Policy and Regulatory Working Group

Consultation Paper 5

Date: April 2022

TasNetworks | Powering a Bright Future

Contents

Glossary

Term or Abbreviation	Description
ACS	Alternative control services
AEMO	Australian Energy Market Operator
AER	Australian Energy Regulator
BEV[1]	Battery electric vehicle: Vehicles that are solely powered by electricity and do not have petrol, diesel or LPG engine, fuel tank or exhaust. They are also known as plug-in EVs as they use an external electrical charging outlet to charge the battery.
Cost reflective pricing	Pricing which is indicative of the true cost of supplying or providing a service
Customer group	A way of aggregating customers that share similar characteristics, such as usage and behaviour patterns.
DER	Distributed energy resources: This encompasses embedded generation, e.g. solar PVs, batteries, electric vehicles.
Default assignment	Refers to customers being automatically assigned to a specific tariff when either connecting to the network or when their characteristics change (please note: default assignment may occur at different times depending on the distribution network service provider's tariff strategy).
EV	Electric vehicle: A vehicle that derives all or part of their power from electricity supplied by the electric grid. They are powered by electricity rather than liquid fuels.
Embedded Network	Private networks which serve multiple premises and are located within, and connected to, our distribution network through a single connection point.
Embedded Network Customer	The end use customers within an embedded network. These customers are offered connection services and may purchase energy from within the embedded network.
Embedded Network Operator / Owner	The person or person(s) appointed to take care of procurement, billing, collection and customer service. The Embedded Network Operator is typically either the building owner or appointed by the building owner.
Flat rate tariff	A single fixed price for the use of the network, which does not vary with time of use.
HEV	Hybrid electric vehicle: Hybrid vehicles that do not plug-in are not considered an EV
HV	High voltage: High voltage means anything greater than low voltage, i.e. >= 1,000 volts. For the purpose of this document, high voltage commonly refers to electricity usage by large business customers.
ICE	Internal combustion engine: An engine which generates power by the burning of petrol, oil, or other fuel with air inside the engine.
LV	Low voltage: The National Electric Code considers voltages <1,000 volts to be low voltage. For the purpose of this document, low voltage commonly refers to electricity usage of small business or residential customers.
Mandatory assignment	Refers to a type of prescribed tariff assignment where customers must remain on the default network tariff the distributor assigns to them.

[1] https://arena.gov.au/renewable-energy/electric-vehicles/

Term or Abbreviation	Description
Minimum demand on the minimum demand day	The "minimum demand day" identified the day where there was the lowest amount of demand on the network over the financial year. The minimum demand is then the lowest amount of demand at a given point in time on that minimum demand day.
Network tariff	Network price components and conditions of supply for a tariff class
Obsolete	Obsolete network tariffs are no longer available to new installations or able to be applied to an existing installation not already assigned to the obsolete tariff.
Opt in	A type of tariff assignment that occurs when a customer notifies their retailer of their desire to opt into a particular network tariff.
Opt out	A type of tariff assignment that occurs when a customer notifies their retailer of their desire to opt out of a particular network tariff.
PHEV[2]	Plug-in hybrid electric vehicle: Plug-in hybrid electric vehicles are powered by a combination of liquid fuel and electricity. They can be charged with electricity using a plug but also contain an internal combustion engine that uses liquid fuel
Substation	Part of an electrical generation, transmission, and distribution system. Among other important functions, substations connect the high voltage transmission network and the low voltage distribution network – from which our residential customers and the majority of our business customers connect.
Tariff class	A class of retail customers with similar characteristics that are grouped together so that similar customers pay similar prices.
Tariff structure	Refers to the shape, form or design of a tariff, including its different components (or charges), as well as, in some cases, how they interact. Network tariff structures determine how a network operator calculates how much an individual customer is charged for using its network.
ToU	Time of use: A type of cost reflective tariff that applies different prices for electricity at different times of the day, week or year.

