Appendix F.1

Tariff Structure Statement Overview

Proposed revisions to the access arrangement

1 February 2022

westernpower

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

EDM 58785583

Tariff Structure Statement Overview

1 July 2023

Contents

1. Introduction

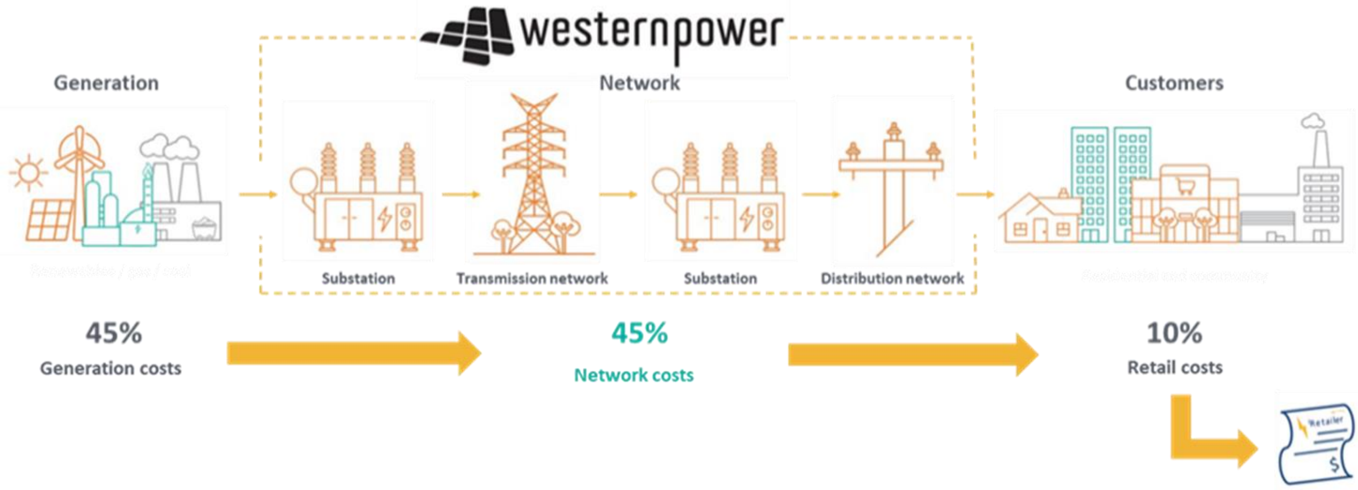
Western Power has prepared this Tariff Structure Statement (TSS) for application in the access arrangement for the period from 1 July 2022 to 30 June 2027 (AA5).

Our TSS provides customers and stakeholders with transparent information on how we set distribution and transmission reference tariffs (tariffs) for the AA5 period.

We also provide an additional technical summary which accompanies this TSS. This technical summary provides further detail regarding Western Power's proposed approach to setting tariffs throughout the AA5 period.

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

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



The Economic Regulation Authority (ERA) sets (approves) the total level of revenue that we expect to recover from customers and we set tariffs to enable us to recover the approved total expected revenue. Our TSS is required to be approved by the ERA through its determination process for our AA5 proposal.

The key implications of how we set tariffs are:

- how the approved target revenue is shared between different groups of customers; and
- how we recover 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 of distributed energy resources (DER).

The requirement to prepare a TSS was introduced to the Electricity Networks Access Code 2004 (the Code) in 2020, alongside 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 each year of AA5, 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, in the meantime, include in our TSS a forecast of the weighted average price change for each tariff over the AA5 period.

The methodology in our TSS will only be applied in the second year of the AA5 period due to the delay in the commencement of the fifth access arrangement to 1 July 2023. As published in the ERA's framework and approach,[1] 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:[2]

> *…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, 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
- customer-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.

1.2 How do tariffs promote economic efficiency?

Our reference tariffs promote economic efficiency by signalling to customers 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 customers our future network costs will:

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

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

[2] The Code, clause 7.3.

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

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

- customers have more control over their electricity use (and bills) than ever before;
- the way customers use our network is changing, as customers support the transition to renewable energy by adopting DER;
- in turn, the drivers of our future efficient costs are changing;
- there is uncertainty as to the services and technology mix that will best meet our customers' needs in the future, and the dynamics that will arise between new technologies.

It is therefore imperative that our tariffs reflect our role as a network service provider, while also best meeting customers' evolving needs. In practice, this means signalling to customers the network benefits and future costs that arise from their decisions.

This promotes equity and fairness by empowering all customers to take control of their network bills and 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:[3]

> *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 role of our network as a platform for sharing and accessing renewable energy, while supporting the evolving needs of our customers.

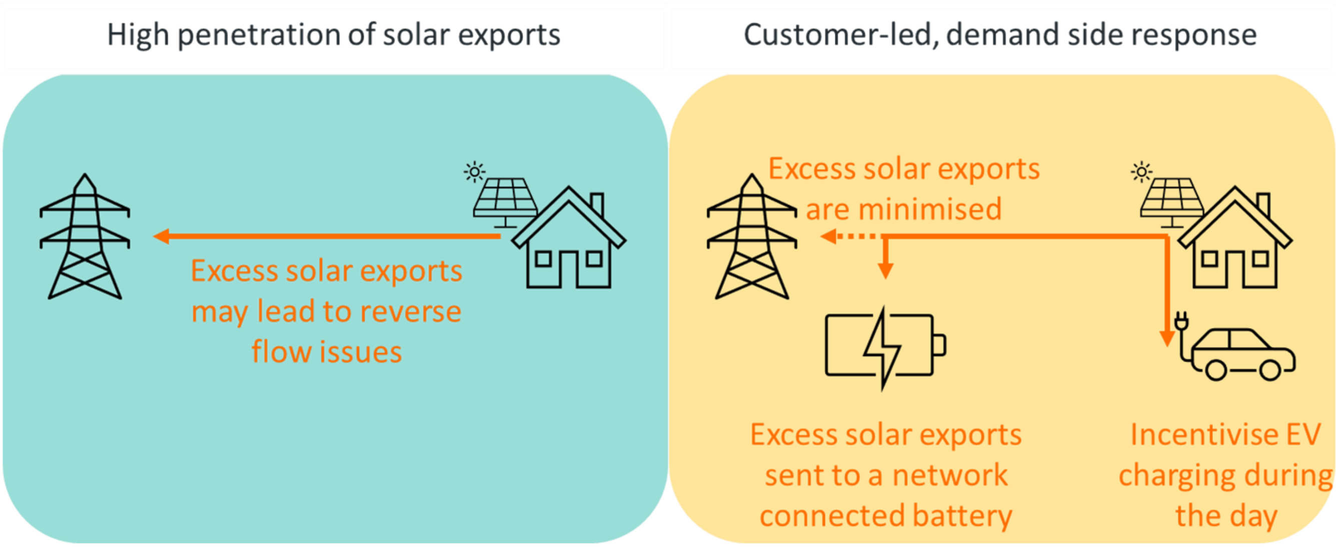
One of our key reforms is therefore to facilitate the increasing role of solar PV in the electricity system.

