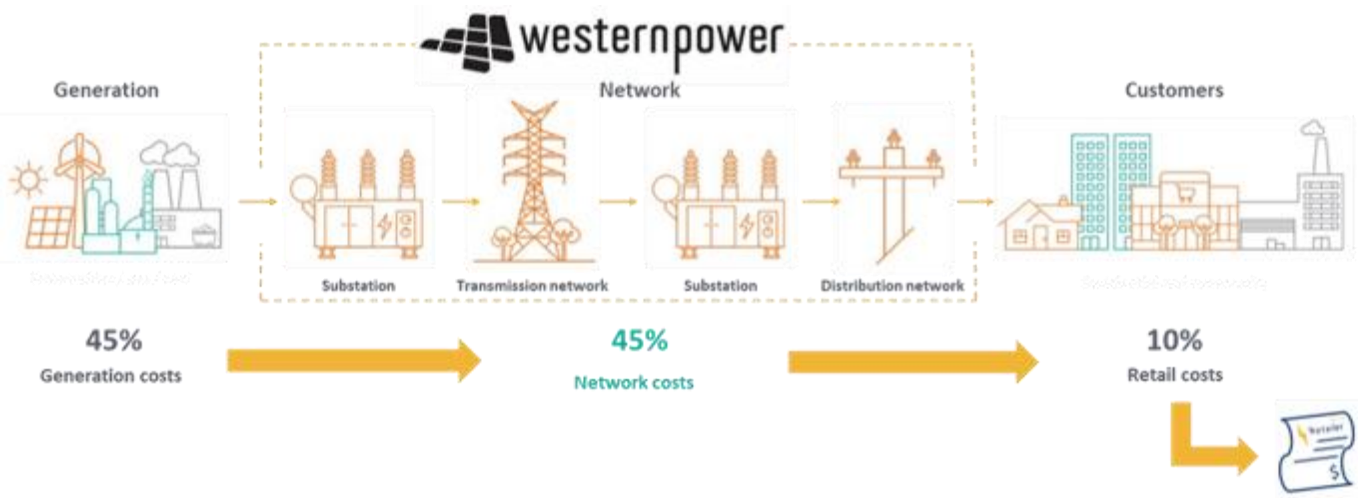
Under the Code we must submit our initial price list for the AA5 period within 15 days of the ERA's final decision on our access arrangement and, prior to that, include in our TSS a forecast of the weighted average price change for each reference tariff over the AA5 period.

Our TSS provides transparent information on how we will set network distribution and transmission reference tariffs (**tariffs**) for the AA5 period.

This TSS is accompanied by a separate technical summary, which provides further detail in relation to Western Power's proposed approach to setting tariffs throughout the AA5 period.

Our tariffs make up 45 per cent of the average electricity bill, as illustrated in Figure 1.1 below.

Figure 1.1: Western Power's role as distribution and transmission service provider



The ERA approves the total revenue that we expect to recover from our retailer and large transmission connected customers, and we then set tariffs that enable us to recover that revenue.

Electricity users consuming less than 50MWh per annum, which include residential and small to medium sized business connections, are subject to separate regulated retails tariffs which are set by the Western Australian Government annually.

As a responsible provider of network services we design our tariffs to:

- meet the pricing principles in the Code,[1] in particular how the approved target revenue is shared between different groups of network users;
- recover our target revenue in a way that minimises our future costs and supports the transition to renewable sources of energy, for example through facilitating the uptake and efficient operation of distributed energy resources (**DER**); and
- provide price signals to encourage user behaviour that drives the efficient use of the network and promotes equity.

The commencement of AA5 is delayed until 1 July 2023. The methodology set out in the TSS will therefore apply from the second year of AA5 (FY24). As published in the ERA's framework and approach,[2] Western Power's current price list will apply until the revised access arrangement comes into effect.

1.1 A new efficiency-based framework for reference tariffs

The changes to the Code also require us to apply a new framework for tariffs that is explicitly modelled on changes introduced in 2014 to the National Electricity Rules (**NER**), which apply to the Australian electricity market outside of Western Australia.

The Code pricing objective is that, subject to certain requirements, reference tariffs:[3]

> *…should reflect the service provider's [Western Power's] efficient costs of providing those reference services.*

The achievement of this objective is guided by a range of pricing principles,[4] which in turn reflect widely accepted economic principles of pricing, along with other important considerations.

A key role of the pricing principles – in both the Code and the NER – is to guide the tension that arises between:

- the characteristics of strictly efficient reference tariffs; and
- end-user related considerations, such as their preferences and ability to interpret potentially complex tariff structures.

We have engaged closely with users and end-use customers throughout the development of our TSS to balance these considerations and incorporate their feedback. Western Power is deeply grateful for the feedback we received from users and end-use customers throughout the development of our TSS.

1.2 How do tariffs promote economic efficiency?

Our reference tariffs promote economic efficiency by signalling to end-users the future network costs that can be avoided through their decisions. Economic efficiency is focused squarely on future costs because it is only future network costs that can be avoided.

> The objective of network pricing is economic efficiency. It is achieved by sending price signals that are based on future network costs.

Signalling to end-users our future network costs will:

- encourage end-users to use our network more when it does not increase our costs;

[1] Electricity Networks Access Code, clauses 7.3D to 7.3J.
[2] ERA, *Framework and approach for Western Power's fifth access arrangement review – Final decision*, 9 August 2021, p 38.
[3] Electricity Networks Access Code, clause 7.3.
[4] Electricity Networks Access Code, clauses 7.3D to 7.3J.

- empower end-users to decide whether an installation behind their meter (eg, solar panels, storage or more efficient appliances), participation in community battery schemes or some other change in their behaviour will better meet their energy needs, or the needs of other end-users, at a lower cost;
- promote the role of our network as a platform for sharing and accessing electricity, while meeting end-users' evolving needs;
- promote fairness between adopters and non-adopters of new technologies; and
- indicate to Western Power the areas where end-users value further investment in network capacity or capability, ie, where there is not a lower cost non-network solution.

We explain how our tariffs achieve these outcomes in more detail in section 4.

Achieving these outcomes through efficient tariffs has never been more important than now, reflecting that:

- end-users have more control over their electricity use, sources and bills than ever before;
- the way end-users use our network is changing, as they support the transition to renewable energy by adopting DER;
- in turn, the drivers of our future efficient costs are changing; and
- the services and technology mix that will best meet end-users' needs in the future, and the dynamics that will arise between new technologies, are not fully known.

It is therefore imperative that our tariffs reflect our role as a network service provider, while also best meeting end-users' evolving needs and facilitating government's evolving renewable energy policy.

This promotes equity and fairness by empowering all end-users to take control of their network bills and to play a role in reducing our network costs, irrespective of what technology is behind their electricity meter.

Having administered the very similar requirements in the NER since 2014, the Australian Energy Regulator (**AER**) similarly concluded that:[5]

> *Future network tariffs should further enhance opportunities for consumers to optimise their own consumption and asset use, while getting the most out of shared network assets financed by all consumers. They should also be technologically neutral, simply signalling the costs (and benefits) arising from serving the consumers' use of the network.*

1.3 Key changes to our reference tariffs in AA5

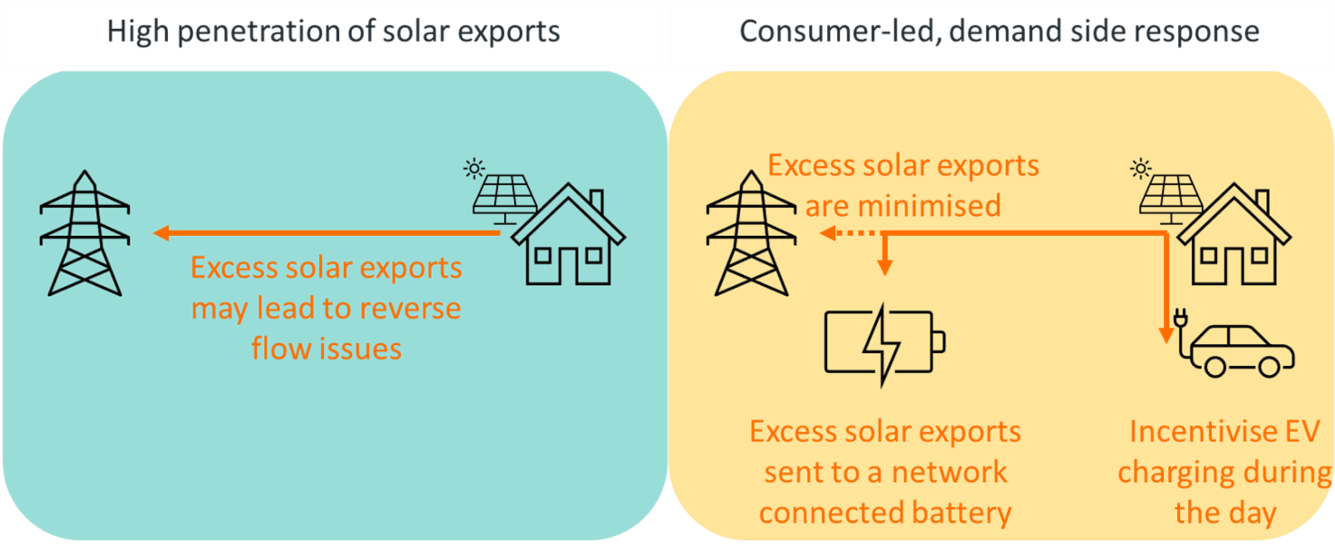
The principal focus of our tariff proposal is to reflect the ever-increasing role of our network as a platform for sharing and accessing renewable energy, while supporting the evolving needs of our end-users, particularly as they relate to the increasing role of solar PV in the electricity system. We achieve this by using a very low, 'super off-peak' energy price to encourage more use of the network during periods when solar panels are exporting renewable energy to the grid.

This reflects our preference for a consumer-led, demand side response to solar PV, rather than the alternative of using export prices to discourage exports from small-scale solar PV (as is currently being implemented in the National Electricity Market (**NEM**)). We anticipate that this approach will increase the reliability of supply and stability of our network through more active participation and network use by our end-users.

[5] AER, *Final Decision – AusNet Services, CitiPower, Jemena, Powercor, and United Energy Distribution Determination 2021 to 2026 Attachment 19 Tariff structure statement*, April 2021, p 5.

An indicative example of a consumer-led, demand side response to solar PV is presented in Figure 1.2.

Figure 1.2: An indicative example of a consumer-led, demand side response to solar PV



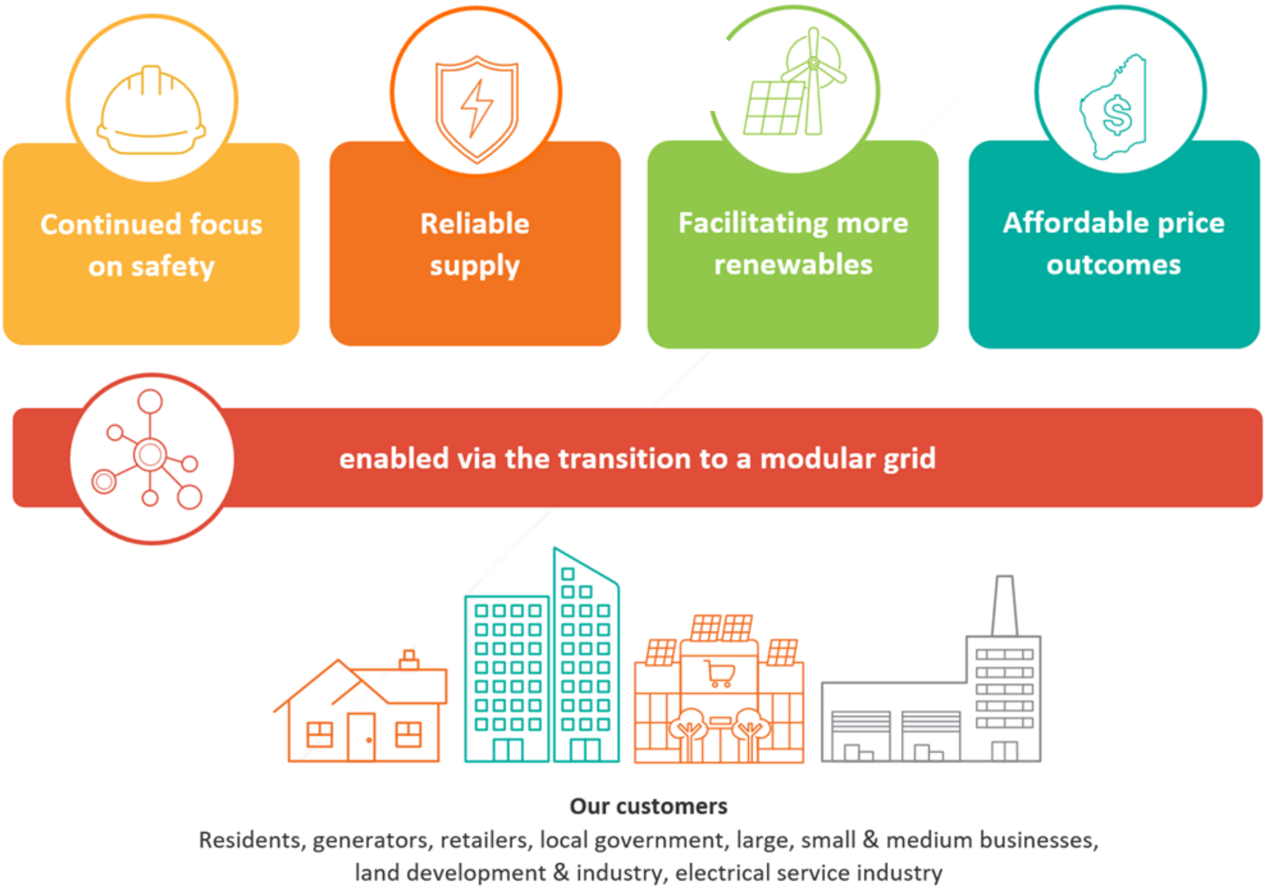
Our other tariff reforms include:

- introducing new super off-peak energy and demand tariffs for residential and small business end-users;
- introducing new reference tariffs for storage that connect directly to our transmission or distribution network;
- introducing a new reference tariff for dedicated electric vehicle (EV) fast-charging stations;
- setting our variable charges at a level that reflects the future cost of using our network at that time;
- aligning the revenue recovered from each reference tariff with the total efficient cost of providing that reference service, while managing end-user bill impacts by limiting increases in our network charges to less than inflation; and
- making these changes gradually to reflect the feedback from our customers and end-users.

We explain our key reforms to our tariff structures in section 3**.**

Tariff reform forms part of our broader strategy for the AA5 period. A summary of our strategic direction for AA5 is provided in Figure 1.3.

Figure 1.3: Overview of broad strategic direction for AA5



1.4 The structure of our TSS

We have structured our TSS to provide clear and intuitive information for our users and end-users, with technical information confined to a separate technical summary that accompanies this TSS overview.

We summarise the structure of our TSS overview below.

Section	Title	Description
Section 2	Background to our TSS	Explains key background information relevant to our TSS, including the importance of tariff reform and feedback from our customers, end-users and the ERA in its Draft Decision.
Section 3	Our tariff structures	Summarises the definition of the charging components for key reference tariffs (the tariff structure) and introduces our new reference tariffs.
Section 4	How we set prices	Describes the methodology we apply to set the price levels for each reference tariff.
Section 5	Reference tariff change forecast	Presents our indicative forecast of the weighted average annual price change for each reference tariff over the AA5 period.

Our separate, TSS technical summary document contains:

- a description of our estimation process for forward-looking efficient costs;
- an explanation of our methodology for calculating the efficient cost target and allocating target revenue for each reference tariff;
- our approach to estimating stand-alone and avoidable costs as the bounds for revenue recovery of each reference tariff;
- the detailed structure of each reference tariff;
- a summary of the price setting process for transmission connections, including our policy for new transmission nodes;
- our methodology for calculating the reference tariff change forecast; and
- a compliance checklist of the requirements in the Code relating to the TSS.

Unless otherwise stated, all dollar amounts are expressed in dollars of the day, as of 30 June 2022.

2. Context to our TSS

Our TSS applies a new tariff framework that places a greater emphasis on economic efficiency and the role of end-users in the development of our tariffs. We highlight below why these changes are imperative at this stage of the transition to renewable sources of energy.