[2] https://arena.gov.au/renewable-energy/electric-vehicles/

1. Introduction

1.1. Purpose of this document

The purpose of this paper is to:

- Develop an understanding of embedded networks (EN) and the impact different pricing structures have across different types of embedded networks.
- Explore the impact of future technologies on TasNetworks' distribution network, including how tariffs may be designed to accommodate the expected change in customers' behaviour when utilising distributed energy resources (**DER**).
- Review the peak windows for the small business consumption based network tariff (TAS94) and share our proposal for tariff assignment.
- Provide an update of the proposed changes to our connections policy and alternative control services, specifically components of metering.

1.2. Objective of the workshop

The April workshop continues our conversation on the trends TasNetworks is seeing on the network. We are seeking to:

- Develop an understanding of our customer preferences of adapting network pricing to facilitate increasing levels of DER technology and embedded networks for the next regulatory control period (2024-29).
- Inform our members of the PRWG of proposed changes to TasNetworks' connections policy and alternative control services.

1.3. The Policy and Regulatory Working Group

The Policy and Regulatory Working Group will support the development and submission of TasNetworks' 2024-29 Regulatory and Revenue Proposal by providing advice on regulatory framework, forecasts and pricing strategy development.

Forums are currently forecast to continue on a quarterly basis, and we will monitor and review the frequency and length of the workshops during the later stages of engagement.

2. Executive summary

Our recent *"DER Survey"* shows that our customers are investing in DER technologies in response to environmental changes. Our customers are aware that technology, government policy and environmental considerations (e.g. manufacturing and disposal processes) are evolving. It is anticipated that investment in DER will grow over the next regulatory period and beyond. In response to this anticipated increase, TasNetworks is proposing some changes to the existing residential DER tariff.

TasNetworks is taking a two pronged approach to ensure our pricing keeps pace with technology uptake and changing customer preferences. For the next regulatory period (2024-29) we are proposing to:

- make amendments to the existing residential DER network tariff to accommodate the increasing electric vehicle charging loads at residential properties that sends a price signal to encourage efficient network utilisation within the next regulatory period; and
- undertake an export tariff trial to understand the impact and opportunity of the wider uptake of DER technology on the network. The results of this trial will support further development of pricing options for DER in the 2029-34 regulatory period.

We continue to monitor the alignment of our time of use (ToU) windows with network peaks. There are no substantive proposed changes to our existing ToU windows, i.e. our network peaks continue to occur in the mornings (07:00 - 10:00) and in the evenings (16:00 - 21:00). However, there are two tariffs that we have investigated in which we identified possible changes.

- The ToU consumption small business tariff (TAS94) could be better aligned to reflect the collective load profile of the customers of that tariff class and times of high network utilisation. PRWG members provided feedback that ToU periods that removed the weekend shoulder period was considered to align well with the load profile shown for this group of business customers.
- Analysis from the *"DER Survey"* indicates that residential customers who own batteries and other DER technologies are able to respond to ToU pricing[3]. However, for customers who don't own batteries, consumption patterns are similar to most other residential customers, except that their evening consumption lasts longer and tends to increase as the time of use windows move into off-peak. PRWG members provided feedback that the extension of the evening peak would support the least-cost transition to cost-reflective pricing for DER customers.

Our analysis of embedded networks have identified that the current network tariff structures do not provide equitable outcomes for all our customers. Different embedded network profiles are being investigated to assist us to design the most appropriate embedded network tariff(s).

We have reviewed our Distribution Connections Policy to ensure it continues to meet both our compliance obligations and customer expectations. Whilst there is limited change proposed we would like to discuss an alternate pricing methodology to apply to relocation of assets. We consider there is merit in discussing a methodology that seeks to remove costs from the wider customer base and ensure a more efficient cost signal to proponents of asset relocations.

In respect to alternative control services, we propose to amend our recovery timeline for the metering asset base to align with the timeline for retirement of legacy meters, reducing the risk of customers in the future paying both a capital charge for a retired legacy meter and a charge for an advanced meter

[3] These price responsive customers also tended to be on the ToU consumption tariff (TAS93).