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

[3] 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.

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



Our other tariff reforms include:

- to set our variable charges at a level that reflects the future cost of using our network at that time;
- to align the revenue recovered from each reference tariff with the total efficient cost of providing that reference service;
- to make these changes gradually to reflect the feedback from our customers;
- to introduce new reference tariffs for large batteries that connect directly to our transmission or distribution network; and
- to introduce a new reference tariff for dedicated electric vehicle (EV) fast-charging stations.

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

Figure 1.3.

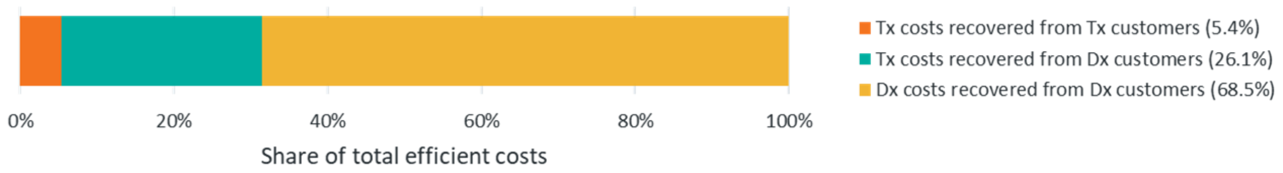
Figure 1.3: Overview of broad strategic direction for AA5

1.4 Combined distribution and transmission prices in AA5

Although our network comprises an electricity transmission and distribution network, and our pricing methodology distinguishes between these two elements of our network, we will publish bundled (combined transmission and distribution) prices for our customers in AA5.[4]

Since the vast majority of our customers are connected to our distribution network, we recover approximately 95 per cent of our total efficient cost, as approved by the ERA, from distribution customers. The cost recovered from distribution customers comprises the cost of our distribution network and a share of the cost of our transmission network, which is also required to serve distribution customers. The remaining cost of our transmission network is recovered from customers that only use our transmission network. We illustrate these circumstances in Figure 1.4.

Figure 1.4: Share of total costs by customer and tariff type



1.5 The structure of our TSS

We have structured our TSS to provide clear and intuitive information for our customers, 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 Two	Background to our TSS	Explains key background information relevant to our TSS, including the importance of tariff reform and feedback from our customers.
Section Three	Our tariff structures	Summarises the definition of the charging components for key reference tariffs (the tariff structure) and introduces our new reference tariffs.
Section Four	How we set prices	Describes the methodology we apply to set the price levels for each reference tariff.
Section Five	Reference tariff change forecast	Presents our indicative forecast of the weighted average annual price change for each reference tariff over AA5.

Our separate, TSS technical summary document contains:

- a description of our estimation process for forward-looking efficient costs;
- an explanation of our methodology for allocating total efficient costs to each reference tariff;
- our approach to estimating stand-alone and avoidable costs as the bounds for revenue recovery of each reference tariff;

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

- the detailed structure of each reference tariff;
- a summary of the price setting 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.

2. Context to our TSS

Our TSS applies a new tariff framework that places a greater emphasis on economic efficiency and the role of customers 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.

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 customer 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.

Against this backdrop, customers 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 more energy efficient and smart appliances.

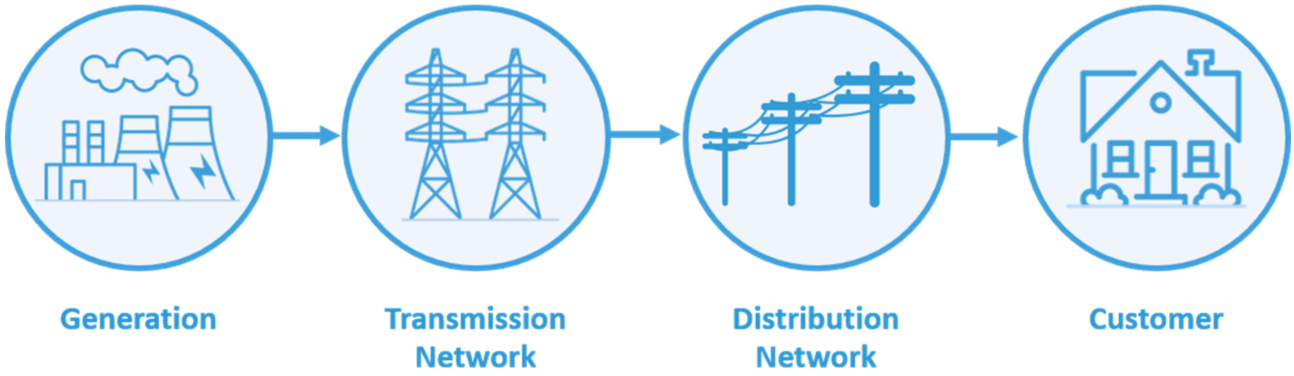
These forces for change are empowering customers to change the way they use our network. For example, customers can:

- generate renewable energy to consume or share with other customers, 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 customer, 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 customer choice whereas, in contrast, our historical role was facilitating the one-way transportation of electricity to customers.