Most residential and small to medium sized business customers are assigned to a network tariff and service by a user or their retailer, rather than Western Power. Further, the extent to which our efficient tariff structures are passed through to end users is at the retailer's discretion. The effectiveness of our tariff reform therefore significantly depends on the assignment of customers to efficient tariffs by their retailer, as well as retailers passing those efficient tariff structures through to end users.

We design our network tariffs with the intent that they provide the right pricing signals and encourage the right consumptive behavioural patterns from end-use customers in order to: drive the efficient use of; and ensure equitable participation in, the SWIS network.

2.1 Customers are changing the way they use our network

The current and expected future rate of change in the electricity market is without precedent. These changes are driven by:

- a societal focus on the adoption of renewable sources of energy to mitigate the risks associated with climate change;
- a focus on end-use consumer involvement in electricity regulation and decision making; and
- technological changes that enable renewable sources of electricity and DER to compete with traditional, carbon-intensive sources.

Furthermore, end-users have more control over their electricity use and bills than ever before. This reflects, among other things:

- the adoption of advanced meters and our implementation of more efficient time of use tariff structures;
- the falling cost of solar PV and battery technology; and
- the increased availability of smarter and more energy efficient appliances, as well as home energy management systems.

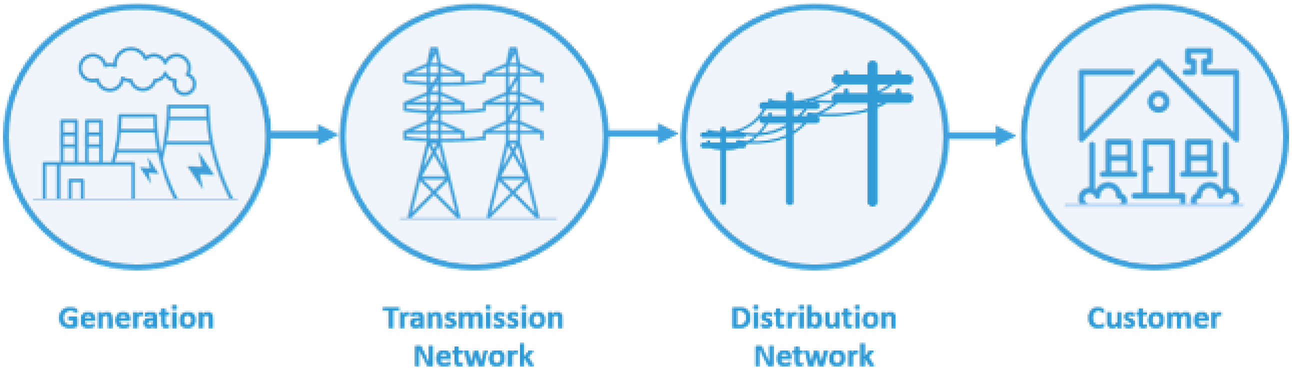
These forces for change are empowering end-users to change the way they use our network. For example, end-users can:

- generate renewable energy to consume or share with other end-users, which can mitigate congestion on other parts of our network and displace non-renewable forms of generation;
- store locally generated energy in a battery for consumption or sharing later, when doing so may be of more value to the end-user, our network and the electricity system; and
- co-ordinate appliances and DER to minimise their electricity bills.

These accelerating trends are changing Western Power's role in the electricity system. Our role is shifting towards a platform for new technologies, energy sharing and consumer choice whereas, in contrast, our historical role was facilitating the one-way transportation of electricity to end-users.

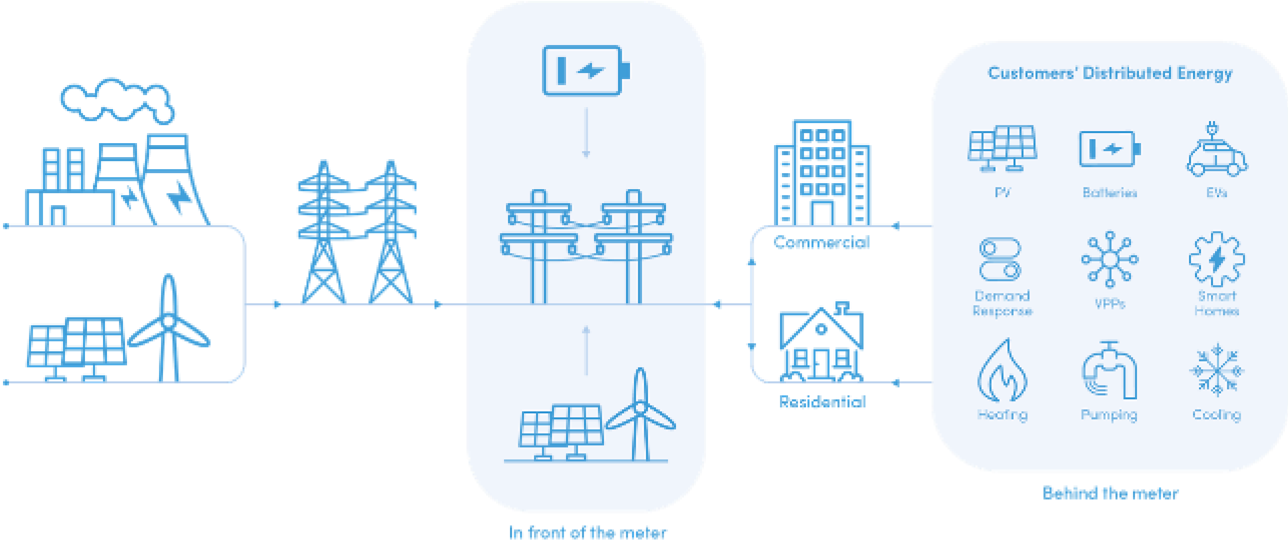
Figure 2.1 and Figure 2.2 illustrate the distinction between our historical and current/future role in the electricity supply chain.

Figure 2.1: Historical electricity supply chain



Source: EPWA, Energy Transformation Strategy.

Figure 2.2: Current and future electricity supply chain



Source: EPWA, Energy Transformation Strategy.

2.2 The drivers of our network costs are changing

Historically, the one-way transportation of electricity to end-users meant that peak demand was the traditional, primary driver of network costs, that is, additional costs were caused by end-users using the network in the same way, at the same time, in the same place.

More recently, the high penetration of solar PV installations has meant that end-users now share local generation by exporting energy into our network for other end-users to consume. When other parts of the network are constrained, end-user's exports can avoid network costs by freeing up network capacity elsewhere, thereby avoiding the need to expand the network.

These network benefits do not arise when end-user exports coincide with periods of low demand. However, because of the broader, non-network benefits of solar PV, we want to encourage end-users to export electricity when we have spare capacity to facilitate those exports.

The challenge inherent in this objective is that solar irradiance is highest during the middle of the day, when demand typically is low.

The resulting imbalance between supply and demand at these times can:

- increase the voltage on the network and lead to voltage management and system security challenges; and/or
- reverse the flow of energy at particular assets (substations), which lead to technical and operational challenges.

Managing these contemporary network challenges increases our costs. In extreme cases, these costs can lead to the curtailment of an end-user's ability to share electricity. This is inefficient if the benefit of sharing local generation exceeds the network costs that is causes. It follows that, as end-users change the way they use our network, so too are the drivers of our costs changing.

End-user decisions that can increase our costs include:

- withdrawing (or importing) electricity from our network when demand is very high (peak demand events); and
- injecting (or exporting) electricity when demand is very low and exports are high (low load events).

Customers are changing the way they use our network, which presents an opportunity to use tariff to promote decisions by consumers that lower our network costs.

Importantly, there are now also a wider range of end-user decisions that can help to lower our costs, such as:

- withdrawing electricity during low load events;
- storing local generation during low load events;
- injecting electricity during peak demand events; and
- using stored energy during peak demand events.

We therefore want to encourage end-users to make decisions that unlock value for them and lower our network costs, which benefits all network users because it reduces our approved revenue target in future years.

Encouraging customers to shift their load to the middle of the day, when solar PV exports are highest and residential demand is lowest, is the principal way that we will achieve this outcome in AA5. We will encourage end-users to shift their load to the middle of the day by including in new tariffs with a super off-peak period with a very low price on imports (see section 3).

2.3 A technology neutral approach

There is at present uncertainty as to how the electricity system, in aggregate, can be structured to best meet our end-users' evolving future needs.

By way of example, a key driver of uncertainty for residential end-users is the development, uptake and operation of new technologies, and the dynamics that will arise between those technologies, such as between solar PV, storage, EVs, home energy management systems and controlled load.

Due to this uncertainty, it is imperative that our reference tariffs reflect our role as a platform for sharing and accessing electricity, while also best meeting end-users' evolving future needs.

This necessitates a technology neutral approach to tariffs, where we signal to end-users the network benefits and costs that arise from their decisions, irrespective of which technology is leading to those network benefits or costs.

This is consistent with the approach adopted in the NEM. The AER has recently stated that:[6]

> *Future network tariffs should further enhance opportunities for consumers to optimise their own consumption and asset use, while getting the most out of shared network assets financed by all consumers. They should also be technologically neutral, simply signalling the costs (and benefits) arising from serving the consumers' use of the network.*

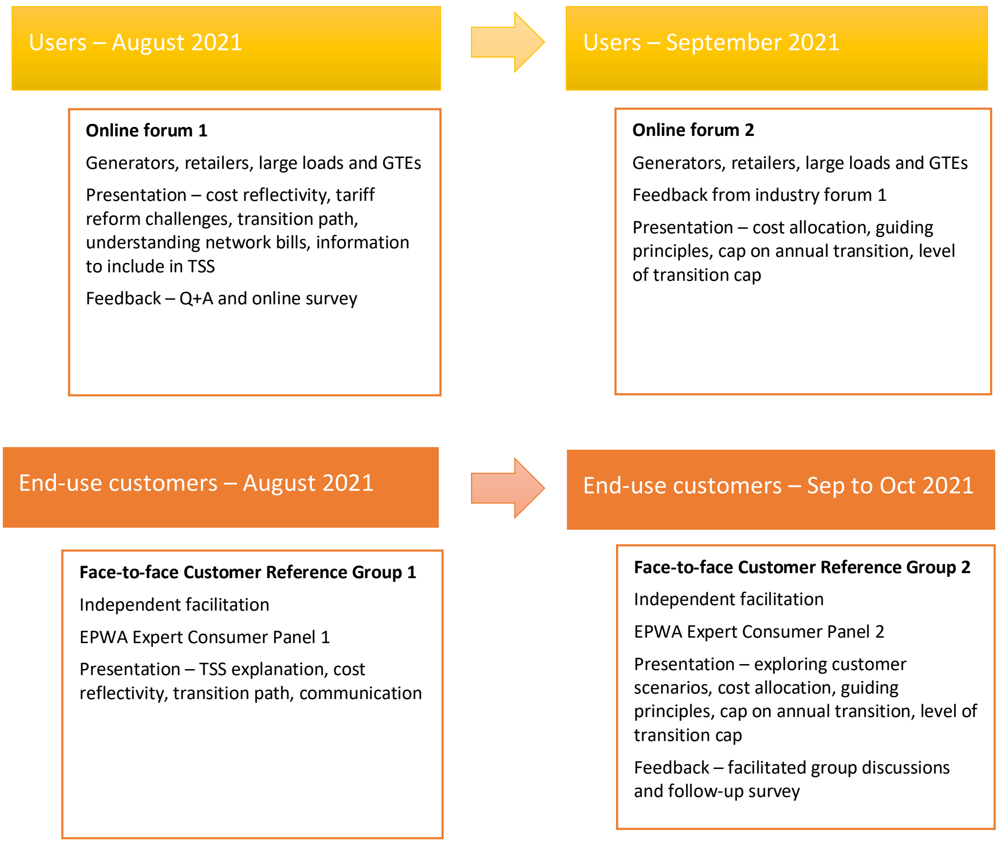
There may be temporary exceptions to the principle of technological neutrality during the early stages of the energy market transformation to support the early adoption of new technologies (such as EVs and fast-charging stations) to mitigate uncertainty around new business models (such as for grid-connected storage) and/or to fast-track the implementation of efficient tariffs for certain end-users.

Therefore, in line with the ERA's final decision on the framework and approach and its Draft Decision, we have developed specific tariffs for grid-connected storage and dedicated electric vehicle fast-chargers.[7]

2.4 Early feedback from our users and end-use customers

We conducted consultation with our users and end-use customers in the preparation of our initial TSS and the feedback we received played a central role in our TSS. Stakeholder engagement was designed in two phases to ensure details of the TSS were first explained and the opportunity for feedback provided, before delving into further detail about the possible applications of the TSS.

Figure 2.3: Consultation with users and end-use customers



[6] AER, *Final Decision – AusNet Services, CitiPower, Jemena, Powercor, and United Energy Distribution Determination 2021 to 2026 Attachment 19 Tariff structure statement*, April 2021, p 5.

[7] ERA, *Framework and approach for Western Power's fifth access arrangement review – Final decision*, 9 August 2021, p 20.

Our users and end-use customers told us the matters that are most important to them and these are outlined in Table 2.1.

Table 2.1: What our users and end-use customers told us and how we responded in our initial TSS

Key theme	What our users and end-use customers told us	How we responded
Efficiency	Users and end-use customers recognise the advantages of more efficient tariffs, particularly as they relate to transitioning to renewable sources of generation, and support efficiency-based tariff reform.	• New tariff structures that encourage solar soaking[8] to facilitate more generation from solar PV. • Not introducing export charges. • Signalling our future costs to customers through variable charges.
Transition	It is important to manage the effects of tariff reform on customers in a fair and equitable way.	• We are grandfathering a number of pre-existing time of use reference tariffs by transitioning variable charges upwards to encourage our more efficient time of use reference tariffs or the flat energy tariff. • Consistency of fixed charges across all residential reference tariffs. • We are transitioning our allocation of costs to reference tariffs slowly, since these changes do not improve efficiency and can have material effects on customer's network bills. • More efficient tariffs ensure that customer bills are based on the costs and benefits they provide the network.
Clarity	Users and end-use customers would like to understand how their tariffs are set, the reasons why they might be changing and how those changes support a transition to renewable energy.	• Our TSS provides transparent information to users and end-use customers on how we set tariffs, with more technical information included in appendices for interested parties.

Our adoption of a transition to more efficient tariffs balances the tension that arises between the efficiency-based requirements of pricing principles 7.3G and 7.3H and the requirement to accommodate the reasonable requirements of users and end-use customers in pricing principle 7.3F under the Access Code.[9]

2.5 Feedback on our initial TSS

We received a range of helpful feedback on our initial TSS from the ERA and stakeholders and on the additional information we provided thereafter. We continued our engagement throughout the

[8] Solar soaking is when consumers use more solar power in their home than they export to the grid.
[9] In other words, compliance with clause 7.3F necessitates a slight departure from clauses 7.3G and 7.3H during our transition to more efficient tariffs. This is consistent with the approach adopted in the NEM.

development of our revised TSS and summarise the key feedback we received, and our responses, in Table 2.2.

Table 2.2: Summary of key feedback on our initial TSS and how we responded

	Feedback	How we have responded in this TSS	Relevant sections of the TSS
Super off-peak demand tariffs	We received feedback to include a demand-based version of our super off-peak energy tariffs for residential and small business customers.[10]	We have developed super off-peak demand tariffs for small business (RT36) and residential (RT37) customers, which sit alongside our super off-peak energy tariffs for those customers.	Overview, section 3.2.
Tariffs for EV charging stations	Customers indicated that the demand charges in the initial EV tariff may render EV charging stations uneconomic during the initial uptake of EVs, when utilisation is low.[11]	We engaged with customers to develop a sliding scale of demand and energy charges that increase with the level of utilisation. We have adopted a measure of utilisation that was very favourable to EV charging stations.	Overview, section 3.4
Tariffs for Storage services	Some retailers requested the provision of export rewards or no export charges, and that storage services have access to a range of tariff options.[12]	We have structured our distribution storage tariffs to reflect our super off-peak energy structure and minimise export charges outside of the super off-peak period. We have restructured our transmission-connected storage tariff to reflect the more favourable structure that applies to transmission-connected generators. Storage customers can enter separate agreements to provide network support.	Overview, section 3.3
Update prices and present bill impact analyses	Customers asked us to update our indicative prices based on the most recent revenue, customer numbers and volume forecasts.[13]	We have derived an updated forecast of the forecast weighted average price change and included a new section with detailed customer bill impacts.	Overview, section 5

[10] See also: ERA, *Draft decision on proposed revisions to the access arrangement for the Western Power Network 2022/23 – 2026/27*, September 2022, p 9.