3. Standard control services

3.1. Pricing principles

At our June 2020 forum, members of the PRWG helped develop TasNetworks' pricing principles. These principles continue to guide our discussion regarding tariff reform and development.

Affordable

We offer an essential service and recognise that customers want affordability in the delivered cost of electricity. To support this we will ensure sustainable network investment and that particularly vulnerable customers will not be exposed to hardship as a result of our pricing or network tariff reforms.

Fair

We will provide transparent and cost reflective pricing signals so that all customers contribute to their portion of total network costs.

Simple

Our network pricing will be both cost reflective and easy for our customers, retailers and stakeholders to understand.

Consistent

We will avoid creating price shocks for customers and minimise upward pressure on the delivered cost of electricity.

Innovative

We will investigate innovative solutions that meet the changing needs of our customers and changes in technology.

Choice

We will not stand as a barrier for customers who invest in distributed energy resources, such as solar generation and battery storage. Our pricing will provide choice to our customers to best meet their energy needs, while not imposing on the needs of others or the network.

3.2. Residential DER network tariff

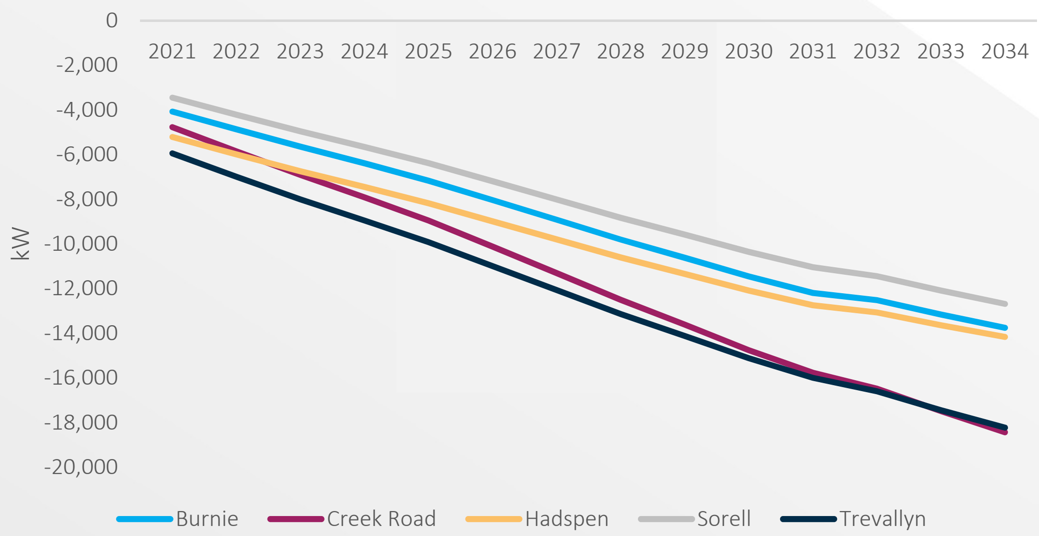
In 2018, TasNetworks introduced a DER tariff for customers with DER technologies – solar PV, batteries and electric vehicles (EVs). The rate of DER adoption has continued to grow since then. Network modelling indicates that much of this new DER will be concentrated in certain parts of the state, which will impact both minimum and maximum demand[4].

Our DER forecasts[5] show that, at the HV feeder level, the net average day minimum demand contribution from DER will increase from -80MW to -203MW by 2029, and the maximum demand contribution from DER will increase to 44MW by 2029 (up from only 5MW in 2021):

- installed solar PV is expected to more than double (from 199MW to 427MW);
- behind the meter batteries will rise to 179MWh of storage capacity; and
- an estimated 10,000 EVs will be on the road by the end of the next regulatory control period

Figures 1 and 2 show the forecast impacts on both net average day minimum and maximum demand for the five most impacted substations.