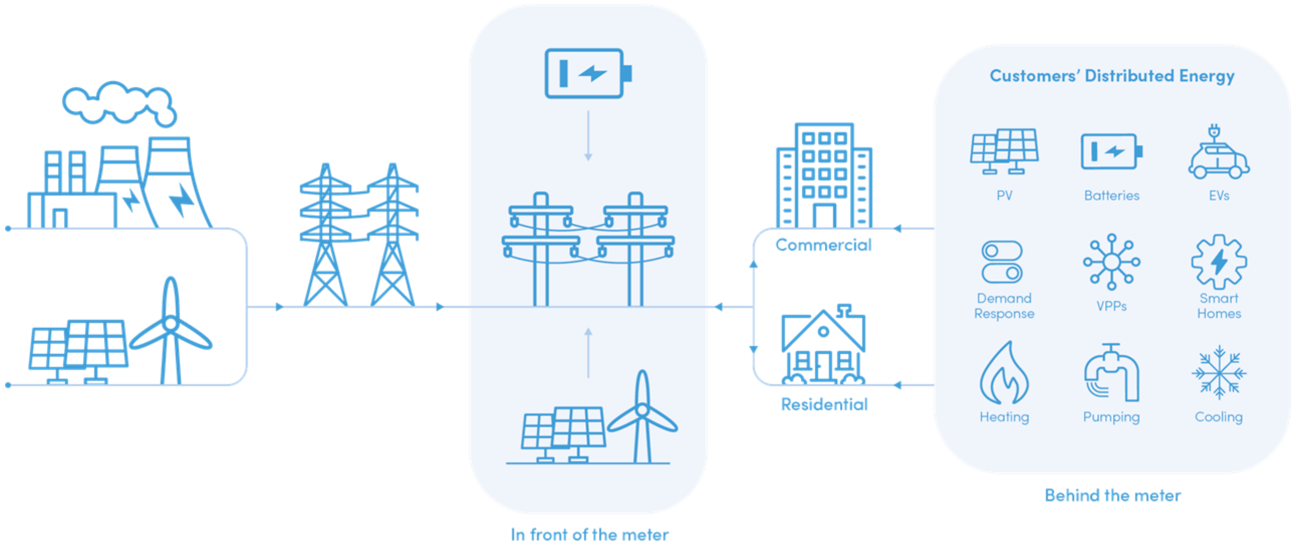
Figure 2.1 and Figure 2.2 illustrate the distinction between our historical and current/future role in the electricity supply chain.

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 customers meant that peak demand was the traditional, primary driver of network costs, ie, additional costs were caused by customers 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 contributed significantly to the sharing of electricity between customers. When other parts of the network are constrained, customer'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 customer exports coincide with periods of low demand. However, because of the broader, non-network benefits of solar PV, we want to encourage customers 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, eg, because there is insufficient load in the local area.

Managing these contemporary network challenges increases our costs. In extreme cases, these costs can lead to the curtailment of a customer'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 customers change the way they use our network, so too are the drivers of our costs.

Some customer decisions that can increase our costs include:

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

Customers are changing the way they use the network, which presents an opportunity to incentivise decisions that can help to lower our costs.

Importantly, there are now also a wider range of customer decisions that can help to lower our costs, eg:

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

We therefore want to encourage customers to make decisions that unlock value for them and lower our costs, which benefits all customers.

The main way that we achieve this outcome in AA5 is by encouraging customers to shift their load to the times of day when solar PV exports are highest, through the adoption of a super off-peak period in new tariffs (see section 3.1).

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 customers' evolving future needs.

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

In light of this uncertainty, it is imperative that our reference tariffs reflect our role as a platform for sharing and accessing electricity, while also best meeting customers' evolving future needs.

This necessitates a technology neutral approach to tariffs, where we signal to customers 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:[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*

[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.

by all consumers. They should also be technologically neutral, simply signalling the costs (and benefits) arising from serving the consumers' use of the network.

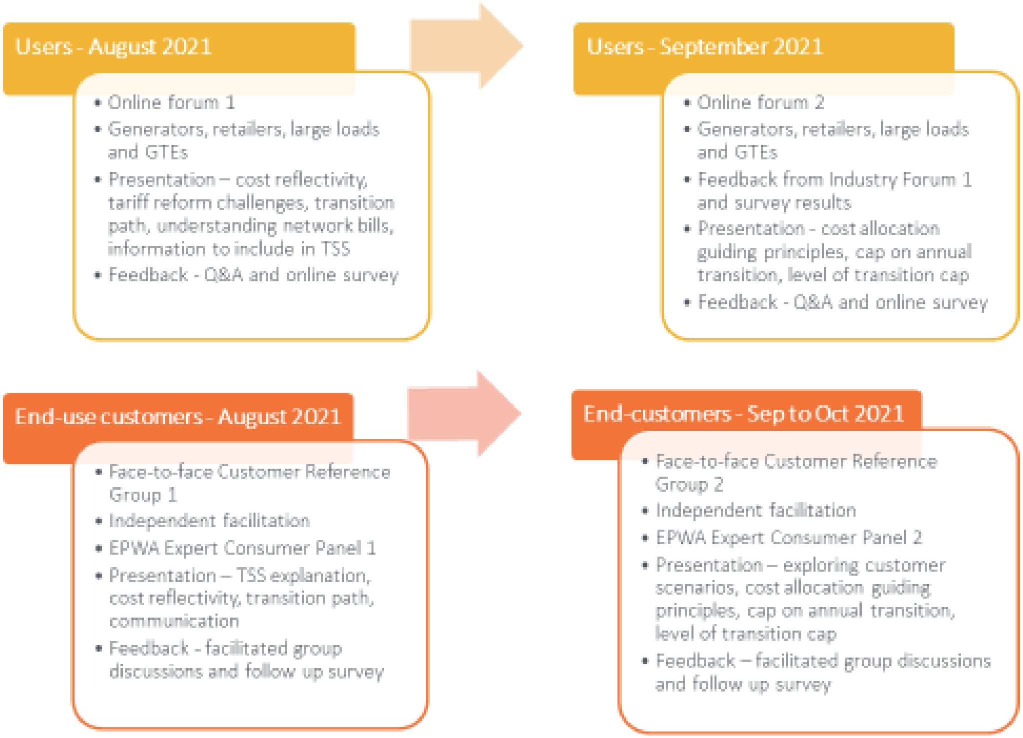
There may be temporary exceptions to the principle of technological neutrality during the early stages of the energy market transformation to support the early adoption of new technologies (such as EVs and fast-charging stations) to mitigate uncertainty around new business models (such as for grid-connected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

Therefore, in line with the ERA's final decision on the framework and approach, we have developed specific tariffs for grid-connected batteries and dedicated electric vehicle fast-chargers.[6]

2.4 Feedback from our customers

We conducted consultation with our users and end-use customers in the preparation of our 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



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

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

Table 2.1: What our customers told us and how we responded

Key theme	What our customers told us	How we responded
Efficiency	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 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 transitioning our variable charges down to levels that signal our future costs, offset by only gradual increases in fixed charges. • 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	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 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 in pricing principle 7.3F.[7]

[7] 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.

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, eg, fixed charges, variable energy charges, variable demand charges and/or capacity-based charging components; and
- the particular specification of those charging components, eg, 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 customers 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 contains variable prices that apply only at certain times of the day. The principal benefit of time of use tariff structures is that they signal to customers how the future costs caused by their energy use change throughout the day, which encourages customers to shift their use to when it doesn't increase our 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.

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

We propose to introduce four new time of use energy tariffs for residential and business customers using either an exit or bi-directional reference service in AA5.