[11] See also: ERA, *Draft decision on proposed revisions to the access arrangement for the Western Power Network 2022/23 – 2026/27*, September 2022, p 10.

[12] See also: ERA, *Draft decision on proposed revisions to the access arrangement for the Western Power Network 2022/23 – 2026/27*, September 2022, p 11.

[13] See also: ERA, *Draft decision on proposed revisions to the access arrangement for the Western Power Network 2022/23 – 2026/27*, September 2022, p 7.

	Feedback	How we have responded in this TSS	Relevant sections of the TSS
Fixed charges	Customers suggested that increases in fixed charges were out of balance with community expectations on equitable access to essential services, eg, through their effects on low energy users.[14]	We have moderated the extent of rebalancing over the AA5 period so that the increase in residential fixed charges is no more than two per cent above the weighted average change in revenue to be recovered from distribution reference services each year.	Overview, section 5
Cost allocation methodology	In its Draft Decision the ERA requested that we provide more detailed information on the application of our cost allocation methodology.[15]	We have provided additional information how we propose to allocate costs by transitioning to more efficient allocations, while managing customer bill impacts. We also include more information on the indictive results of our methodology.	Technical Summary, section 4

[14] See also: ERA, *Draft decision on proposed revisions to the access arrangement for the Western Power Network 2022/23 – 2026/27*, September 2022, pp 7-9.

[15] ERA, *Draft decision on proposed revisions to the access arrangement for the Western Power Network 2022/23 – 2026/27*, September 2022, p 7.

3. Our tariff structures

The 'structure' of a tariff refers to the design of its charging components. This includes:

- the form of the charging components: fixed charges, variable energy charges, variable demand charges and/or capacity-based charging components; and
- the particular specification of those charging components, such as whether or not different variable charges apply at different times of the day.

We explain the structure of each of our reference tariffs in detail in section 5 of the accompanying technical summary.

Most of our end-users are on a tariff that comprises:

- a fixed use of system charge and a fixed metering charge; and
- one or more variable charges, calculated by reference to a measure of their:
  - energy use, ie, the volume of energy they transport through the network; and/or
  - maximum demand, ie, the maximum rate at which they transport energy through the network.

The concepts of demand and energy have parallels with a household water tap, where the rate of flow through a tap is akin to maximum demand and the volume of water that goes through the tap is akin to energy use.

A tariff structure that incorporates a 'time of use' dimension applies different prices at different times of the day. The principal benefit of time of use tariff structures is that they signal to end-users how the future costs caused by their energy use change throughout the day, which encourages them to shift their use to when it does not increase our network costs.

Importantly, this is typically during the day when renewable sources of energy are more prevalent.

We explain key changes to our tariff structures in the remainder of this section, ie, our:

- four new super-off peak tariffs for residential and small business customers – RT34 to RT37;
- three new tariff for distribution and transmission connected storage – RT38, RT39 and TRT3; and
- two new tariffs for dedicated EV charging stations connected to the distribution network – RT40 and RT41.

3.1 Tariff structures

The following table details which reference tariff is applicable to each of the reference services.

Table 3.1: Reference services and applicable tariffs

Reference service	Reference tariff
A1 – Anytime Energy (Residential) Exit Service	RT1
A2 – Anytime Energy (Business) Exit Service	RT2
A3 – Time of Use Energy (Residential) Exit Service	RT3
A4 – Time of Use Energy (Business) Exit Service	RT4

Reference service	Reference tariff
A5 – High Voltage Metered Demand Exit Service C5 – High Voltage Metered Demand Bi-directional Service	RT5
A6 – Low Voltage Metered Demand Exit Service C6 – Low Voltage Metered Demand Bi-directional Service	RT6
A7 – High Voltage Contract Maximum Demand Exit Service C7 – High Voltage Contract Maximum Demand Bi-directional Service	RT7
A8 – Low Voltage Contract Maximum Demand Exit Service C8 – Low Voltage Contract Maximum Demand Bi-directional Service	RT8
A9 – Streetlighting Exit Service	RT9
A10 – Unmetered Supplies Exit Service	RT10
A11 – Transmission Exit Service	TRT1
B1 – Distribution Entry Service	RT11
B2 – Transmission Entry Service	TRT2
B3 – Entry Service Facilitating a Distributed Generation or Other Non-NetworkSolution	RT23
C1 – Anytime Energy (Residential) Bi-directional Service	RT13
C2 – Anytime Energy (Business) Bi-directional Service	RT14
C3 – Time of Use (Residential) Bi-directional Service	RT15
C4 – Time of Use (Business) Bi-directional Service	RT16
A12 – 3 Part Time of Use Energy (Residential) Exit Service C9 – 3 Part Time of Use Energy (Residential) Bi-directional Service	RT17
A13 – 3 Part Time of Use Energy (Business) Exit Service C10 – 3 Part Time of Use Energy (Business) Bi-directional Service	RT18
A14 – 3 Part Time of Use Demand (Residential) Exit Service C11 – 3 Part Time of Use Demand (Residential) Bi-directional Service	RT19
A15 – 3 Part Time of Use Demand (Business) Exit Service C12 – 3 Part Time of Use Demand (Business) Bi-directional Service	RT20
A16 – Multi Part Time of Use Energy (Residential) Exit Service C13 – Multi Part Time of Use Energy (Residential) Bi-directional Service	RT21
A17 – Multi Part Time of Use Energy (Business) Exit Service C14 – Multi Part Time of Use Energy (Business) Bi-directional Service	RT22
C15 – Bi-directional Service Facilitating a Distributed Generation or Other Non-Network Solution	RT24

Reference service	Reference tariff
D1 – Supply Abolishment Service	RT25
D2 – Capacity Allocation Service	NA[16]
D6 – Remote Load / Inverter Control Service	RT26
D8 – Remote De-energise Service	RT28
D9 – Remote Re-energise Service	RT29
D10 – Streetlight LED Replacement Service	RT30
D11 – Site Visit to Support Remote Re-energise Service	RT31
D12 – Manual De-energise Service	RT32
D13 – Manual Re-energise Service	RT33
A19 – Super Off-peak Energy (Business) Exit Service C17 – Super Off-peak Energy (Business) Bi-directional Service	RT34
A18 – Super Off-peak Energy (Residential) Exit Service C16 – Super Off-peak Energy (Residential) Exit Service	RT35
A21 – Super Off-peak Demand (Business) Exit Service C19 – Super Off-peak Demand (Business) Bi-directional Service	RT36
A20 – Super Off-peak Demand (Residential) Exit Service C18 – Super Off-peak Demand (Residential) Bi-directional Service	RT37
C22 – Transmission Storage Service	TRT3
C23 – Low Voltage Distribution Storage Service	RT38
C24 – High Voltage Distribution Storage Service	RT39
A22 – Low Voltage Electric Vehicle Charging Exit Service C20 – Low Voltage Electric Vehicle Charging CMD Service	RT40
A23 – High Voltage Electric Vehicle Charging Exit Service C21 – High Voltage Electric Vehicle Charging CMD Service	RT41

3.2 New residential and small business tariffs with a super off-peak period

We propose to introduce four new super off-peak tariffs for residential and small business customers using either an exit or bi-directional reference service in AA5.

We present in Table 3.2 the tariff codes for the time of use energy and demand versions of our new super off-peak services for residential and business customers. We explain the structure of these tariffs in detail in section 6 of the technical summary.

[16] Applicable Reference Tariff: Any applicable lodgement fees payable in accordance with the Applications and Queuing Policy.

Table 3.2: Super off-peak reference tariffs for residential and business customers

	Business code (Exit and bi-directional service)	**Residential code** (Exit and bi-directional service)
Time of use energy	RT34	RT35
Demand	RT36	RT37

We summarise the structure of these tariffs in Table 3.3.

Table 3.3: Structure of super off-peak reference tariffs for residential and business customers

	Business and residential energy tariffs (RT34 and RT35)	Business and residential demand tariffs (RT36 and RT37)
Fixed use of system charge	✓	✓
Fixed metering charge	✓	✓
On-peak demand *3pm-9pm daily*	N/A	✓
On-peak energy *3pm-9pm daily*	✓	✓
Shoulder energy *6am-9am and 9pm-11pm daily*	✓	✓
Off-peak energy *11pm-6am daily*	✓	✓
Super off-peak energy *9am-3pm daily*	✓	✓

Each of these tariffs has a super off-peak period each day between 9am and 3pm with a variable energy price that is significantly lower than our other variable energy charges. This very low price is aimed to encourage end-users to shift load to times when supply significantly exceeds demand on our network.

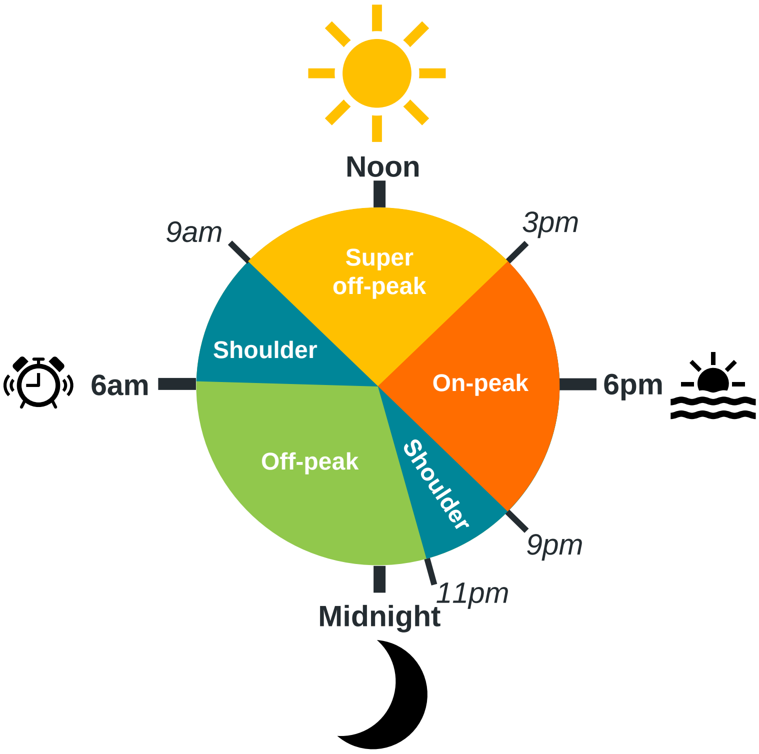
These tariffs are designed to enable a consumer-led, demand-side solution to address the changing drivers of our network costs.

Our view is that, at this stage in the energy market transformation, we should endeavour first to address the future costs caused by low load events through a consumer-led, demand side solution.[17] This solution is preferable in the first instance to the alternative of using some form of export price to discourage supply from small-scale solar PV.

Further, a super off-peak period empowers all end-users to play a role in increasing the use of renewable energy on our network, not just those customers who can afford to make investments in DER.

We illustrate the definition of our charging windows for these tariffs in Figure 3.1.

Figure 3.1: Charging windows for new residential and small business tariffs

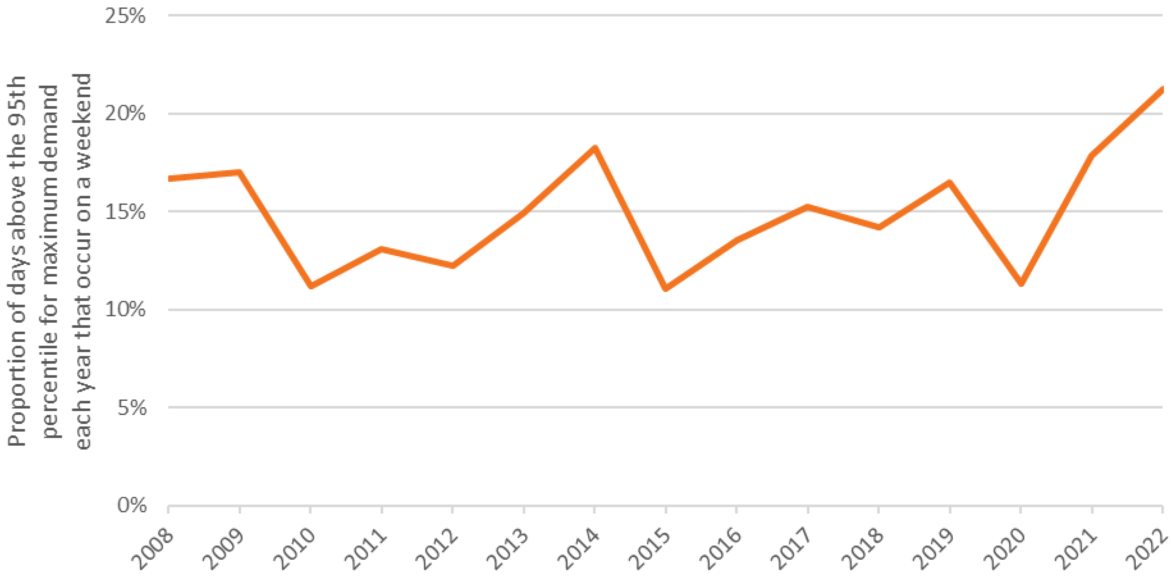


The on-peak charging window for current time of use reference tariffs only apply during weekdays, however as seen in Figure 3.2, there has been an increase in the number of very high demand days on weekends in recent years.[18] This indicates that the charging windows intended to signal efficient network use should apply on all days of the week. We have therefore defined the charging windows in our new time of use reference tariffs over both weekdays and weekends.

[17] A 'low load event', or 'minimum system load' is where energy demand is low, but rooftop solar PV continues to push electricity into the network, displacing large synchronous generating units (coal, gas, and hydro) that are required to be on to provide essential system services.

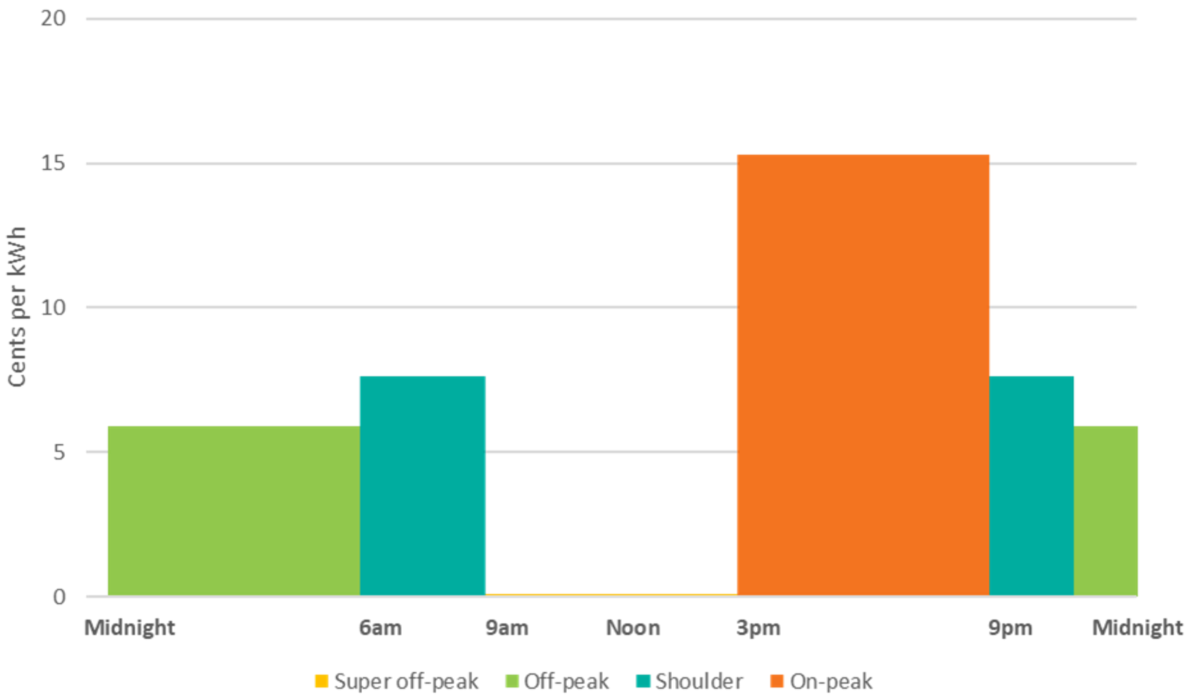
[18] We define a 'very high demand day' as the top five per cent of maximum daily demand each year at each zone substations.

Figure 3.2: Proportion of very high demand days that occur on the weekend



To provide a broad indication of the relativities between the various prices that comprise super off-peak tariffs, we illustrate indicative prices for our Super Off-peak Energy (Residential) Exits Service tariff in Figure 3.3.