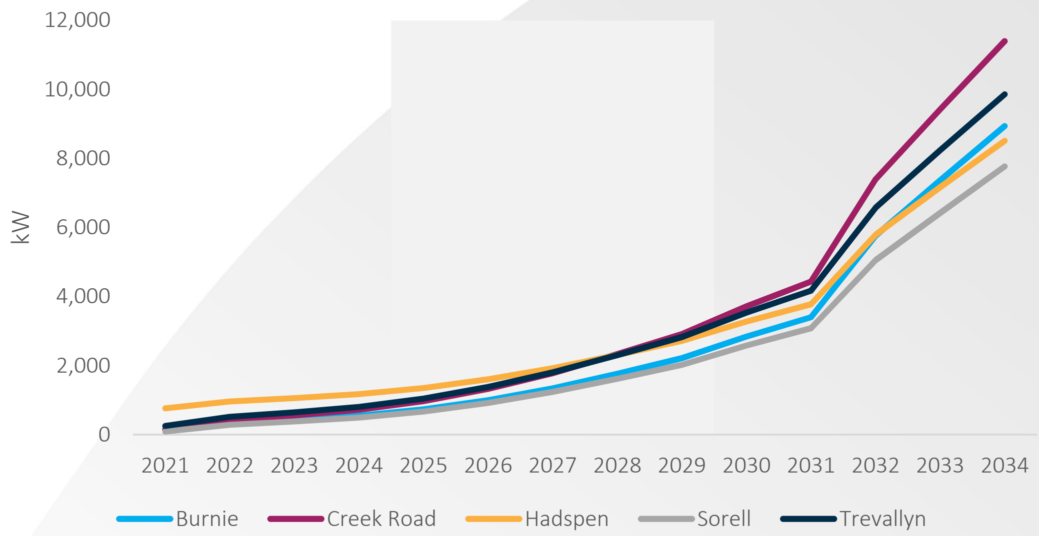
Figure 1 – Forecast net DER average day minimum demand impact



[4] DER forecasts – results and methodology report. Prepared for TasNetworks by CutlerMerz Dec 2021.

[5] Underpinned by AEMO scenario forecasts

Figure 2 – Forecast net DER average day maximum demand impact



At our November 2021 workshop, we presented[6] the load profiles of EV users which showed that customers with battery storage as well as an EV appear quite responsive to time of use price signals. These customers significantly increase their electricity consumption during the week-day off-peak period between the morning and evening peaks, and reduce their consumption just as markedly during the evening peak period.

In addition, anecdotal evidence from industry representations on the behaviour of electric vehicle owners suggest that electric vehicle owners' charging behaviour is:

- often defined by how long they've owned an EV. For example, newer customers have more range anxiety and tend to plug in everyday and/or top up more often than those who have owned their EV for longer;
- driven more by convenience rather than price; and
- the tend to charge *more* in winter months, as batteries have less range when cold.

This responsiveness in customer behaviour coupled with the anticipated growth of EVs, could, if not addressed early, create issues which would require further augmentation of the network.

We are seeking to propose to amend our current DER network tariff to accommodate the anticipated increase in EV charging loads at residential properties that sends a price signal to encourage efficient network utilisation.

Based on customer feedback, stakeholder discussions and network forecasts, we have outlined the following objectives for a DER network tariff:

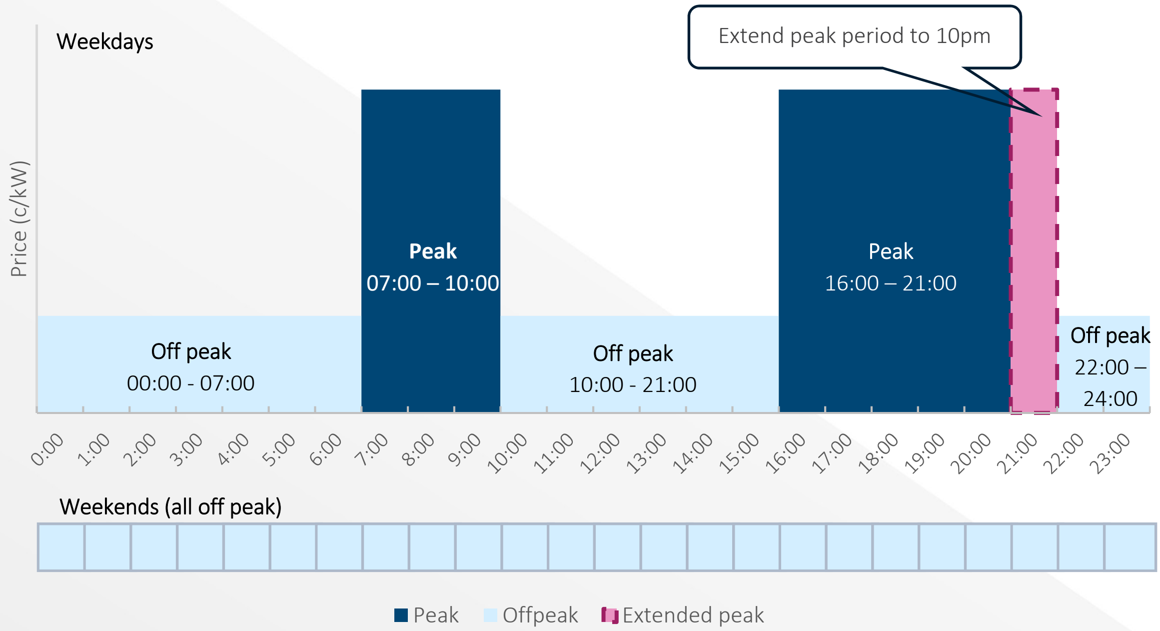
1. Allow greater choice of network tariffs for residential customers.
2. Provide an incentive for residential customers utilise the network in times of low network demand.
3. To encourage more efficient network utilisation to avoid creating a third peak.

We discussed these findings from our survey at the November workshop, particularly the load profiles for EV owners. Feedback received indicated an understanding of the merits and support for extending the evening peak of the current DER network tariff. Noting this would assist TasNetworks to keep pace

[6] Meeting 5 presentation (https://www.tasnetworks.com.au/config/getattachment/2be0b345-fd10-4fbc-b818-495979b440b8/meeting-5-presentation.pdf), page 23

with EV adoption, manage network utilisation and cost pressures, and put downward pressure on the evening peak (Figure 3). This approach will maintain the current DER network tariff structure and extend the evening peak from 9.00pm to 10.00pm based on feedback from the PRWG.

Figure 3 – Existing residential DER demand only tariff with the inclusion of the November 2021 PRWG feedback for extended evening peak



TasNetworks has continued to explore options to determine how our pricing can adapt to our customers' uptake of technology. We have prepared a further three options that include the agreed extended evening peak period that aligns with the objective of the DER tariff, with the aim of encouraging more efficient network utilisation and of increasing customer uptake of the DER tariff.

3.2.1. DER tariff network options

Three possible tariff options, have been explored and are presented for consideration by the PRWG. It is proposed that:

- The core structure of the tariff be changed from a time of use demand to a time of use consumption tariff.
- The evening peak period is extended from 21:00 to 22:00 on weekdays (Mon-Fri).
- A "super off-peak" consumption rate for the hours between 00:00 and 04:00am would be introduced for every day of the week.
- A demand component would be retained, either by way of charging or measuring when demand has exceeded a pre-determined threshold.

Under all these options, the tariff would be charged on a monthly basis. Sections 4.2.1.1 to 4.2.1.3 provide more detail of these proposed tariffs.

Table 1 provides a summary of the key elements of each proposal, key changes are highlighted in red.