These tariffs enable a customer-led, demand-side solution to address the changing drivers of our network costs. They achieve this by including a super off-peak period with a very low variable energy price, which encourages customers to shift load to times when supply significantly exceeds demand on our network, ie, low load events.

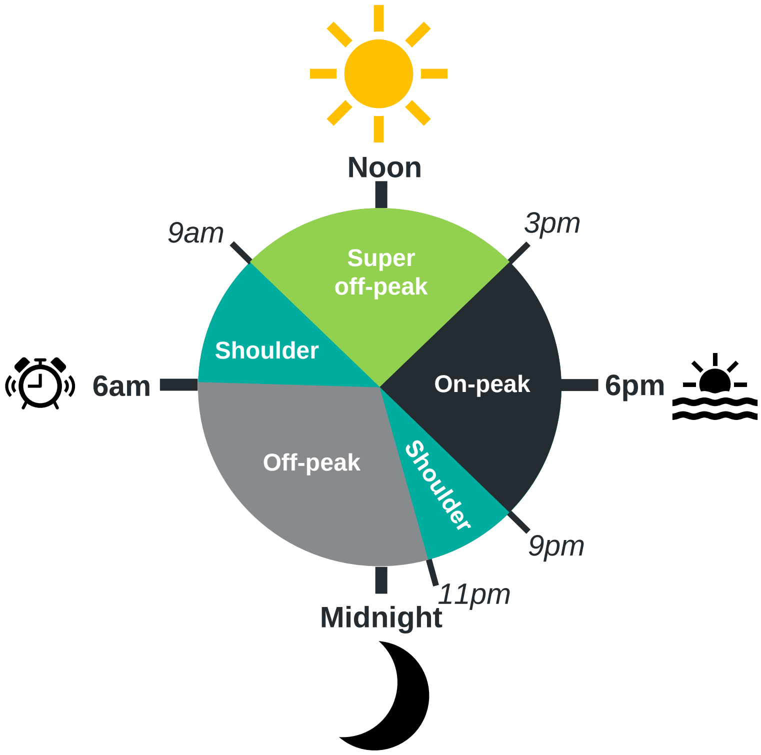
In our view, at this stage in the energy market transformation we should endeavour first to address the future costs caused by low load events through a customer-led, demand side solution. This solution is preferable in the first instance to the alternative of using some form of export price to discourage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

Further, a super off-peak period empowers all customers 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.

The super off-peak period will apply for six hours, from 9am to 3pm every day and involve a price that is significantly lower than our other variable charges.

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



As noted in our response to the ERA's framework and approach issues paper,[8] Western Power considers charging parameters for time of use services should be set at a level that provides strong price signals for periods of peak and low demand. Western Power therefore proposes a strong pricing differential between peak and low demand time bands. An example of pricing differentials based on the current demand observed in the network would be:

- a very low variable rate of close to zero cents per kilowatt hour for electricity consumption during the super off-peak period;
- a low variable rate during off-peak periods;
- a moderate variable rate for shoulder periods, of approximately 1.3 times the off-peak rate; and
- a relatively higher variable rate for consumption during the on-peak period from 3pm to 9pm, approximately 2 times the shoulder rate;
- a fixed charge component.

We will introduce a time of use energy version of the super off-peak period tariff for both residential and small business customers. Since our customers value clarity and simplicity, and these tariffs comprise an advanced charging window structure, we have adopted time of use energy (rather than demand) structures, since price signals based on energy are generally better understood by customers.[9]

This also reflects the AER's conclusion that:[10]

[8] Western Power, Feedback on issue paper – Framework and approach for Western Power's fifth access arrangement review, May 2021, p 15.
[9] For residential and small business customers peak energy and peak demand are closely related, and each approach has its merits. For example, demand-based prices better reflect the principal driver of our future costs, but can also have adverse effects on the diversity in the timing of customers' demand and can be perceived as less easy to understand. On the other hand, peak energy closely aligns with peak demand, is a concept that is generally better understood by customers and results in a price signal that encourages customers to shift load outside of the on-peak period.
[10] AER, Draft Decision | Ausgrid Distribution determination 2019 to 2024 | Attachment 18 Tariff structure statement November 2018, p 70.

> *…we consider that there is no clear cost reflective advantage of adopting demand tariffs over time of use tariffs.*

We explain the structure of these tariffs in more detail in section 5 of the technical summary that accompanies this TSS overview, ie, the:

- Super Off-peak Energy (Residential) Exit service – RT34;
- Super Off-peak Energy (Business) Exit service – RT35;
- Super Off-peak Energy (Residential) Bi-directional service – RT36; and
- Super Off-peak Energy (Business) Bi-directional service – RT37.

We will continue providing customers with our existing time of use 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 services will be closed for new customer nominations. Existing customers on these existing time of use services will transition over time to the new time of use services and tariffs (as discussed above) as users transition to alternative reference services.

3.2 New tariffs for grid-connected batteries

Grid-connected batteries 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:

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

The range of value streams available to grid-connected batteries and their large size also means that they can impose significant costs on the network if the value of those other streams exceeds the future cost they impose on our network.

In line with the ERA's final decision on the framework and approach,[11] we have included in AA5 specific tariffs for grid-connected batteries to ensure they operate efficiently on our network:

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

Grid-connected batteries can impose costs on the network when accessing other revenue streams. 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 customer) providing the service that is most highly valued by the electricity supply chain, which may not necessarily be network services.

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

In this context, the role of our tariffs is to provide a battery with a price signal that enables it to decide whether the provision of network services or other services will produce the highest benefit to the electricity market.

The potential for grid-connected batteries 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 customers do.

In the NEM, the AER has maintained a technology neutral approach to network tariffs, such that they are assigned to standard tariffs and make a contribution to recovering the total efficient cost of the network. The AER explained in April 2021 that:[12]

> *…our final decision is to not approve the revised proposals for grid scale storage from the Victorian distributors. Instead we will maintain the status quo with battery capacity that provides non-network services being assigned to tariff classes and structures in the same manner as any other customer with a similar connection to and use of the network.*

The structure of each of these three new reference tariffs is consistent with that applying to similar connections at the same level of the network.[13]

Consistent with our approach for existing bi-directional distribution-connected customers, we will not charge distribution-connected storage systems for exporting energy into the grid. This reflects that we want to encourage the uptake of storage systems and our preference for a customer-led, demand-side solution to address the costs that may arise from customer exports.

A detailed description of the structure of our transmission and distribution-connected grid-scale battery tariffs is contained in section 5 of the technical summary that accompanies this TSS overview.