Figure 3.3: Indicative variable prices for super off-peak energy (residential) tariff



One consequence of recovering much less of our costs in the middle of the day – due to a near-zero super off-peak price – is that the off-peak, shoulder, and on-peak prices are slightly higher, when compared to similar tariffs that do not have a super off-peak period.

This is to ensure that we still recover our total efficient cost of providing services to end-users on our super off-peak tariffs. In addition to promoting the equitable treatment of end-users on super off-peak and non-super off-peak tariffs, it assists in retaining a sufficiently strong price differential between the super off-peak period and other variable prices.[19] It also avoids the need for further increases in fixed charges.

We will continue providing end-users with our existing time of use or demand reference services, with their existing charging windows, if:

- the services were provided at the relevant connection points at the date the AA5 period takes effect; and
- those services continue from the AA5 period effective date.

From year two of the AA5 period, the current (or transitional) time of use and demand services will be closed for new customer nominations. Existing end-users on these time of use or demand services will transition over time to the new time of use or demand services and tariffs (as discussed above) as end-users transition to alternative reference services.

We also include super off-peak periods in our new tariffs for storage connected to the distribution network, as discussed below.

3.3 New tariffs for grid-connected storage

Grid-connected storage can play a key role in the energy market transformation, since they can provide a range of services to the wholesale market and assist in avoiding network costs, eg, by:

- exporting during periods of peak demand; and
- importing during periods of peak exports.

We have introduced three new tariffs specifically for grid-connected storage so that they face incentives to operate efficiently on our network, ie:

- a distribution storage service tariffs for low voltage connections – RT38;
- a distribution storage service tariffs for high voltage connections – RT39; and
- a transmission storage service tariff – TRT3.

> Grid-connected storage can provide a range of services to the market and assist in avoiding network costs. Cost reflective tariffs play a key role in aligning the commercial incentives of the battery with the needs of the network.

It is important to recognise that efficiency is promoted by a battery (or any end-user) providing the service that is most highly valued by the electricity supply chain, which may not necessarily be network services.

The role of our tariffs is therefore to provide a battery with a price signal that reflects the additional costs imposed on our network at different times, so that it can decide whether the provision of network services or other services will produce the highest net benefit to the electricity market, ie, after accounting for all additional costs.

The potential for grid-connected storage to provide non-network services also means that the battery owners should contribute to the cost of maintaining and operating our network, just as other business end-users do.

[19] Western Power, *Feedback on issue paper – Framework and approach for Western Power's fifth access arrangement review*, May 2021, p 15.

3.3.1 Distribution connected storage services

In response to user and end-use customer feedback on our initial TSS, we have agreed to depart from our preferred technology-neutral approach to network tariffs for distribution-connected storage services that we put forward in our initial TSS.

We have therefore developed bespoke tariff structures for our two distribution-connected storage services, ie:

- a distribution storage service tariffs for low voltage connections – RT38; and
- a distribution storage service tariffs for high voltage connections – RT39.

We summarise the structure of these tariffs in Table 3.4.

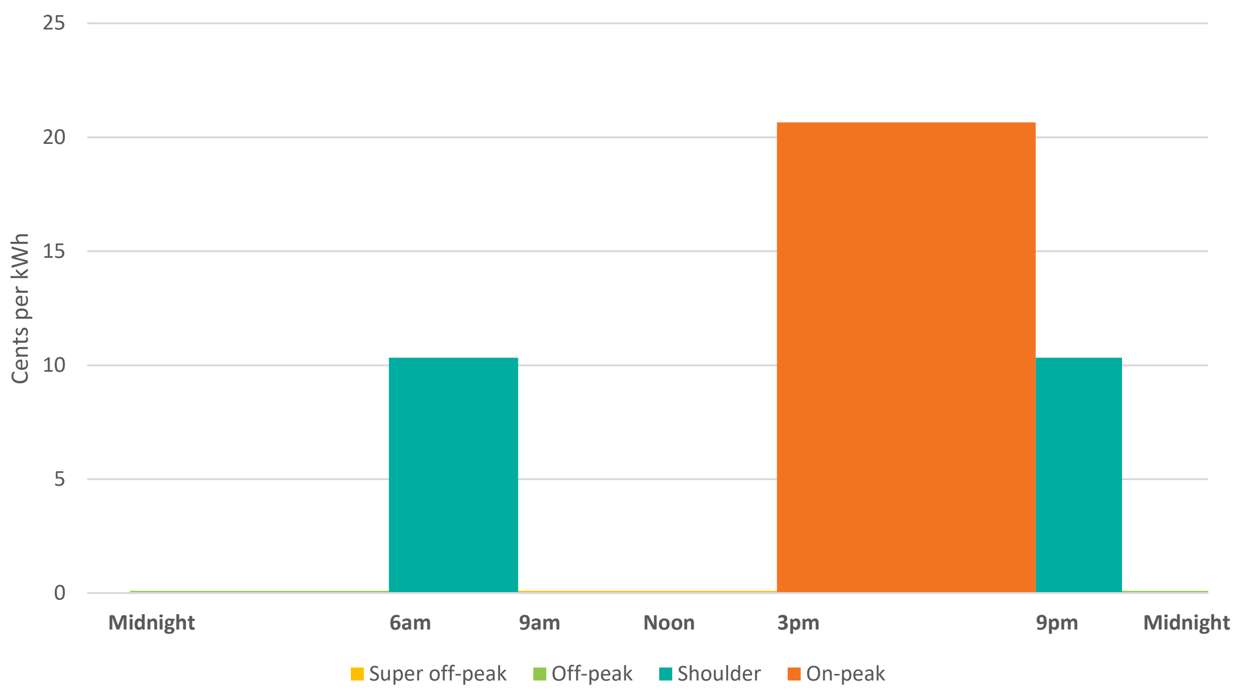
Table 3.4: Structure of distribution storage service tariffs for low and high voltage customers

	Low voltage distribution storage service tariff (RT38)	High voltage distribution storage service tariff (RT39)
Fixed use of system charge	✓ *Increases with the size of installed storage capacity*	✓ *Increases with the size of installed storage capacity*
Fixed metering charge	✓	✓
On-peak demand *3pm-9pm daily*	N/A	N/A
On-peak energy *3pm-9pm daily*	✓	✓
Shoulder energy *6am-9am and 9pm-11pm daily*	✓	✓
Off-peak energy *11pm-6am daily*	✓	✓
Super off-peak energy *9am-3pm daily*	✓	✓
Solar soak export charge *9am-3pm daily*	✓ *With a lower price applied to the first 3kWh and a higher price for exports above 3kWh.*	✓ *With a lower price applied to the first 3kWh and a higher price for exports above 3kWh.*
Off-peak export charge *12am-9am and 3pm-12am daily*	✓ *Near zero*	✓ *Near zero*

Each our two distribution connected storage tariffs have the same charging windows that are applied to our super off-peak tariffs. Specifically, our distribution-connected battery tariffs have the same structure as our super off-peak time of use energy tariffs.

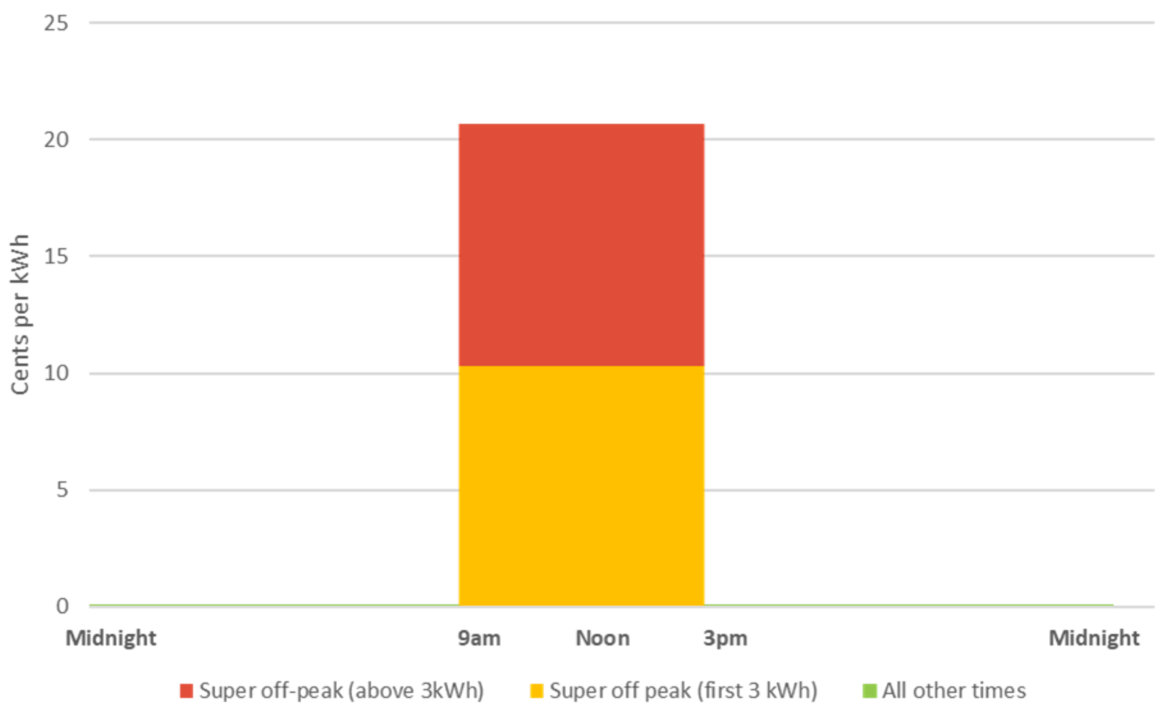
To provide an indication as to the relativities between the variable import prices that apply in these charging windows, we illustrate indicative prices for our low voltage distribution storage service tariff (RT38) in Figure 3.4.

Figure 3.4: Indicative variable import prices for low voltage storage tariff



To provide a broad indication as to the magnitude of the export prices we will apply in these charging windows, we illustrate indicative export prices for our low voltage distribution storage service tariff (RT38) below.

Figure 3.5: Indicative export prices for low voltage storage tariff



Note: For the avoidance of doubt, the export price that applies to all exports above 3kWh in this indicative example is just above 20 cents per kWh, ie, not the difference between that amount and 10 cents per kWh (which applies to the first 3kWh of exports).

We apply the same approach for the high voltage distribution connected storage tariff.

We have not included default rewards for distribution connected storage services that export energy during the evening peak, as requested by Synergy. This is because of the very low level of avoidable costs in the evening peak period, as reflected in our very low estimate of long run marginal cost (**LRMC**) - see section 4.1. The conversion of our import LRMC into a peak export reward would result in a reward of only $0.01 per kWh for exports during the on-peak period.[20]

In our view the provision of an export reward of this magnitude is unlikely to precipitate a change in a distribution-connected battery's behaviour, which is the objective of any export reward, and will outweigh the transaction costs of implementing such an arrangement.

In our opinion, a significantly more efficient outcome is for distribution connected storage to enter a separate network support arrangement with Western Power where they connect to a particular part of our distribution network where material costs that can be avoided by exporting at a certain time of the day. Network support arrangements will also enable us to provide more-efficient rewards, ie, that reflect the particular level and timing of benefits from additional exports in a given part of our network.

A detailed description of the structure of our two distribution-connected storage service tariffs is contained in section 6 of the technical summary that accompanies this TSS overview.

3.3.2 Transmission connected storage services

Following feedback on our initial TSS, we developed and engaged with stakeholders on a revised tariff structure for transmission connected storage that is similar to the tariff applying to transmission-connected generators (rather than transmission-connected loads).

Our tariff for transmission-connected storage therefore comprises multiple, location specific and cost-reflective prices, and is individually calculated for each connection.

It consists of:

- a fixed, daily charge for use of our network that reflects the costs of providing connection assets;
- a fixed, daily metering charge per meter;
- variable charges that apply to the declared sent out capacity (DSOC) of the individual connection, which reflects their use of system and use of control system services; and
- excess network usage charge (ENUC) calculated in accordance with our ENUC principles for transmission connections.

This tariff structure is distinct from that applying to distribution-connected storage because of the fundamentally different circumstances that apply on our transmission network, ie:

- low load events do not occur on our transmission-network, such that additional imports in the middle of the day do not avoid future network costs, which negates the need for a solar soak period; and
- transmission-connected generators are connected upstream from the distribution assets that can become constrained during times of peak demand.

The absence of the various charging windows that apply to distribution-connected storage also provide more flexibility for transmission-connected storage providers to enter contracts with AEMO to provide essential system services and to respond freely to those wholesale market signals.

[20] Calculated equal to $22.7 per kW per annum divided by 2,190, being the number of hours in the peak period each year.

Against this backdrop, Western Power encourages transmission-connected storage service providers to provide network support services in accordance with the Wholesale Electricity Market (WEM) Rules for any non co-optimised essential system services (NCESS).

Western Power also has obligations under the WEM Rules with respect to the NCESS framework, where either the Transmission Network Plan or Network Opportunities Map identify opportunities for proponents to offer non-network solutions. Where a non-network solution results in the least cost solution to address a network need under the NCESS, Western Power can enter into a Network Support Services contract with the non-network solution provider. Storage proponents are encouraged to follow these annual publications (around 1 October each year) and any subsequent EOI processes for specific opportunities to address network constraints and/or needs.

Consistency with approach in the National Electricity Market

Our approach for transmission-connected storage is consistent with the Australian Energy Market Commission's (**AEMC**) final decision on integrating storage in the NEM, which did not exempt transmission-connected storage from transmission charges. The AEMC concluded that:[21]

> *…a change to the current framework that would exempt storage would not promote the NEO [National Electricity Objective] as it would not send storage proponents and operators price signals that reflect:*
>
> - *the efficient cost of providing network services; and*
> - *the benefit storage may have on the network (where a cost-reflective charge may result in storage being paid for the benefits they provide at certain times).*

One key distinction is that in the NEM transmission-connected customers can select whether to use:

- a prescribed transmission service – where a price is set in accordance with the transmission network service provider's (TNSP) approved pricing methodology – which is akin to our reference tariff for transmission-connected storage; or
- a negotiated transmission service, where a customer elects to receive a different service-level and negotiates prices with the transmission network subject to certain negotiation principles – the outworking of which is like providing network support to Western Power.

Our approach to setting the tariff for transmission-connected storage devices is consistent with the Code and results in a tariff that is consistent with the transmission negotiation principles in the NER, which include that the price:[22]

> *…should be based on the costs incurred in providing that service…*
>
> *…must be the same for all Transmission Network Users unless there is a material difference in the costs of providing the negotiated transmission service…*
>
> *…should be at least equal to the avoided cost of providing it but no more than the cost of providing it on a stand-alone basis…*

[21] AEMC, *Rule Determination National Electricity Amendment (Integrating energy storge systems into the NEM)) Rule 2021*, December 2021, p 51-52.
[22] NER, schedule 5.11, Negotiating principles for negotiated transmission services (clause 5.2A.6).

3.4 New tariffs for dedicated electric vehicle charging stations

In line with the ERA's final decision on the framework and approach[23] and its Draft Decision, we are also including two new, technology specific tariffs for dedicated EV charging stations that are intended to support the public charging of EVs in Western Australia. These include:

- a tariff for dedicated EV charging stations connected to the low voltage network – RT40; and
- a tariff for dedicated EV charging stations connected to the high voltage network – RT41.

Sliding scale of variable charges

A key consideration in the design of a tariff applicable to dedicated public EV charging stations is to strike a balance between:

- their potential to cause significant future network costs, due to their very high demand, which has the potential to be exacerbated in a small, isolated electricity network like the SWIS, in comparison to a large integrated electricity network like the NEM; and
- their low utilisation during the initial uptake of EVs, which can inhibit their ability to pay for the additional costs they impose on the network, while also making a fair contribution to the cost of our existing network.

Our initial TSS proposed tariff structures for dedicated EV charging stations that were consistent with our existing metered demand tariffs (RT5 and RT6). We received feedback from stakeholders that those tariffs would make dedicated EV charging stations uneconomic at this stage in the uptake of EVs, namely due to the costs imposed by the demand charges contained therein.

Specifically, stakeholders emphasised that demand charges applied to the highest level of demand measured in the previous 12 months, combined with very high but infrequent load at EV charging stations, gave rise to network charges that were disproportionate to the revenue they derive at this early stage in the uptake of EVs, thereby potentially introducing a disincentive to early adopters of the technology.