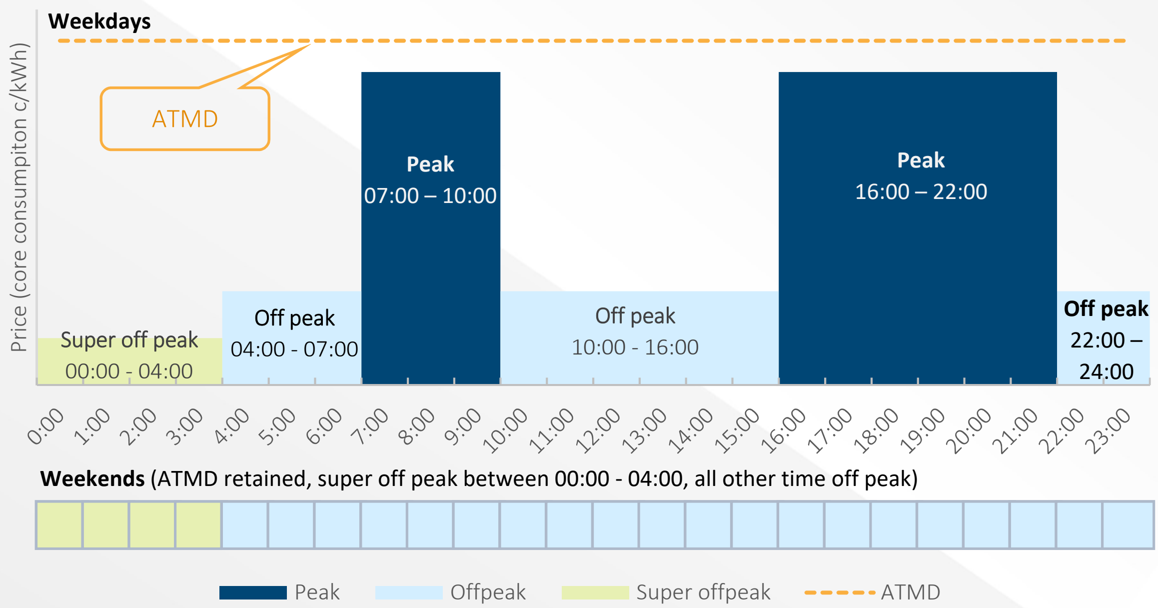
Table 1 – Comparison of the proposed amendments to the DER tariff

	TAS97 **Existing DER tariff**	**Option 1** **November 2021 PRWG**	**Option 2** **Anytime maximum demand**	**Option 3** **Demand threshold and excess demand**	**Option 4** **Demand threshold and excess demand (reduced time frames)**
Core tariff structure	Demand	Demand	Consumption	Consumption	Consumption
Peak periods	Weekdays only (Mon-Fri) 07:00-10:00 16:00-21:00	Weekdays only (Mon-Fri) 07:00-10:00 16:00-22:00	Weekdays only (Mon-Fri) 07:00-10:00 16:00-22:00	Weekdays only (Mon-Fri) 07:00-10:00 16:00-22:00	Weekdays only (Mon-Fri) 07:00-10:00 16:00-22:00
Super off-peak	N/A	N/A	Everyday (Mon-Sun) 00:00 - 04:00	Everyday (Mon-Sun) 00:00 - 04:00	Everyday (Mon-Sun) 00:00 - 04:00
Off-peak periods	All remaining times, including weekends	All remaining times, including weekends	All remaining times, including weekends	All remaining times, including weekends	All remaining times, including weekends
Demand (everyday)	Demand only tariff	Demand only tariff	Anytime maximum demand	24-hour demand threshold with excess demand charges	Demand threshold with excess demand charges. No demand threshold between 10:00-16:00

Option 2 – Anytime maximum demand

Under this option, this type of charge is typically based on the highest half-hourly reading during a month. TasNetworks proposes to calculate the ATMD charge of the DER tariff based on the average of the highest four daily readings throughout a month.