3.3 New tariffs for dedicated electric vehicle charging stations

In line with the ERA's final decision on the framework and approach,[14] we are also including a new, technology specific tariff for dedicated EV charging stations.

A key challenge with dedicated electric vehicle fast-charging stations arises from the tension between:

- their potential to impose significant future network costs, due to their very high demand; and
- their low utilisation during the initial uptake of electric vehicles, which can inhibit their ability to pay for the costs they impose on the network.

To reconcile these tensions, the ERA requires us to provide a specific tariff to support dedicated EV fast-charging stations.[15]

The structure of our new reference tariffs for dedicated EV charging stations is consistent with our existing metered demand tariffs (RT5 and RT6). The structure comprises:

- a fixed, daily charge for access to our network that is based on the rolling 12 month maximum half-hour demand, which is eligible for an energy use related discount;

[12] AER, *Final Decision – AusNet Services, CitiPower, Jemena, Powercor, and United Energy Distribution Determination 2021 to 2026 Attachment 19 Tariff structure statement*, April 2021, p 18.

[13] The reference point for the low voltage distribution storage service tariff is the Multi Part Time of Use Energy (Business) Bi-directional service (RT37). The reference point for the high voltage distribution storage service tariff is the high voltage metered demand tariff (RT5). The reference point for the transmission storage service tariff is the individually calculated transmission reference tariffs (TRT1 and TRT2).

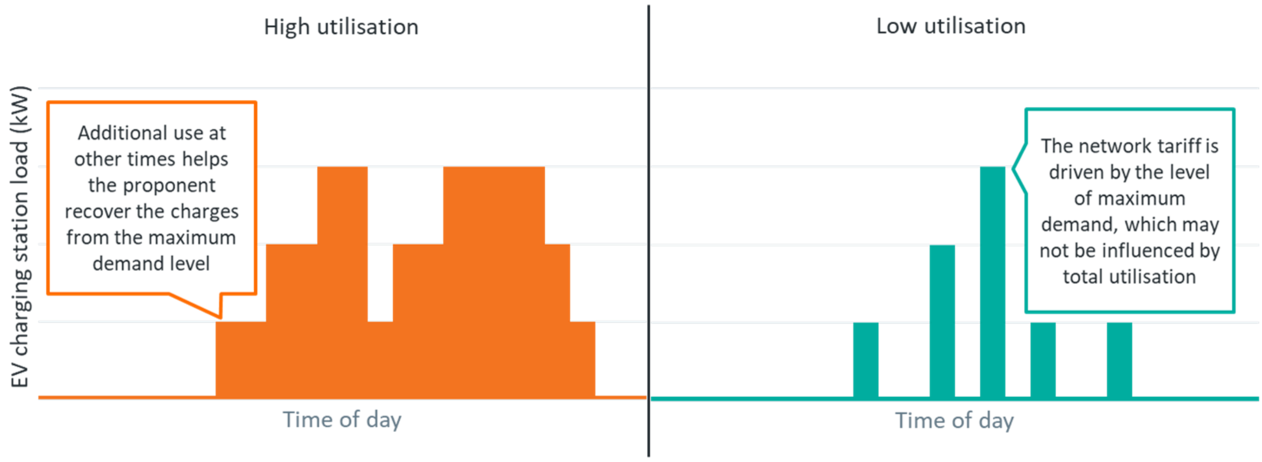
[14] ERA, *Framework and approach for Western Power's fifth access arrangement review – Final decision*, 9 August 2021, p 20.

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

- a variable demand based charge that applies to the rolling 12 month maximum half-hour demand in excess of pre-determined demand thresholds, which is eligible for an energy use related discount;
- a variable charge applied to the electrical distance between the relevant connection point and the closest zone substation, which varies by reference to the measured electrical distance and the rolling 12 month maximum half-hour demand;[16] and
- a fixed, daily metering charge that reflects the metering reference service we provide to these customers.

We describe the structure of our tariffs for dedicated EV fast-charging stations in more detail in section 5 of the technical summary that accompanies this TSS overview.

Figure 3.2: Indicative comparison of high and low utilisation of EV charging services



[16] This charge is referred to as a 'demand length' charge. When a new distribution generator connects, this charge provides an incentive to choose a connection point as close as possible to the nearest zone substation.

4. How do we set prices?

How we set prices for tariffs has no effect on the level of revenue we expect to recover from our customers, which is based on our efficient costs and is approved by the ERA.

However, setting prices is important for our customers because it is how we:

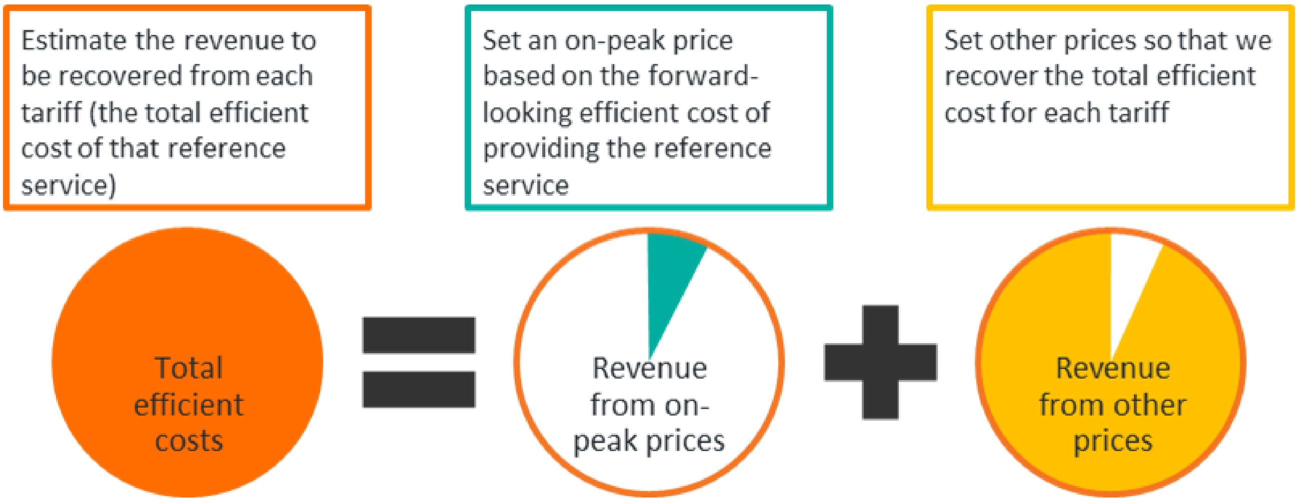
- promote the efficient use of our network and the transition to renewable sources of generation, which benefits all our customers; and
- determine the share of our efficient costs to be recovered from different customers.