In response, we developed and engaged with stakeholders on a revised EV tariff with a sliding scale of variable charges, which increase with the extent to which EV charging stations draw on the network (their network use).

Western Power's view is that a sliding scale of demand charges strikes an appropriate balance between:

- supporting EV charging stations during the initial uptake of EVs, when their utilisation is low; and
- ensuring that EV charging stations make a fair contribution to the recovery of our costs as their utilisation increases, ie, a contribution that is commensurate with that of other end-users that impose similar costs on our network.

During development of the sliding scale to apply to the EV tariff, some stakeholders expressed concern about the early introduction of demand charges as they had the potential to greatly increase network costs while EV numbers and the resultant network draw were low. Some stakeholders suggested that rather than a stepped increase in the demand charges above a threshold, a more gradual increase in these charges for every one or two percentage point increase in the utilisation would result in less risk for retailers and a more equitable outcome. While Western Power understands these concerns, we have not implemented these changes for the following reasons:

[23] ERA, *Framework and approach for Western Power's fifth access arrangement review – Final decision*, 9 August 2021, p 20.

- the intent of the tariff structure is to signal the efficient utilisation of the network, with the demand charges only to apply during the on peak period after a baseline level of network utilisation has been achieved;
- our proposal strikes an appropriate balance that allows retailers the flexibility to manage their exposure to variations in end user consumption without an unnecessarily burdensome tariff structure; and
- the added complexity and cost required for both Western Power and retailers' billing systems to accommodate tariff structures with multiple charging parameters and prices would outweigh the benefits – particularly given the expected forecast demand for these services is expected to be low over the AA5 period.

Further, Western Power has designed the measure of network use to provide strong support to EV charging stations during this access period, ie, the calculation of network use by an EV charging site:

- excludes the twelve 30-minute intervals between 9am and 3pm (being the solar soak period in other tariffs); and
- excludes the first 10kW of demand in any 30-minute interval.

It follows that, for the purpose of selecting the applicable sliding demand charge, an EV charging station's draw on the network is measured as:

$$\frac{\text{30 minute intervals with demand above 10kW outside of 9am to 3pm}}{\text{total 30-minute intervals in a billing period}}$$

To further incentivise the deployment of EV charging infrastructure over AA5, Western Power proposes to exempt users from paying for capacity charges when their use of the network is low.

Capacity charges will only be incurred after a charging sites' use of the network exceeds 15% (with reference to the above calculation). For context, this would equate to exceeding 7.2 intervals (30-minute periods) of charging (equivalent to an average of 6 cars per day) outside the super off-peak charging window (9am to 3pm).

Western Power is forecasting a total of 50 dedicated EV charging stations over the AA5 period. In the context of publicly available EV charging, Western Power is also aware of announcements from traditional fuel distributors, such as Ampol and BP, on the co-location of EV charging infrastructure with their traditional petrol fuelling stations.[24]

Western Power considers the dedicated EV charging tariff developed and introduced in AA5 needs to be commensurate with the expected demand for this service, while remaining cognisant of the potential future network costs these facilities can impose with high coincident demand during the network peak period. Western Power will continue to monitor the uptake of EVs and the use the network by dedicated EV charging stations over AA5 and beyond and will revise the tariff structure appropriately when EV charging stations no longer require the same level of support, ie, because their utilisation is much higher.

Tariff structure

Both our dedicated EV charging station tariffs comprise:

- a fixed, daily charge for access to our network that reflects the costs of providing connection assets;

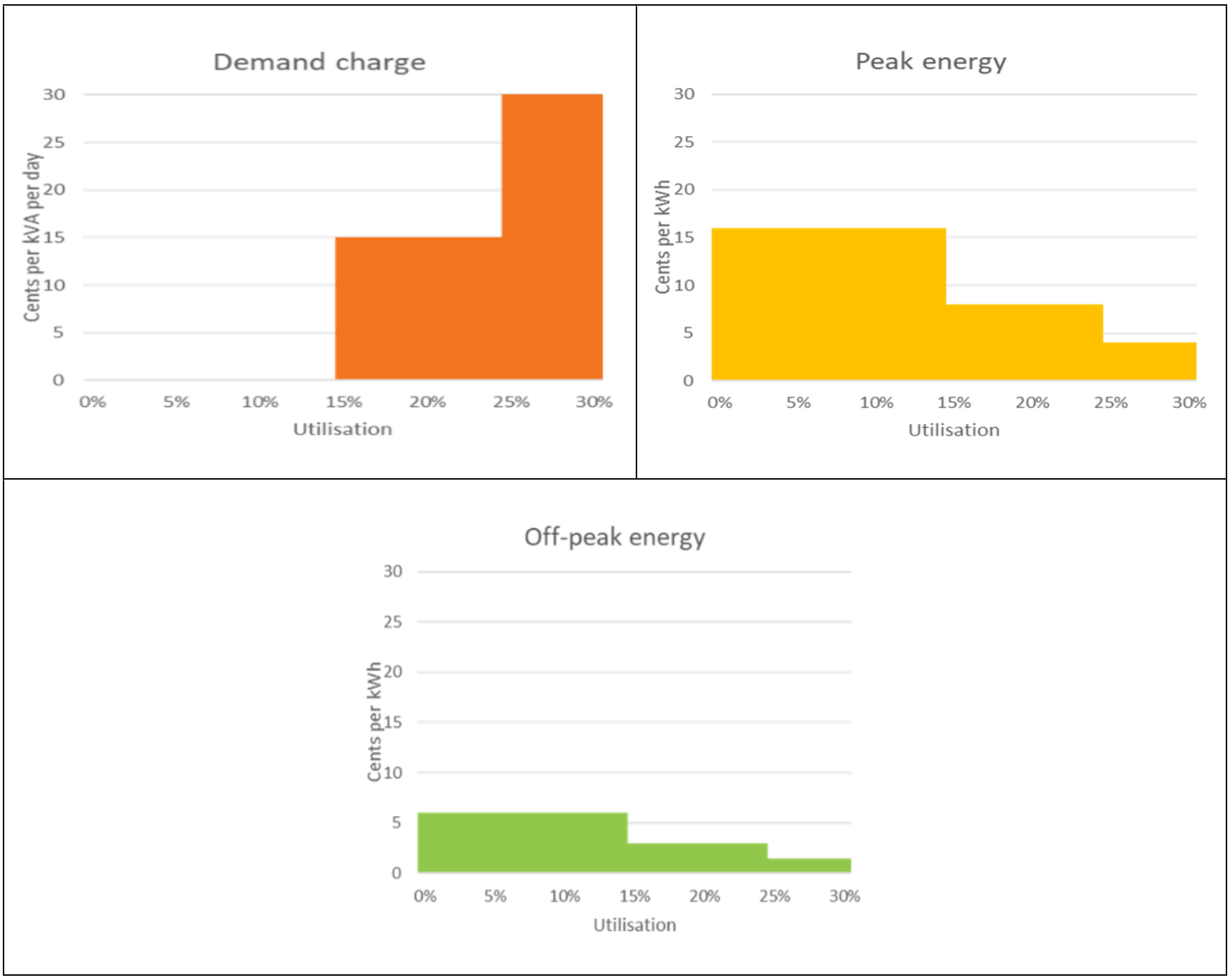
[24] Western Power expects these existing end-users are likely to accommodate any increased electricity consumption within the envelope of their existing tariffs, or to instead increase their existing maximum metered demand and/or contracted maximum demand – rather than using Western Power's dedicated EV tariff.

- a fixed, daily metering charge per meter;
- a sliding scale of demand charges that increase with utilisation, and remain at zero until 15 per cent utilisation[25] ;
- a sliding scale of off-peak and on-peak energy charges that decrease with utilisation.

By way of context to this sliding scale of charges, we illustrate indicative variable charges for our low voltage EV tariff in Figure 3.6 below. We note that the sliding scale of variable charges are constant from a utilisation measure above 30 per cent.

Western Power also proposes to introduce EV tariffs with a contract maximum demand reference tariff for those sites with high network use that require access to this type of tariff.

Figure 3.6: Indicative variable prices for low voltage EV tariff



We describe the structure of our tariffs for dedicated EV fast-charging stations in more detail in section 6 of the technical summary that accompanies this TSS overview.

[25] We will continually review and revise this utilisation threshold over time as dedicated EV charging stations start connecting to our network.

4. How do we set prices?

The amount of revenue we can recover from our end-users is capped by the ERA at the start of our AA5 period. The prices we set through our tariffs are designed to recover that amount of revenue and approved by the ERA annually.

Setting prices is important for our end-users because it is how we:

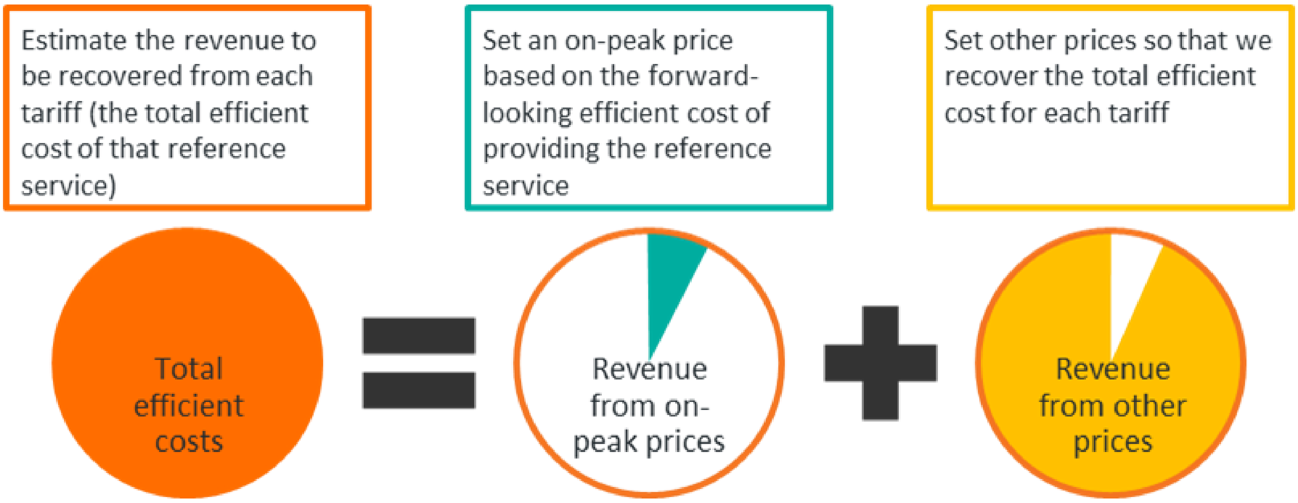
- promote the efficient use of our network and the transition to renewable sources of generation, which benefits all our end-users; and
- determine the share of our efficient costs to be recovered from different end-users.

At a very high level, our approach involves:

- setting a price for each reference tariff – typically the on-peak price[26] – based on the future network costs that can be avoided (or caused) by changing their use of our network during the on-peak period; and
- setting the remaining prices for a reference tariff – eg, fixed and other variable charges – so that we can recover the total efficient cost of providing the applicable reference service.

We illustrate this framework and the relationship between these steps, in Figure 4.1.

Figure 4.1: Illustration of new tariff framework



We describe our application of this framework below, ie:

- how we set prices based on forward looking efficient costs; and
- then set other prices so that, in aggregate, we recover the total efficient cost of providing each reference service.

[26] Outside of periods of very high demand, additional demand typically does not cause an increase in our future costs, because it can be served by existing, excess capacity.

4.1 Prices based on forward-looking efficient cost

It is well accepted that economic efficiency is promoted by prices based on the *future costs* that can be caused or avoided by an end-user decision. For instance, a key figure in the history of efficient pricing, Alfred E. Kahn, explained that efficiency:[27]

> *…looks to the future, not to the past: it is only future costs for which additional production can be causally responsible; it is only future costs that can be saved if that production is not undertaken.*

It is for this reason that the overwhelming focus of recent tariff reform in Australia has been on signalling to end-users the effect of their decisions on future network costs, rather than on the allocation of the historical, sunk cost of the existing network.

This inherent focus on future costs is reflected in the efficiency-based pricing objective in the Code and the more specific requirement that:[28]

> *Each reference tariff must be based on the forward-looking efficient costs of providing the reference service to which it relates to the customers [end-users] currently on that reference tariff.*

The Code also specifies that the calculation of these forward-looking efficient costs must have regard to the additional costs of meeting demand at times of greatest utilisation of the relevant part of our network, and how long run marginal costs (LRMC) may vary across our network.

Prices based on future costs promote economic efficiency because they:

- encourage end-users to use our network when it does not cause additional future costs;
- ensure that end-users that do use the network when it imposes future costs are willing to pay for those costs;
- enable end-users to decide whether an installation on their premises (eg, solar PV, storage or more efficient appliances) or a change in their behaviour can better meet their needs (or other end-users' needs) at a lower cost; and
- indicate to Western Power where end-users value investments in additional network capacity, ie, where there is not a lower cost non-network solution.

LRMC can vary according to:

- the time of day;
- the network levels used to provide services;
- whether network use increases or decreases; and
- the geographic area within the network.

We estimated the forward-looking efficient cost (or future cost) of providing each reference service by grouping together those reference services for which the future cost is likely to be very similar. We estimate that the forward-looking efficient cost during the on-peak period is:

- $22.70 per kW for residential customers connected to the low voltage network;
- $23.65 per kW for business customers connected to the low voltage network; and
- $24.70 per kW for all customers connected to the high voltage network.

We explain in detail how we derived these estimates and converted them into efficient price signals (typically on-peak prices) in section 2 of the technical summary that accompanies this TSS overview.

[27] Kahn, A, *The economics of regulation: Principles and institutions*, Massachusetts Institute of Technology, volume one, p 98.
[28] Electricity Networks Access Code , clause 7.3G.

Our relatively low estimates of forward-looking efficient cost reflect the availability of excess capacity on our network and, as a result, the limited future costs required to meet expected demand. There has also been a general decline in forward-looking efficient costs in the NEM in recent years, as end-users change the way they use the network and demand growth slows.

Further, our similar estimates of LRMC on the high and low voltage network reflect that the majority of growth-related expenditure relates to the high voltage network, with the consequence that an incremental unit of demand on either the high or low voltage network results in a similar level of future costs.

4.1.1 We can improve efficiency by reducing on-peak prices

The key insight from our estimates of future costs is that the efficient on-peak prices – which are derived from our estimates of future costs – are well below our existing on-peak prices.

We can therefore increase efficiency by reducing our on-peak prices.

This is because it is efficient for an end-user to use our network when the benefit they derive outweighs the additional costs that they cause.[29] If an end-user is willing to pay the efficient on-peak price, then the benefit they derive must be higher than the additional costs they cause.

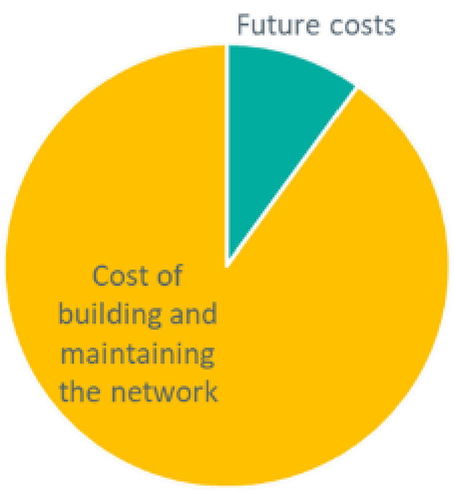
If peak prices are too high, then we are discouraging end-users from using the network even when the benefits outweigh the costs – which is not an efficient outcome.

However, to ensure that we still recover the total efficient cost of providing a reference service, a strong reduction in peak prices would require offsetting:

- increases in non-peak variable prices, which would:
  - reduce the differential between peak and non-peak prices and therefore weaken the incentive for end-users to shift load out of the peak period; and
  - shift non-peak prices further from their efficient level, which is at or very close to zero; and/or
- an increase in the fixed price, which can have adverse effects on certain end-users.

We are therefore transitioning our peak prices to the efficient level through time, which also assists in managing the potential effects on our end-users, consistent with the feedback we received from users and end-use customers.

Further, estimates of future costs vary considerably through time, depending on current expectations as to future demand and the future cost of meeting that demand. This means that the periodic resetting of prices at efficient levels, with no transition, can lead to price shocks for end-users. A transition to efficient on-peak prices is consistent with the approach that is generally applied in the NEM. This is particularly relevant in the current, dynamic state of the electricity market, and it also reflects our end-users' preferences for price stability.