Figure 4 – Option 2: Anytime maximum demand overlay with "core" consumption charges



Option 3 – Demand threshold & excess demand

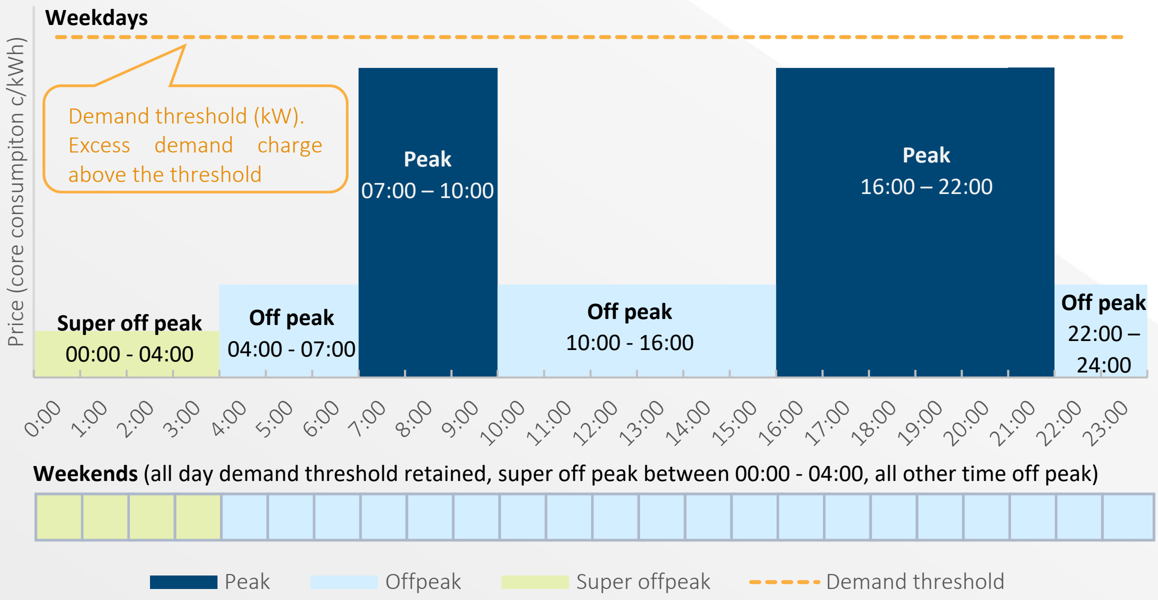
Under this option, TasNetworks would introduce a demand threshold which would apply all day on both weekdays and weekends.

- For any day on which the daily ATMD remains below the demand threshold, no demand related charges would be applied.
- For any day on which the daily ATMD exceeds the demand threshold, an excess demand charge would be applied to the difference between the ATMD and the demand threshold.

This means the excess demand charge is only applied to the proportion of the daily ATMDs that exceed the demand threshold – it is not applied to the total daily ATMDs that exceed the threshold.

Note: this is predominantly a consumption based tariff unless the demand threshold is reached.

Figure 5 – Option 2: Demand threshold & excess demand overlay with "core" consumption charges