At a very high level, our approach involves:

- setting a price for each reference tariff – typically the on-peak price[17] – 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 (in total) recover the 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.

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 a customer decision. For instance, a key figure in the history of efficient pricing, Alfred E. Kahn, explained that instead of focusing on historical costs, efficiency:[18]

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[17] 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.

[18] Kahn, A, *The economics of regulation: Principles and institutions*, Massachusetts Institute of Technology, volume one, p 98.

> *…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 tariff reform in Australia has been on signalling to customers the effect of their decisions on future network costs.

This also reflects the efficiency-based pricing objective in the Code and the more specific requirement that:[19]

> *Each reference tariff must be based on the forward-looking efficient costs of providing the reference service to which it relates to the customers 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 customers to use our network when it does not cause additional future costs;
- ensure that customers that do use the network when it imposes future costs are willing to pay for those costs;
- enable customers to decide whether an installation on their premises (eg, solar PV, batteries or more efficient appliances) or a change in their behaviour can better meet their needs (or other customers' needs) at a lower cost; and
- indicate to Western Power where customers 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.

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, as customers 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.

[19] The Code, clause 7.3G.

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 a customer to use our network when the benefit they derive outweighs the additional costs that they cause.[20] If a customer 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 customers from using the network even when the benefits outweigh the costs – which is a less than efficient outcome.

We are transitioning our peak prices down to the efficient level through time to manage the potential effects on our customers and send appropriate price signals, consistent with the feedback we received from customers. In setting peak prices, we also consider the need to retain a differential between peak and other variable prices that is sufficient to encourage customers to shift load from the peak period into the off-peak and super off-peak periods

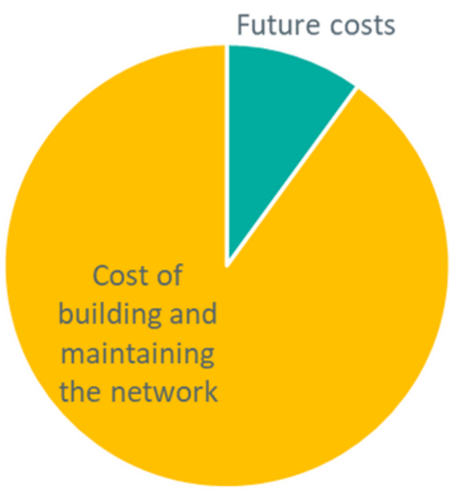
This is because, to preserve the efficiency gain from reducing on peak prices or broadening the gap between the peak prices and the prices for other non-peak time bands, the lost revenue needs to be offset by a commensurate increase in the fixed charges, which can have adverse effects on certain customers. The alternative option of applying this offsetting price increase to other variable prices would mean that those prices depart further from the future costs caused by using the network outside the on-peak period, which are at or very close to zero.

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 customers. 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 customers' 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.

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.

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

4.2.1 Our overarching framework

When combined with our 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.

We achieve these outcomes by:

- allocating our efficient costs (approved by the ERA) across our reference services, thereby calculating the total efficient cost of providing each reference service; 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 calculate the total efficient cost of providing each distribution reference service in further detail in section 3 of the technical summary that accompanies this TSS overview.

An upper and lower bound

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

- no more than the efficient cost of providing that service alone (the stand-alone cost) – if those customers 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 customers were charged less than the avoidable cost then the business would not be recovering the costs incurred to supply the customers, and the shortfall in revenue would have to be recovered from other customers.

For more detail, we explain how we estimate stand-alone and avoidable cost in section 4 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,[21] whereas Ausgrid (a network service provider in New South Wales) approved approach is:[22]

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

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

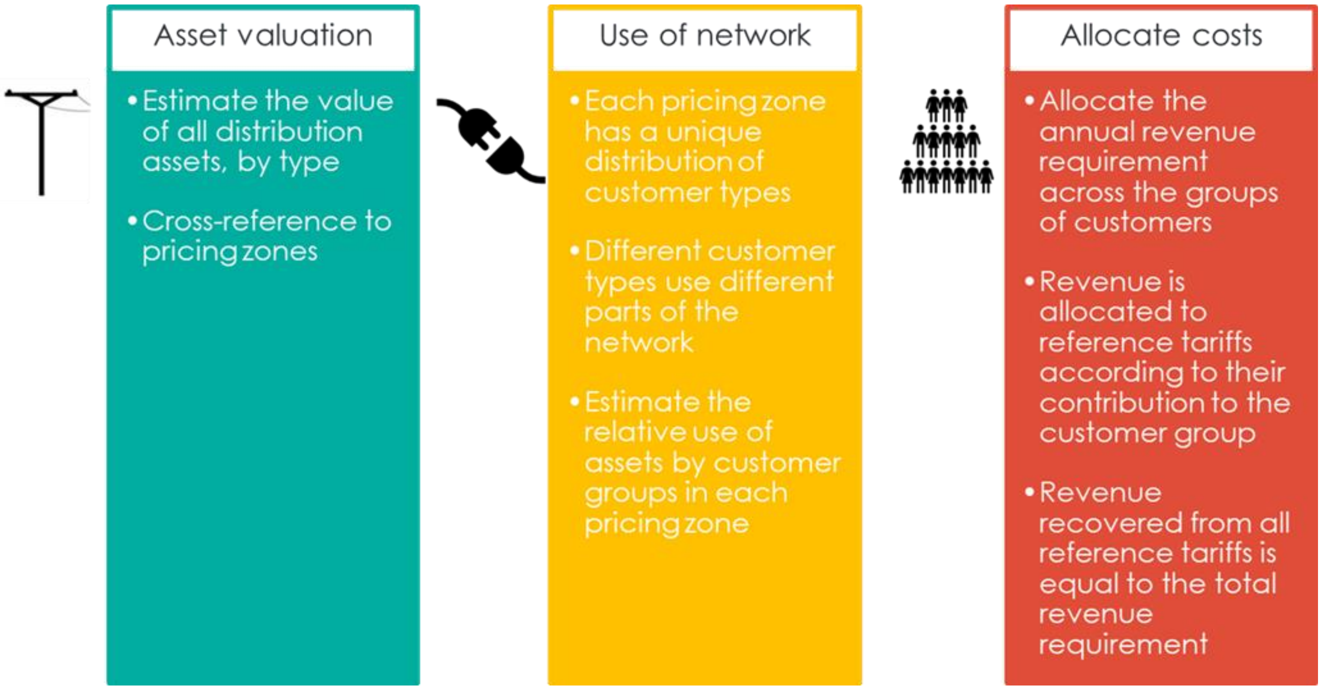
These allocation methodologies have not been an area of focus for tariff reform in the NEM, reflecting that the promotion of economic efficiency relies on signalling future costs to customers.