4.2 How do we set other prices in a reference tariff?

Providing electricity network services requires a significant, upfront cost to build the network.

[29] Provided there is no cheaper alternative option that can better meet their needs.

The cost of building and maintaining our network, as it stands today, is much greater than the future cost required to provide new reference services, facilitate growth, and replace existing assets at the end of their economic life.

An important consequence is that prices based on future costs – which promote efficiency but therefore reflect only future costs – are not sufficient to recover the total efficient cost of providing reference services using our existing network.

We therefore need to include other prices (not based on future costs) in each tariff to recover in aggregate our total efficient costs, as approved by the ERA.

4.2.1 Our overarching framework

When combined with prices based on future costs (typically on-peak prices), these other prices should:

- recover the total efficient cost of providing the applicable reference service; and
- across all reference services, recover our revenue target approved by the ERA.

These outcomes are also a requirement of the Code.[30]

We achieve these outcomes by:

- allocating our efficient costs (target revenue approved by the ERA) across our reference services, while improving efficiency and managing bill impacts; and
- setting the price of fixed and other variable charges so that we expect to recover the total efficient cost of each reference service.

We explain our approach to addressing these two essential steps below.

4.2.2 How do we calculate the total efficient cost of providing each reference service?

We explain the methodology we apply to allocate target revenue to each distribution reference service in further detail in sections 3 and 4 of the technical summary that accompanies this TSS overview. We include below a high-level description of how we calculate the total efficient cost of providing each reference service and set prices, which involves:

1. Determining an upper and lower bound on the efficient cost of providing each reference service, ie, the stand alone and avoidable cost.
2. Applying our cost allocation methodology to allocate costs to each reference service, subject to those bounds.
3. Determining the price level for each charge in a reference tariff to promote the efficient use of our network and recover the costs allocated to that reference service.
4. Considering the need for transitional arrangements to manage the effects of improving the efficiency of our tariffs on our end users' network bills.

An upper and lower bound

Economic principles and the Code[31] require that the total efficient cost of providing each reference service – being the level of revenue recovered from each reference service – is:

[30] Electricity Networks Access Code, clause 7.3G and 7.3H.
[31] Electricity Networks Access Code, clause 7.3D.

- no more than the efficient cost of providing that service alone (the stand-alone cost) – if those end-users are charged more than the stand-alone cost, then it would be hypothetically possible for them to pay an alternative provider to provide the service at a lower cost; and
- no less than the additional costs directly incurred to provide the service (the avoidable cost) – if those end-users were charged less than the avoidable cost then the business would not be recovering the costs incurred to supply the end-users, and the shortfall in revenue would have to be recovered from other end-users .

For more detail, we explain how we estimate stand-alone and avoidable cost in section 5 of the technical summary that accompanies this TSS overview. Having established these bounds for each tariff, we determine the allocation between those bounds based on the methodology we describe below.

Our cost allocation methodology

Although economic principles establish this upper and lower bound on the level of revenue to be recovered from each reference tariff (the total efficient cost), they do not identify a unique, efficient allocation for each reference tariff.

This is reflected in the significantly different approaches adopted by networks in the NEM. For example, the approved approach of the electricity network provider in the Australian Capital Territory, Evoenergy, is based on the allocation of costs in the previous year,[32] whereas Ausgrid (a network service provider in New South Wales) approved approach is:[33]

> *…based on their relative contribution to maximum demand, a key driver of our efficient costs.*

These allocation methodologies have not been an area of focus for tariff reform in the NEM, reflecting that the promotion of economic efficiency relies on signalling future costs to end-users.

Our overarching approach to allocating costs is:

- to calculate the strictly efficient cost of providing each reference service to end-users based on the value of the assets they use and the extent to which they use those assets, relative to customers using other reference services; and
- to then transition the revenue recovered from each reference tariff towards that efficient reference point (or target) over time, while managing end-user bill impacts.

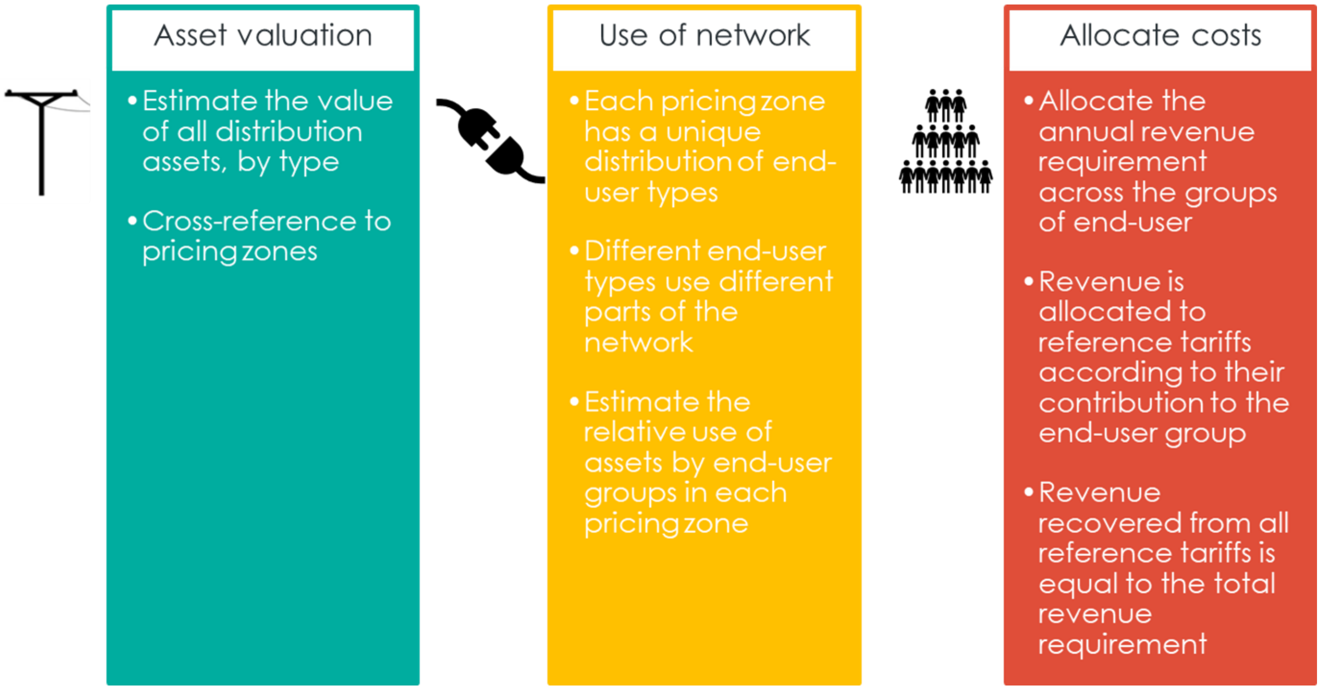
We consider these foundational principles to be a fair and reasonable basis for the allocation of our efficient costs.

Efficient reference point

We describe in detail the calculation of the efficient reference point, or target, for each reference tariff in section 3 of the technical summary that accompanies this TSS overview and summarise its key elements in Figure 4.2 below.

[32] Evoenergy, *Attachment 1: Revised Proposed Tariff Structure Statement*, November 2018, p 35.
[33] Ausgrid, *Revised Proposal Attachment 10.01 Tariff Structure Statement*, January 2019, p 69.

Figure 4.2: Overview of calculation of efficient cost target

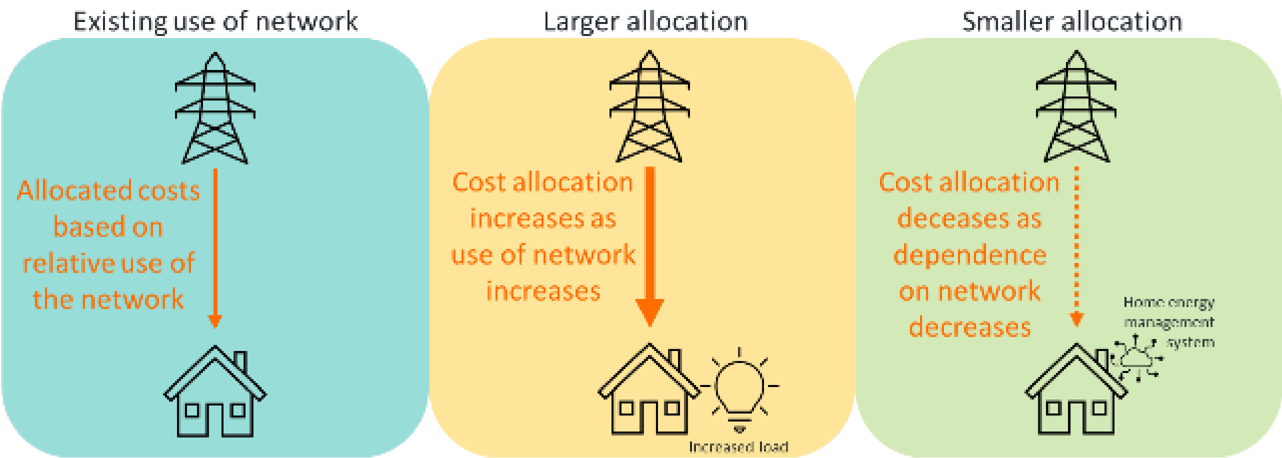


Importantly, our methodology ensures that our efficient reference point, or target, reflects the changing way that end-users use our network. For example, if end-users using a particular reference service change their behaviour to reduce their maximum demand (eg, by shifting their load or investing in energy efficient appliances and DER), this will in turn be reflected in a lower efficient cost target.

Similarly, if in the future managing residential exports leads to investments in new assets, then there will be a commensurate increase in the share of our costs allocated to residential end-users.

Indicative examples of how the calculation of the efficient reference point for each reference tariff may change in respond to shifts in end-user behaviour are presented in Figure 4.3.

Figure 4.3: Network use is a key driver of our cost allocation methodology



A transition to manage bill impacts and data improvements

The allocation of our revenue target to each reference tariff is a key driver of end-users' network bills. For this reason, we carefully consider the extent to which there is any difference between the level of revenue we currently recover from each reference tariff and the efficient target for that reference tariff.

Such differences may arise from:

- the more prescriptive application of a cost allocation methodology required by the new pricing framework in the Code;
- using updated asset valuation data in the calculation of the efficient cost target; and/or
- historical differences between the current allocation of costs and the efficient cost target.

Feedback from stakeholders emphasised the need to manage the effects of tariff changes on our end-users.

In our view, end-users' preferences would best be met by transitioning to the efficient allocation of costs through time. This will avoid price shocks and provide end-users and stakeholders an opportunity to prepare for arriving at the efficient cost allocation in the future.

A transition is particularly appropriate in the context where these changes have no incremental effect on efficiency. It follows that there are limited benefits to weigh against the potential effects on our end-users.

Continual improvements in the quality of our asset data are key to this transition, since updated estimates of the efficient allocation in the future may well lead to a different allocation.

In light of these considerations, we will gradually transition the level of revenue recovered from each reference tariff to the total efficient cost of providing the applicable reference tariff, while managing end-user bill impacts.

The forecast weighted average price change in section 5.4 reflects the result of our allocation of target revenue to each reference tariff.

4.2.3 How do we set the remaining prices?

Having determined the total level of revenue to be recovered from each reference tariff, the last step in the price-setting process is to set other prices to recover the difference between:

- the revenue that we expect to recover from prices based on future costs (typically on-peak prices);[34] and
- the total efficient cost of providing that reference service (the total revenue to be recovered from that tariff).

The result of this process is that the combination of these other prices and our prices based on future costs enable us to recover the total efficient cost of providing the relevant reference service.

[34] By way of reference only, we note that the difference between the total level of revenue to be recovered from a reference tariff and the level of revenue from the LRMC-based prices is typically referred to as the 'residual cost' in the NEM.

Rebalancing away from non-LRMC variable charges

The Code requires us to achieve this outcome in a way that minimises distortions to the price signals for efficient use that arise from our LRMC-based prices.[35]

We are reducing variable charges to improve utilisation when there is excess capacity and to reduce distortions to our efficient price signals.

It is well accepted in economics that distortions to efficient prices signals are minimised by prices that are independent from use of the network, ie, fixed charges.[36]

Upon the introduction of an equivalent requirement to minimise distortions in the NER, the AEMC observed that:[37]

> *The AER considered that mark-ups above marginal cost should be assigned to fixed charges as this would result in the least distortion to efficient patterns of consumption as consumers are least responsive to changes in fixed charges.*
>
> *…The AER noted that the firm requirement of the underlying principle of minimising distortions combined with discretion for DNSPs to apply it in the way that best suits their network and consumer characteristics, achieves the appropriate balance of flexibility and prescription*

There is also a further, related requirement in the Code that, unless another approach better meets the Code objective:[38]

> *…any amount in excess of the incremental cost of service provision should be recovered by tariff components that do not vary with usage or demand.*

Under the pricing framework in the Code,[39] any increase in fixed charges would be offset by a commensurate reduction in variable charges, such that the total level of revenue we expect to recover from each reference tariff remains unchanged.

The principal benefit of a rebalancing away from non-LRMC based variable charges is that it:

- encourages end-users to shift their load outside of the on-peak period, when there is excess capacity available and additional demand causes no future costs; and
- encourages end-users to make efficient investments that reduce their demand during the on-peak period, rather than at other times when no network costs are avoided, eg, to couple solar PV with storage or participate in community battery initiatives.

On the other hand, rebalancing away from variable charges generally:

- has disproportionate, adverse effects on low energy users, since they benefit relatively less from the reduction in variable charges;
- inhibits the ability of end-users to control the network component of their bills; and
- alters the economics of past investments in solar PV installations, although this is already the case with the super off-peak period.

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[35] Electricity Networks Access Code, clause 7.3H(c).

[36] Ramsey (1927) first solved the problem of maximising welfare subject to a profitability constraint in the context of optimal taxation, and the result was later applied to natural monopolies by Baumol and Bradford (1970), as well as in an earlier paper (in French) by Boiteux (1956). See: Ramsey, F., 1927, *A Contribution to the Theory of Taxation*, Economic Journal, Vol 37 No. 145, page 47 to 61; Baumol, W. and D. Bradford. 1970, *Optimal departures from marginal cost pricing*, American Economic Review, 60, 265-283.

[37] AEMC, *Rule Determination | National Electricity Amendment (Distribution Network Pricing Arrangements) Rule 2014, 27 November 2014*, p 154.

[38] Electricity Networks Access Code, clause 7.6(b).

[39] Electricity Networks Access Code, clause 7.6.

Since we are also required to accommodate the reasonable requirements, or preferences, of users and end-use customers,[40] we propose to apply a gradual transition away from variable charges. We provide further information on this transition in section 5.3.

We consider this approach strikes the best balance between the efficiency-based requirements of the Code and our end-users' preferences.

[40] Electricity Networks Access Code, clause 7.3F.

5. Price forecast and bill impacts over AA5

In this section we provide information on the effects of our tariffs over AA5, including:

- an explanation of how holding prices constant in the first year of AA5 (FY23) contributes to a price change in year two;
- a forecast of the weighted average annual price change for each tariff over AA5, consistent with clause 7.1D of the Code; and
- additional information as to how the split between fixed and variable charges is likely to change over AA5 for each reference tariff.

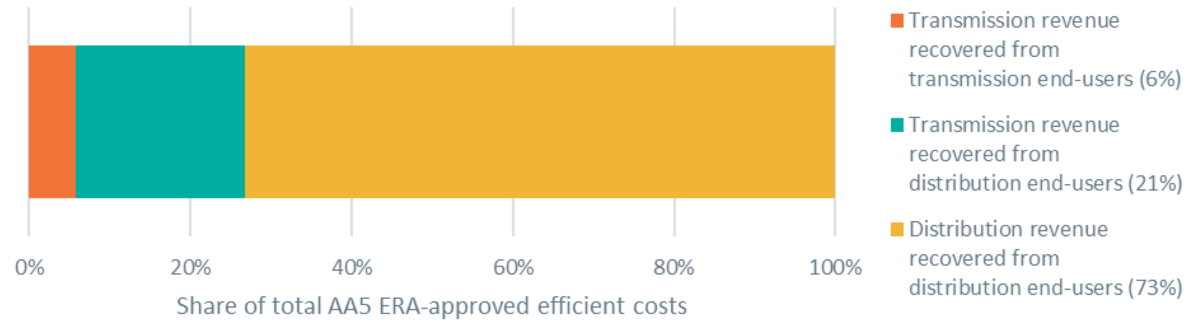
5.1 Combined distribution and transmission prices in AA5

Although our network comprises an electricity transmission and distribution network, we publish bundled (combined transmission and distribution) prices for our distribution connected end-users in AA5.[41]

Since the vast majority of our customers are connected to our distribution network, we recover approximately 94 per cent of our efficient cost (or revenue), as approved by the ERA, from distribution customers.