We calculate the total efficient cost of providing each reference service to customers 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.

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

A high level summary of our cost allocation process is detailed in Figure 4.2. We include a detailed description and explanation of this approach in section 3 of the technical summary that accompanies this TSS overview.

Figure 4.2: Overview of cost allocation methodology

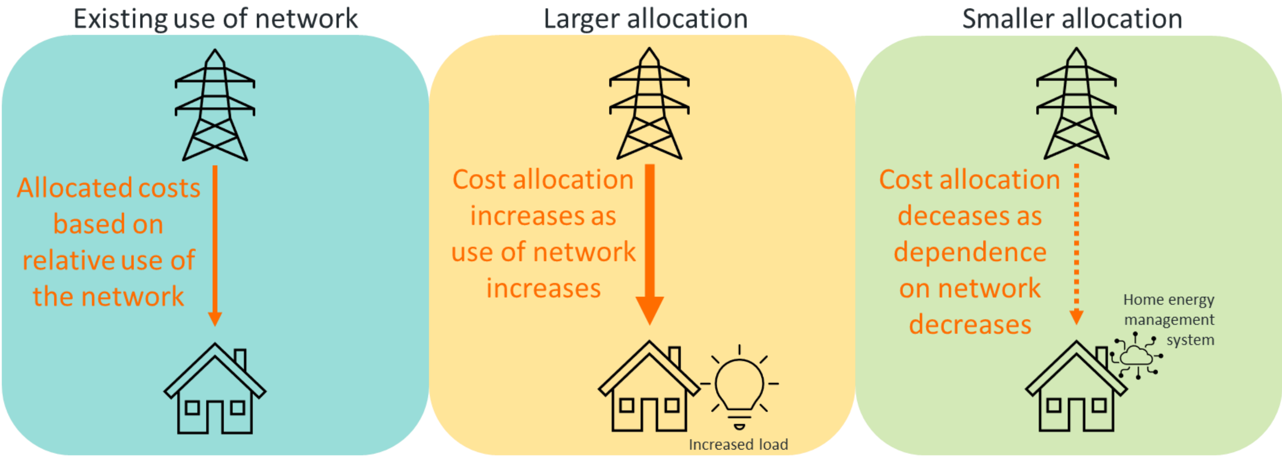


Importantly, our methodology ensures that our allocation of efficient costs reflects the changing way that customers use our network. For example, if customers using a particular reference service change their behaviour to reduce their maximum demand (eg, by shifting their load or investing in energy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

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 customers.

Indicative examples of how our cost allocation methodology may react to changes in customer behaviour are presented in Figure 4.3.

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



We explain our cost allocation methodology in more detail in section 3 of the technical summary that accompanies this TSS.

A transition to manage bill impacts and data improvements

The allocation of our efficient costs to each reference tariff is a key driver of customers' network bills, eg, a five per cent reduction in the allocation of costs to a particular tariff will reduce the average bill for those customers by five per cent.

For this reason we carefully consider the extent to which there is any difference between our estimate of total efficient costs for each reference tariff, and our current allocation of costs to that 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 allocation; and/or
- historical differences between the current and efficient allocation of costs.

Feedback from stakeholders emphasised the need to manage the effects of tariff changes on our customers.

In our view, customers' preferences would best be met by transitioning to the efficient allocation of costs through time. This will avoid price shocks and provide customers 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 customers.

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 customer bill impacts.

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);[23] and
- the total efficient cost of providing that reference service (the total revenue to be recovered from that tariff).

The end 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.

Rebalancing away from non-LRMC variable charges

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

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.[24]

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.[25]

Upon the introduction of an equivalent requirement to minimise distortions in the NER, the Australian Energy Market Commission observed that:

> *The AER [Australian Energy Regulator] 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:[26]

> *…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, 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 customers to shift their load outside of the on-peak period, when there is excess capacity available and additional demand causes no future costs; and

[23] 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.

[24] The Code, clause 7.3H(c).

[25] 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.

[26] The Code, clause 7.6(b).

- encourages customers 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 batteries 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 customers 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.

Since we are also required to accommodate the reasonable requirements, or preferences, of users and end-use customers,[27] we propose to apply a gradual transition away from variable charges. We provide further information on this transition in section 5.

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

[27] The Code, clause 7.3F.

5. Prices over AA5

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

- an explanation of how holding prices constant in the first year of AA5 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 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 customer numbers, energy and demand; and
- improving the efficiency of our tariffs, which we propose to implement gradually to manage the effects on customers.

To manage the potential effects on customers of moving to more efficient tariffs, we will aim 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.

The methodology in our TSS will only be applied in the second year of AA5 due to the delay in the commencement of the fifth access arrangement to 1 July 2023. As published in the ERA's final decision on the framework and approach,[28] Western Power's current price list will apply until the revised access arrangement comes into effect. Accordingly, we expect that this will not lead to the recovery of our total efficient costs in year one, which will in turn require the difference to be made up in year two.

Recovering our proposed target revenue over the AA5 period results in a one-off step-change of 3.7 per cent in year two of AA5 and flat from year two onwards.

As summarised in Figure 5.1, the consequence of these circumstances is that we will aim to limit the average change in price, in constant dollar terms, for any tariff to no more than:

- 5.7 per cent in year two, ie, 3.7 per cent increase to recover our proposed target revenue plus two per cent maximum increase to enable rebalancing across tariffs to move towards more efficient tariffs; and
- 2.0 per cent maximum increase in each subsequent year to enable rebalancing across tariffs to move towards more efficient tariffs.