The cost recovered from distribution end-users comprises the cost of our distribution network and a share of the cost of our transmission network, which is also required to serve distribution connected end-users. The remaining cost of our transmission network is recovered from end-users that use our transmission network only. Figure 5.1 presents a break-down of the share of distribution and transmission revenue recovered from different end-users over AA5.

Figure 5.1: Share of total revenue recovered over AA5 by reference service



5.2 Our transition path for prices in AA5

Changes in the prices that comprise each tariff are generally driven by:

- the total efficient cost of operating our network (our target revenue), as approved by the ERA;
- our forecast of connection numbers, energy and demand; and
- improving the efficiency of our tariffs, which we propose to implement gradually to manage the effects on end-users.

[41] ERA, *Framework and approach for Western Power's fifth access arrangement review – Final decision*, 9 August 2021, p 38.

To manage the potential effects on end-users of moving to more efficient tariffs, we endeavour to limit the increase in the average price of a tariff to no more than two per cent above the change that is required to recover our ERA-approved efficient costs (or revenue target).

This target cap on the increase to the average price of tariffs will limit the extent to which we can reduce the average price of tariffs that need to reduce in price. It is important to highlight that the target maximum caps above would apply only to tariffs that need to increase in price relative to other tariffs, and that not all tariffs that need to increase in price will increase up to the cap.

As published in the ERA's final decision on the framework and approach,[42] Western Power's current price list will apply until the revised access arrangement comes into effect, hence the methodology in our TSS will only be applied in the second year of AA5 (FY24).

Due to holding prices constant in year one of AA5 is that we are less likely to recover our revenue target in that year. The price control formula under our access arrangement allows us to recover a revenue adjustment (being the difference between our target revenue and the actual revenue recovered in the first year of AA5 (FY23)) in the third pricing year of AA5 (FY25).

Since our ERA-approved efficient costs in AA5 have increased in comparison to AA4[43] and we cannot adjust prices in year one of AA5 there is more upwards pressure on prices in years two to five of AA5 to recover these increased ERA-approved efficient costs. In other words, the absence of any price change in year one necessitates a relatively bigger price change than would otherwise have been the case in subsequent years.

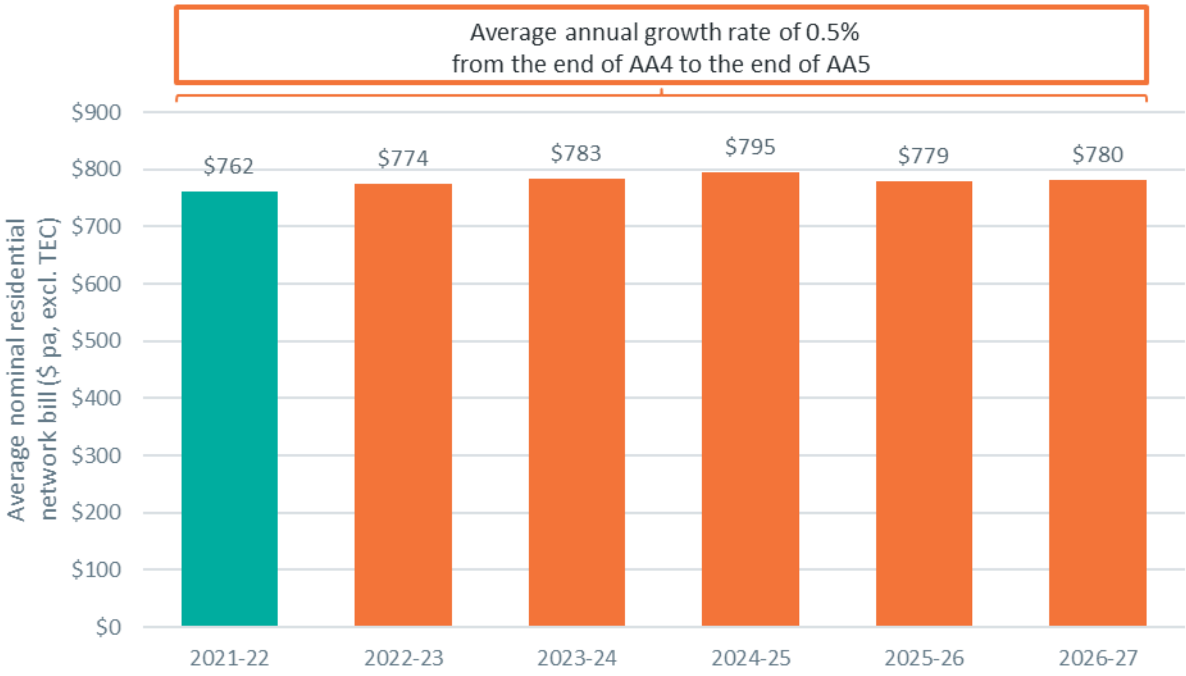
We have dedicated significant effort to smoothing the resulting effects on our customers by spreading price changes over multiple years.

In Figure 5.2 we illustrate that over AA5 the average annual change in revenue per residential end-user is equal to only 0.5 per cent per annum in nominal terms, which represents a material expected decrease in real terms.

[42] ERA, *Framework and approach for Western Power's fifth access arrangement review – Final decision*, 9 August 2021, p 38.

[43] This is due to a range of factors, including (but not limited to) an increased cost of capital and inflation expectation.

Figure 5.2: Average price outcomes for residential end-users over AA5



5.3 Allocation of revenue recovered from fixed charges and variable charges

Our price setting process consists of two simple, distinct stages, ie:

- allocate our ERA-approved efficient costs (or revenue target) into an amount to be recovered from each reference tariff that:
  - recovers our aggregate revenue target each year;
  - follows our proposed price path, as described in section 5.2; and
  - improves the efficiency of our cost allocation between reference tariffs, where possible; and
- set individual charging components of each reference tariff to recover this allocated revenue, based on our expected connection numbers, energy and demand forecasts.

Under this approach, the total revenue we intend to recover from each reference tariff is independent from the structure of the tariff itself.

The allocation of our ERA-approved revenue target to individual reference tariffs has been undertaken with end-user equity front of mind in order to minimise potential customer impacts.

In response to the ERA's Draft Decision and stakeholder feedback we have moderated the extent of rebalancing towards fixed charges that we will implement in AA5. This assists in managing bill impacts for relatively smaller energy consumers. More detailed consideration of the bill impacts for smaller energy consumers from our proposed tariff structures is presented in section 5.5.

In Table 5.1 we present the annual change in fixed charges for residential end-users over AA5. We propose to improve equity between our residential end-users by applying the same fixed charge to all our residential end-users. Fixed charges for residential end-users increase in FY24 and FY25 – broadly in line with the increase in our revenue target in those years – and then remain relatively flat in nominal terms for the remainder of AA5, which represents an expected decrease in fixed charges in real terms.

Table 5.1: Indicative annual change in fixed charges for residential end-users

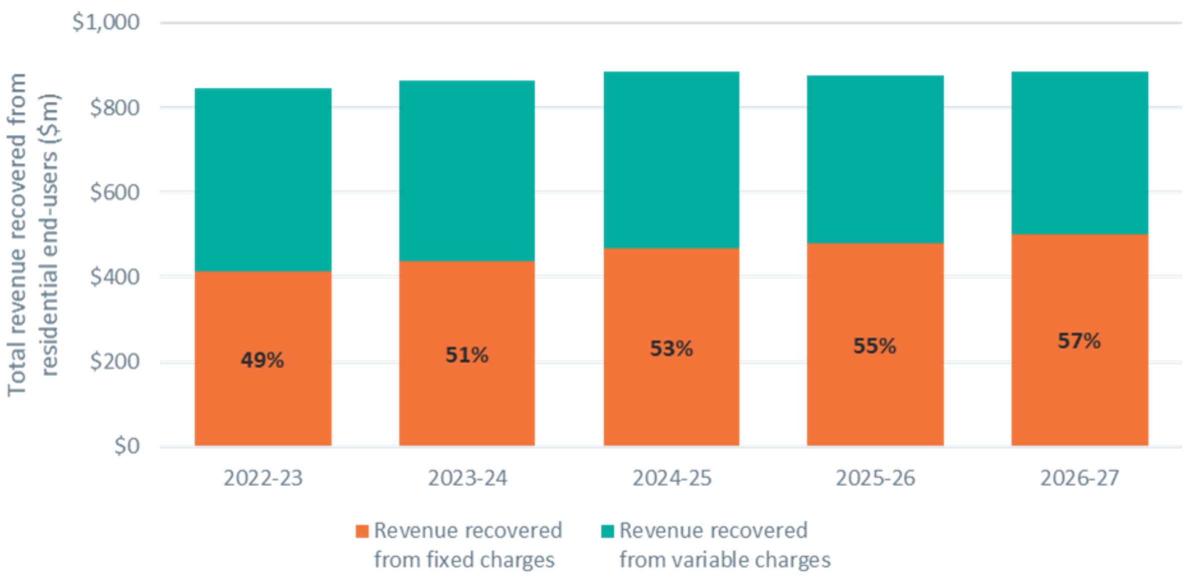
	FY23	FY24	FY25	FY26	FY27
Change in fixed charge	0 per cent	3.2 per cent*	5.2 per cent	3.0 per cent	3.9 per cent

** RT17 has a lower increase in fixed charge*

In Figure 5.3 we present the indicative share of revenue that we expect to recover from fixed and variable charges over AA5 from residential customers. In line with the 2022 demand forecasts, the proportion of the fixed component is increasing because of forecast customer demand falling over the AA5 period. As noted in section 5.1.2 of the Revised Proposal, this trend could be offset by changes in customer behaviour or technological change. For example, prospects for EV adoption have been considered; however, they have been excluded as a specific driver for the 2022 demand forecasts as adoption rates are expected to remain relatively low until 2027. Future adoption of EVs in Western Australia has the potential to put upward pressure on customer demand over AA5 and beyond.

We present detailed assessments of end-user bill impacts in section 5.5, including for smaller energy consumers.

Figure 5.3: Indicative share of revenue target recovered from fixed and variable charges



In Figure 5.2 we present the annual change in fixed charges for small business end-users over AA5. Our small business reference tariffs are designed for different connection sizes, which is reflected in the magnitude of the fixed charge for each small business reference tariff. Western Power has applied a consistent common annual increase in the fixed charge for each of our small business reference tariffs over AA5.

Table 5.2: Indicative annual change in fixed charges for small business end-users

	FY23	FY24	FY25	FY26	FY27
Change in fixed charge	0 per cent	5.75 per cent	5.24 per cent	3.0 per cent	3.9 per cent

5.4 Forecast weighted average price change for each reference tariff

We summarise in Table 5.3 our forecast weighted average price change for each reference tariff in the AA5 period. We explain the methodology that we apply to derive this forecast in section 8 of the technical summary that accompanies this TSS overview.

The weighted average price change for a reference tariff is calculated using the indicative prices for each year of the AA5 period and a volume estimate for the first pricing year of AA5 (FY23). The reason for using a common set of volume inputs is to ensure the calculated change in revenue between years is attributed solely to the change in the price of individual tariff components between years. As a result, the weighted average price change below is likely to overestimate the average bill impacts for residential end-users. This is because, we expect residential energy use per end-user to decrease over AA5, which requires higher unit rates to recover a similar level of revenue from each residential end-user year-to-year.

While the analysis below holds end-users' energy use constant over AA5, and so is likely to overestimate the effect of higher variable prices, Western Power considers the effect of those higher variable prices will be partially offset by decreases in energy consumption.

We will be able to further refine our forecast of weighted average annual price changes over the course of the 2022-23 financial year, as we gain access to a larger sample of interval data for residential end-users. This forecast is based on a limited sample comprising the 2.5 per cent of residential end-users with advanced metering infrastructure, whereas this sample will increase to represent approximately 20 per cent of residential customers by July 2023.

The weighted average price change for the new storage and EV tariffs being introduced in the AA5 period will be developed as customer data is collected over AA5 and included in the weighted average price change forecasts published as part of our annual pricing proposals.

Table 5.3: Forecast weighted average price change for each year of AA5

Tariff	Service	Average price change 22/23 %	Average price change 23/24 %	Average price change 24/25 %	Average price change 25/26 %	Average price change 26/27 %
RT1	**A1 – Anytime Energy (Residential) Exit Service**	*0%*	*-0.1%*	*2.5%*	*1.5%*	*1.7%*
RT2	**A2 – Anytime Energy (Business) Exit Service**	*0%*	*-0.2%*	*3.8%*	*5.3%*	*4.8%*
RT3	**A3 – Time of Use Energy (Residential) Exit Service**	*0%*	*2.9%*	*5.2%*	*5.3%*	*1.5%*
RT4	**A4 – Time of Use Energy (Business) Exit Service**	*0%*	*5.3%*	*5.2%*	*5.3%*	*5.5%*

RT5	**A5 – High Voltage Metered Demand Exit Service or C5 Bi-directional Service**	*0%*	*-1.9%*	*3.7%*	*2.1%*	*1.7%*
RT6	**A6 – Low Voltage Metered Demand Exit Service or Bi-directional Service**	*0%*	*-0.4%*	*4.0%*	*4.1%*	*3.1%*
RT7	**A7 – High Voltage Contract Maximum Demand Exit Service or C7 Bi-directional Service**	*0%*	*-1.8%*	*3.3%*	*2.1%*	*2.5%*
RT8	**A8 – Low Voltage Contract Maximum Demand Exit Service or Bi-directional Service**	*0%*	*-1.6%*	*4.2%*	*3.1%*	*1.4%*
RT9	**A9 – Streetlighting Exit Service**	*0%*	*0.0%*	*0.6%*	*2.1%*	*0.0%*
RT10	**A10 – Unmetered Supplies Exit Service**	*0%*	*4.0%*	*2.0%*	*1.0%*	*1.8%*
RT11	**B1 – Distribution Entry Service**	*0%*	*5.4%*	*1.3%*	*3.3%*	*1.6%*
RT13	**C1 – Anytime Energy (Residential) Bi-directional Service**	*0%*	*-0.3%*	*2.4%*	*1.2%*	*1.5%*
RT14	**C2 – Anytime Energy (Business) Bi-directional Service**	*0%*	*-2.2%*	*3.1%*	*3.2%*	*4.9%*
RT15	**C3 – Time of Use (Residential) Bi-directional Service**	*0%*	*3.7%*	*5.2%*	*5.3%*	*2.1%*
RT16	**C4 – Time of Use (Business) Bi-directional Service RT16**	*0%*	*5.3%*	*5.2%*	*5.3%*	*5.5%*
RT17	**A12 – 3 Part Time of Use Energy (Residential) Exit Service or C9 Bi-directional Service**	*0%*	*4.0%*	*5.2%*	*5.3%*	*2.7%*
RT18	**A13 – 3 Part Time of Use Energy (Business) Exit Service or C10 Bi-directional Service**	*0%*	*4.1%*	*5.2%*	*5.3%*	*5.4%*
RT19	**A14 – 3 Part Time of Use Demand (Residential) Exit Service or C11 Bi-directional Service**	*0%*	*1.0%*	*5.2%*	*5.3%*	*0.4%*
RT20	**A15 – 3 Part Time of Use Demand (Business) Exit Service or C12 Bi-directional Service**	*0%*	*1.6%*	*5.2%*	*5.3%*	*5.5%*

RT21	**A16 – Multi Part Time of Use Energy (Residential) Exit Service or C13 Bi-directional Service**	*0%*	*5.4%*	*5.2%*	*5.3%*	*2.7%*
RT22	**A17 – Multi Part Time of Use Energy (Business) Exit Service C14 or Bi-directional Service**	*0%*	*5.4%*	*5.2%*	*5.3%*	*5.5%*
RT34	**A19 – Super Off-peak Energy (Business) Exit Service or – C17 Bidirectional service**	*0%*	*0%*	*4.0%*	*5.3%*	*5.5%*
RT35	**A18 – Super Off-peak Energy (Residential) Exit Service or C16 – Bidirectional Service**	*0%*	*0%*	*4.4%*	*2.1%*	*2.0%*
RT36	**A21 – Super Off-peak Demand (Business) Exit Service or C19 – Bidirectional Service**	*0%*	*0%*	*3.1%*	*4.6%*	*2.5%*
RT37	**A20 – Super Off-peak Demand (Residential) Exit Service or C18 – Bidirectional Service**	*0%*	*0%*	*3.4%*	*1.7%*	*2.0%*
RT38	**C23 – LV Distribution Storage Bidirectional Service**	*0%*	*0%*	*5.2%*	*5.3%*	*5.4%*
RT39	**C24 – LV Distribution Storage Bidirectional Service**	*0%*	*0%*	*5.2%*	*5.3%*	*5.4%*
RT40	**A22 – LV EV Charging Exit Service**	*0%*	*0%*	*5.2%*	*5.3%*	*5.4%*
RT41	**A23 – HV EV Charging Exit Service**	*0%*	*0%*	*5.2%*	*5.3%*	*5.4%*
TRT1	**A11 - Transmission Exit Service**	*0%*	*5.4%*	*5.2%*	*5.3%*	*5.4%*
TRT2	**B2 - Transmission Entry Service**	*0%*	*5.4%*	*5.2%*	*5.3%*	*5.4%*
TRT3	**C22 - Transmission Storage Service**	*0%*	*0%*	*5.2%*	*5.3%*	*5.4%*

5.5 Customer bill impacts (network component of reference tariffs only)

Our desired price path for AA5, as explained in section 5.2, applies to the average network revenue recovered from our customers. While this approach ensures that, on average, end-users network bill impacts are limited, some end-users may experience different outcomes due to the particular characteristics of their energy use.