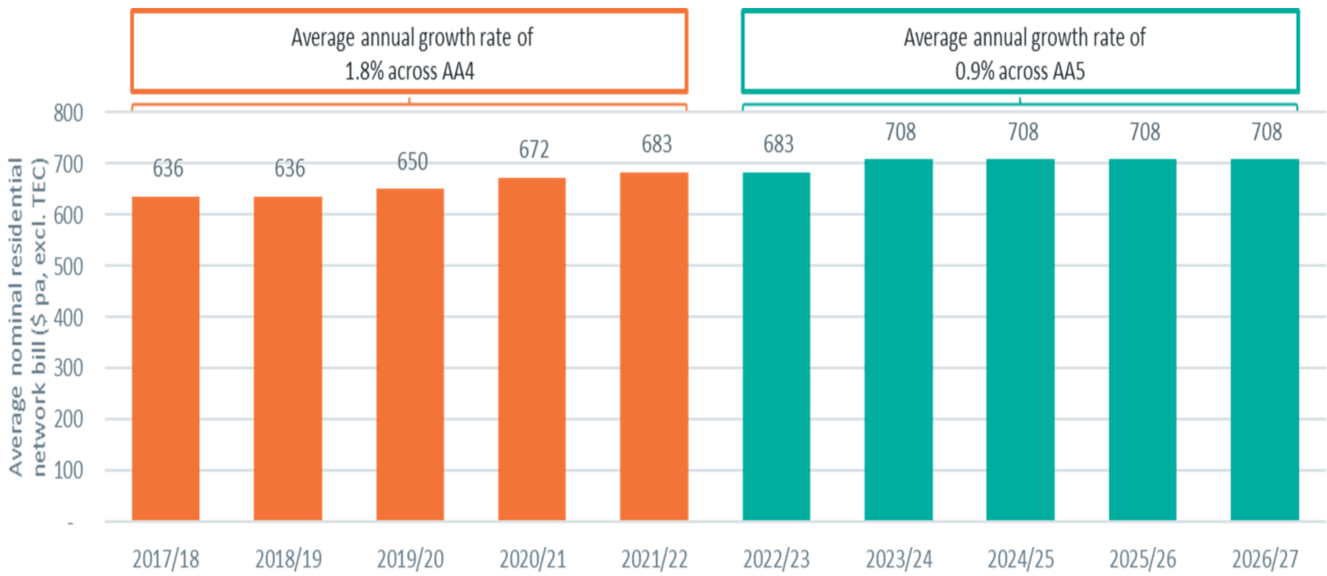
[28] ERA, *Framework and approach for Western Power's fifth access arrangement review – Final decision*, 9 August 2021, p 38.

Figure 5.1: Maximum average price increase for any individual tariff over AA5

It is important to highlight that the target maximum caps above would apply only to tariffs that need to increase in price, and not all tariffs that need to increase in price will increase up to the cap.

For example, we illustrate in Figure 5.2 that the average price for residential customers will increase by only 3.7 per cent in year two – consistent with the change in price required to recover our efficient costs in that year – and will be constant for the rest of AA5 in nominal terms, which is an implicit reduction in price given inflation.

Figure 5.2: Average nominal price outcomes for residential customers



5.2 Forecast weighted average price change for each reference tariff

We summarise in Table 5.1 our forecast weighted average price change for each reference tariff in AA5. We explain the methodology that we apply to derive this forecast in section 7 of the technical summary that accompanies this TSS overview.

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

It is not possible to calculate a forecast weighted average price change for the new tariffs being introduced in the AA5 period as there is currently no published starting point from which to calculate the price change. For these tariffs, Western Power anticipates that once the initial price is established for FY24, the price change for the remaining years will be nil.

Table 5.1: 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%*	*-0.9%*	*0.0%*	*0.0%*	*0.0%*
RT2	**A2 – Anytime Energy (Business) Exit Service**	*0%*	*-0.9%*	*-0.7%*	*-1.3%*	*-1.2%*
RT3	**A3 – Time of Use Energy (Residential) Exit Service**	*0%*	*2.3%*	*-0.5%*	*-1.0%*	*-1.0%*
RT4	**A4 – Time of Use Energy (Business) Exit Service**	*0%*	*5.7%*	*-0.9%*	*-0.9%*	*-0.8%*
RT5	**A5 – High Voltage Metered Demand Exit Service or C5 Bi-directional Service**	*0%*	*-2.4%*	*0.0%*	*-1.6%*	*-1.6%*
RT6	**A6 – Low Voltage Metered Demand Exit Service or Bi-directional Service**	*0%*	*-0.8%*	*-0.5%*	*-1.4%*	*-1.4%*
RT7	**A7 – High Voltage Contract Maximum Demand Exit Service or C7 Bi-directional Service**	*0%*	*-2.5%*	*1.3%*	*0.2%*	*0.2%*
RT8	**A8 – Low Voltage Contract Maximum Demand Exit Service or Bi-directional Service**	*0%*	*-1.2%*	*0.0%*	*-0.8%*	*-0.8%*
RT9	**A9 – Streetlighting Exit Service**	*0%*	*-0.8%*	*2.0%*	*2.0%*	*2.0%*
RT10	**A10 – Unmetered Supplies Exit Service**	*0%*	*3.8%*	*0.0%*	*-1.1%*	*-1.3%*

RT11	**B1 – Distribution Entry Service**	*0%*	*5.1%*	*1.3%*	*-0.4%*	*-0.8%*
RT13	**C1 – Anytime Energy (Residential) Bi-directional Service**	*0%*	*-0.1%*	*-0.5%*	*-1.9%*	*-1.8%*
RT14	**C2 – Anytime Energy (Business) Bi-directional Service**	*0%*	*3.2%*	*-1.0%*	*-1.0%*	*-1.6%*
RT15	**C3 – Time of Use (Residential) Bi-directional Service**	*0%*	*5.7%*	*-0.2%*	*-1.1%*	*-1.6%*
RT16	**C4 – Time of Use (Business) Bi-directional Service RT16**	*0%*	*5.7%*	*-0.4%*	*-0.8%*	*-1.9%*
RT17	**A12 – 3 Part Time of Use Energy (Residential) Exit Service or C9 Bi-directional Service**	*0%*	*5.7%*	*2.0%*	*-0.5%*	*-0.8%*
RT18	**A13 – 3 Part Time of Use Energy (Business) Exit Service or C10 Bi-directional Service**	*0%*	*2.7%*	*-0.4%*	*-1.1%*	*-1.4%*
RT19	**A14 – 3 Part Time of Use Demand (Residential) Exit Service or C11 Bi-directional Service**	*0%*	*5.7%*	*2.0%*	*2.0%*	*1.9%*
RT20	**A15 – 3 Part Time of Use Demand (Business) Exit Service or C12 Bi-directional Service**	*0%*	*0.8%*	*0.1%*	*-1.9%*	*-1.7%*
RT21	**A16 – Multi Part Time of Use Energy (Residential) Exit Service or C13 Bi-directional Service**	*0%*	*5.6%*	*2.0%*	*2.0%*	*1.9%*
RT22	**A17 – Multi Part Time of Use Energy (Business) Exit Service C14 or Bi-directional Service**	*0%*	*4.0%*	*0.4%*	*-1.5%*	*-1.5%*
TRT1	**A11 - Transmission Exit**	*0%*	*5.0%*	*2.0%*	*2.0%*	*0.4%*
TRT2	**B2 - Transmission Entry**	*0%*	*5.7%*	*1.9%*	*1.3%*	*2.0%*