In this section, we provide context to the potential network bill impacts on different types of end-users on each reference tariff. We present our network bill impacts as the rate of bill change, as a percentage, in nominal terms and have worked to remain within the constraints of our pricing strategy.

5.5.1 Residential end-users

Since we have no control over the assignment of end-users from one tariff to another, our network bill impact analysis focuses on the price impact between years for end-users on a particular reference tariff.

Our bill impact analysis is performed on five distinct, representative residential end-users, including:

- a low consumption residential end-user – the 25th percentile of total annual energy consumption from our residential end-user sample;
- a medium consumption residential end-user – the median of total annual energy consumption from our residential end-user sample;
- a high consumption residential end-user – the 75th percentile of total annual energy consumption from our residential end-user sample;
- a typical residential end-user with solar – the median of total annual energy consumption from our residential end-user sample for end-users with solar installations only; and
- a typical residential end-user without solar – the median of total annual energy consumption from our residential end-user sample for end-users without solar installations.

RT1/RT13 – Anytime energy residential tariffs

The customer network bill impacts for RT1 and RT13 over AA5 is shown in Table 5.4.

Table 5.4: Annual network bill impacts over AA5 for RT1/RT13

Representative end-user	Annual change FY22 to FY23	Annual change FY23 to FY24	Baseline $/year FY24	Annual change FY24 to FY25	Annual change FY25 to FY26	Annual change FY23 to FY27	Annualised change over AA5
Low consumption end-user	*0%*	*3%*	*541*	*4%*	*2%*	*3%*	***3%***
Medium consumption end-user	*0%*	*1%*	*665*	*3%*	*2%*	*2%*	***2%***
High consumption end-user	*0%*	*0%*	*806*	*3%*	*1%*	*2%*	***2%***
Typical solar end-user	*0%*	*1%*	*724*	*3%*	*1%*	*2%*	***2%***
Typical non-solar end-user	*0%*	*1%*	*656*	*4%*	*2%*	*2%*	***2%***

RT3/RT15 – Time of use residential tariffs

The customer network bill impacts for RT3 and RT15 over AA5 is shown in Table 5.5.

Table 5.5: Annual network bill impacts over AA5 for RT3/RT15

Representative end-user	Annual change FY22 to FY23	Annual change FY23 to FY24	Baseline $/year FY24	Annual change FY24 to FY25	Annual change FY25 to FY26	Annual change FY23 to FY27	Annualised change over AA5
Low consumption end-user	*0%*	*4%*	*558*	*6%*	*1%*	*3%*	***3%***
Medium consumption end-user	*0%*	*4%*	*695*	*5%*	*0%*	*2%*	***3%***
High consumption end-user	*0%*	*3%*	*847*	*5%*	*-1%*	*2%*	***2%***
Typical solar end-user	*0%*	*3%*	*741*	*5%*	*-1%*	*2%*	***3%***
Typical non-solar end-user	*0%*	*4%*	*684*	*5%*	*0%*	*2%*	***3%***

RT17 – 3 part time of use energy residential tariff

The customer network bill impacts for RT17 over AA5 is shown in Table 5.6.

Table 5.6: Annual network bill impacts over AA5 for RT17

Representative end-user	Annual change FY22 to FY23	Annual change FY23 to FY24	Baseline $/year FY24	Annual change FY24 to FY25	Annual change FY25 to FY26	Annual change FY23 to FY27	Annualised change over AA5
Low consumption end-user	*0%*	*3%*	*530*	*6%*	*1%*	*3%*	***3%***
Medium consumption end-user	*0%*	*4%*	*630*	*5%*	*-1%*	*3%*	***3%***
High consumption end-user	*0%*	*4%*	*742*	*5%*	*-2%*	*2%*	***2%***
Typical solar end-user	*0%*	*4%*	*678*	*5%*	*-1%*	*3%*	***3%***
Typical non-solar end-user	*0%*	*4%*	*623*	*5%*	*0%*	*3%*	***3%***

RT19 – 3 part time of use demand tariff (residential)

The customer network bill impacts for RT19 over AA5 is shown in Table 5.7.

Table 5.7: Annual network bill impacts over AA5 for RT19

Representative end-user	Annual change FY22 to FY23	Annual change FY23 to FY24	Baseline $/year FY24	Annual change FY24 to FY25	Annual change FY25 to FY26	Annual change FY23 to FY27	Annualised change over AA5
Low consumption end-user	*0%*	*6%*	*537*	*6%*	*2%*	*3%*	***4%***
Medium consumption end-user	*0%*	*6%*	*632*	*6%*	*2%*	*3%*	***4%***
High consumption end-user	*0%*	*6%*	*736*	*6%*	*1%*	*2%*	***4%***
Typical solar end-user	*0%*	*6%*	*675*	*6%*	*2%*	*3%*	***4%***
Typical non-solar end-user	*0%*	*6%*	*624*	*6%*	*2%*	*3%*	***4%***

RT21 – Multi part time of use energy residential

The customer network bill impacts for RT21 over AA5 is shown in Table 5.8.

Table 5.8: Annual network bill impacts over AA5 for RT21

Representative end-user	Annual change FY22 to FY23	Annual change FY23 to FY24	Baseline $/year FY24	Annual change FY24 to FY25	Annual change FY25 to FY26	Annual change FY23 to FY27	Annualised change over AA5
Low consumption end-user	*0%*	*5%*	*545*	*6%*	*0%*	*3%*	***3%***
Medium consumption end-user	*0%*	*5%*	*656*	*5%*	*-2%*	*3%*	***3%***
High consumption end-user	*0%*	*5%*	*781*	*5%*	*-3%*	*2%*	***2%***
Typical solar end-user	*0%*	*5%*	*707*	*5%*	*-2%*	*3%*	***3%***
Typical non-solar end-user	*0%*	*5%*	*647*	*5%*	*-2%*	*3%*	***3%***

RT35 – Super off-peak energy residential

The customer network bill impacts for RT35 over AA5 is shown in Table 5.9.

Table 5.9: Annual network bill impacts over AA5 for RT35

Representative end-user	Annual change FY22 to FY23	Annual change FY23 to FY24	Baseline $/year FY24	Annual change FY24 to FY25	Annual change FY25 to FY26	Annual change FY23 to FY27	Annualised change over AA5
Low consumption end-user	*0%*	*-2%*	*519*	*5%*	*2%*	*3%*	***2%***
Medium consumption end-user	*0%*	*-2%*	*626*	*5%*	*2%*	*2%*	***2%***
High consumption end-user	*0%*	*-1%*	*747*	*4%*	*1%*	*2%*	***2%***
Typical solar end-user	*0%*	*-1%*	*703*	*4%*	*1%*	*2%*	***2%***
Typical non-solar end-user	*0%*	*-2%*	*618*	*5%*	*2%*	*2%*	***2%***

RT37 – Super off-peak demand residential

The customer network bill impacts for RT37 over AA5 is shown in Table 5.10.

Table 5.10: Annual network bill impacts over AA5 for RT37

Representative end-user	Annual change FY22 to FY23	Annual change FY23 to FY24	Baseline $/year FY24	Annual change FY24 to FY25	Annual change FY25 to FY26	Annual change FY23 to FY27	Annualised change over AA5
Low consumption end-user	*0%*	*-2%*	*509*	*5%*	*2%*	*3%*	***2%***
Medium consumption end-user	*0%*	*-2%*	*600*	*5%*	*2%*	*2%*	***2%***
High consumption end-user	*0%*	*-1%*	*698*	*4%*	*1%*	*2%*	***2%***
Typical solar end-user	*0%*	*-1%*	*658*	*4%*	*2%*	*2%*	***2%***
Typical non-solar end-user	*0%*	*-2%*	*592*	*5%*	*2%*	*2%*	***2%***

5.5.2 Small business end-user

As with our residential end-users, our network bill impact analysis is performed on five distinct, representative small business end-users, including:

- a low consumption small business end-user – the 25th percentile of total annual energy consumption from our small business end-user customer sample;
- a medium consumption small business end-user – the median of total annual energy consumption from our small business end-user customer sample;
- a high consumption small business end-user – the 75th percentile of total annual energy consumption from our small business end-user customer sample;
- a typical small business end-user with solar – the median of total annual energy consumption from our small business end-user sample for end-users with solar installations only; and
- a typical small business end-user without solar – the median of total annual energy consumption from our small business end-user sample for end-users without solar installations.

RT2/RT14 – Anytime energy business tariffs

The customer network bill impacts for RT2 and RT14 over AA5 is shown in Table 5.11.

Table 5.11: Annual network bill impacts over AA5 for RT2/RT14

Representative end-user	Annual change FY22 to FY23	Annual change FY23 to FY24	Baseline $/year FY24	Annual change FY24 to FY25	Annual change FY25 to FY26	Annual change FY23 to FY27	Annualised change over AA5
Low consumption end-user	*0%*	*8%*	*891*	*5%*	*1%*	*5%*	***5%***
Medium consumption end-user	*0%*	*4%*	*1,276*	*4%*	*2%*	*5%*	***4%***
High consumption end-user	*0%*	*1%*	*1,937*	*4%*	*2%*	*5%*	***3%***
Typical solar end-user	*0%*	*2%*	*1,872*	*4%*	*2%*	*5%*	***3%***
Typical non-solar end-user	*0%*	*1%*	*2,214*	*3%*	*2%*	*5%*	***3%***

RT4/RT16 – Time of use business tariffs

The customer network bill impacts for RT4 and RT16 over AA5 is shown in Table 5.12.

Table 5.12: Annual network bill impacts over AA5 for RT4/RT16

Representative end-user	Annual change FY22 to FY23	Annual change FY23 to FY24	Baseline $/year FY24	Annual change FY24 to FY25	Annual change FY25 to FY26	Annual change FY23 to FY27	Annualised change over AA5
Low consumption end-user	*0%*	*10%*	*1,453*	*6%*	*0%*	*5%*	***5%***
Medium consumption end-user	*0%*	*9%*	*1,862*	*5%*	*-2%*	*5%*	***4%***
High consumption end-user	*0%*	*8%*	*2,614*	*5%*	*-3%*	*5%*	***4%***
Typical solar end-user	*0%*	*8%*	*2,263*	*5%*	*-3%*	*5%*	***4%***
Typical non-solar end-user	*0%*	*8%*	*2,825*	*5%*	*-3%*	*5%*	***4%***

RT18 – 3 part time of use energy business tariff

The customer network bill impacts for RT18 over AA5 is shown in Table 5.13.

Table 5.13: Annual network bill impacts over AA5 for RT18

Representative end-user	Annual change FY22 to FY23	Annual change FY23 to FY24	Baseline $/year FY24	Annual change FY24 to FY25	Annual change FY25 to FY26	Annual change FY23 to FY27	Annualised change over AA5
Low consumption end-user	*0%*	*12%*	*899*	*6%*	*0%*	*5%*	***6%***
Medium consumption end-user	*0%*	*10%*	*1,265*	*6%*	*-1%*	*5%*	***5%***
High consumption end-user	*0%*	*8%*	*1,910*	*5%*	*-2%*	*5%*	***4%***
Typical solar end-user	*0%*	*8%*	*1,827*	*5%*	*-2%*	*5%*	***4%***

Typical non-solar end-user	*0%*	*7%*	*2,148*	*5%*	*-3%*	*5%*	***4%***

RT20 – 3 part time of use demand tariff (business)

The customer network bill impacts for RT20 over AA5 is shown in Table 5.14.

Table 5.14: Annual network bill impacts over AA5 for RT20

Representative end-user	Annual change FY22 to FY23	Annual change FY23 to FY24	Baseline $/year FY24	Annual change FY24 to FY25	Annual change FY25 to FY26	Annual change FY23 to FY27	Annualised change over AA5
Low consumption end-user	*0%*	*11%*	*1,066*	*6%*	*0%*	*5%*	***5%***
Medium consumption end-user	*0%*	*9%*	*1,422*	*6%*	*0%*	*5%*	***5%***
High consumption end-user	*0%*	*8%*	*2,042*	*5%*	*0%*	*5%*	***4%***
Typical solar end-user	*0%*	*8%*	*1,945*	*5%*	*0%*	*5%*	***5%***
Typical non-solar end-user	*0%*	*7%*	*2,258*	*5%*	*-1%*	*5%*	***4%***

RT22 – Multi part time of use energy business

The customer network bill impacts for RT22 over AA5 is shown in Table 5.15.

Table 5.15: Annual network bill impacts over AA5 for RT22

Representative end-user	Annual change FY22 to FY23	Annual change FY23 to FY24	Baseline $/year FY24	Annual change FY24 to FY25	Annual change FY25 to FY26	Annual change FY23 to FY27	Annualised change over AA5
Low consumption end-user	*0%*	*12%*	*910*	*6%*	*0%*	*5%*	***6%***
Medium consumption end-user	*0%*	*10%*	*1,299*	*5%*	*-2%*	*5%*	***5%***
High consumption end-user	*0%*	*9%*	*1,989*	*5%*	*-3%*	*5%*	***4%***
Typical solar end-user	*0%*	*9%*	*1,856*	*6%*	*-3%*	*5%*	***4%***
Typical non-solar end-user	*0%*	*8%*	*2,233*	*5%*	*-4%*	*5%*	***4%***

RT34 – Super off-peak energy business

The customer network bill impacts for RT34 over AA5 is shown in Table 5.16.

Table 5.16: Annual network bill impacts over AA5 for RT34

Representative end-user	Annual change FY22 to FY23	Annual change FY23 to FY24	Baseline $/year FY24	Annual change FY24 to FY25	Annual change FY25 to FY26	Annual change FY23 to FY27	Annualised change over AA5
Low consumption end-user	*0%*	*9%*	*855*	*5%*	*0%*	*5%*	***5%***
Medium consumption end-user	*0%*	*6%*	*1,173*	*4%*	*0%*	*5%*	***4%***
High consumption end-user	*0%*	*4%*	*1,718*	*4%*	*-1%*	*6%*	***3%***

Typical solar end-user	*0%*	*4%*	*1,787*	*4%*	*-1%*	*6%*	***3%***
Typical non-solar end-user	*0%*	*4%*	*1,950*	*4%*	*-1%*	*6%*	***3%***

RT36 – Super off-peak demand business

The customer network bill impacts for RT36 over AA5 is shown in Table 5.17.

Table 5.17: Annual network bill impacts over AA5 for RT36

Representative end-user	Annual change FY22 to FY23	Annual change FY23 to FY24	Baseline $/year FY24	Annual change FY24 to FY25	Annual change FY25 to FY26	Annual change FY23 to FY27	Annualised change over AA5
Low consumption end-user	*0%*	*4%*	*984*	*5%*	*1%*	*4%*	***3%***
Medium consumption end-user	*0%*	*3%*	*1,303*	*4%*	*1%*	*3%*	***3%***
High consumption end-user	*0%*	*2%*	*1,842*	*4%*	*1%*	*3%*	***3%***
Typical solar end-user	*0%*	*2%*	*1,868*	*4%*	*1%*	*3%*	***3%***
Typical non-solar end-user	*0%*	*2%*	*2,057*	*4%*	*1%*	*3%*	***2%***