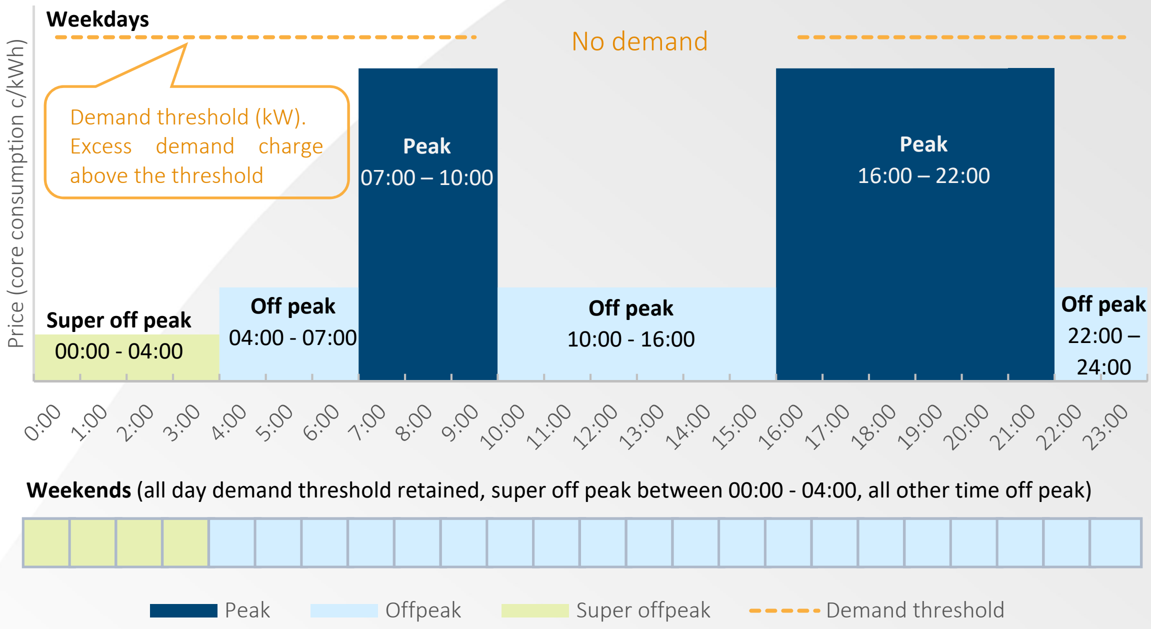


Option 4 – Demand threshold & excess demand (reduced time frames)

This option is similar to Option 3, but the demand threshold would only apply during weekday overnight periods (22:00 – 07:00).

- For any day on which the daily ATMD during the relevant time frames (22:00 – 07:00) remains below the demand threshold, no demand related charges would be applied.
- For any day on which the daily ATMD during the relevant time frames (22:00 – 07:00) exceeds the demand threshold, an excess demand charge would be applied to the difference between the ATMD and the demand threshold.

Figure 6 – Option 3: Demand threshold & excess demand (reduced time frames)



3.3. Export charging proposed trial engagement

TasNetworks seeks to address the integration of DER into the network through trialling technological solutions and innovative pricing options or a combination of both. Export charging would enable TasNetworks to charge for energy exported to the grid during key periods in a day.

We recognise that Tasmanian customers are diverse in how they value export services. To understand how to implement two-way pricing in a Tasmanian-setting, we are considering a network tariff trial in 2024-29.

3.3.1. Background

Successful integration of DER provides benefits for both the network and the customer. For owners of DER, efficient integration would provide the opportunity to maximise the return on their investment. This could range from using their exported electricity to reduce their bills, to accessing and participating in the growing number of new energy services markets – or a combination of both. DER customers could also benefit from a negative charging component or rebates. In these instances, customers can be rewarded for exporting any energy they do not use (or store) themselves when needed by the network.

Efficient integration could also significantly benefit non-owners through lower total system costs. Generation assets (such as solar PV and batteries) could drive down energy costs by providing low-cost energy, as well as ancillary services in competition with traditional providers. For networks, it would facilitate security of the electricity system by rewarding customers who provide support at times of peak demand and discharge at times of low demand.

3.3.2. Proposed engagement approach

Our stakeholder engagement is an evolving process and our approach will continue to mature as we learn and build on our previous engagement programs. We are seeking stakeholder feedback on our initial engagement approach to the development of a two-way tariff trial.

Table 2 outlines the high level phases of the proposed two-way tariff trial.

Table 2 – Two-way tariff trial timeline

2021-23 - Stage 1: Preparation
- DER network tariff developed with stakeholders and export tariff trial engagement plan designed

2023-24 - Stage 2: Planning
- Export tariff trial working group is formed and export tariff trial is designed

2024-27 - Stage 3: Trial
- Commence export tariff trial. Continuously review trial learnings with export tariff trial working group

2026-28 - Stage 4: Final tariff design
- Utilise trial learnings to develop tariff design and implementation approach

2028-29 - Stage 5: Export tariff proposal
- Export tariff proposed in TasNetworks' TSS, applied from 2029

Table 3 outlines the key stakeholder groups that we have identified and the potential methods for engagement.

Table 3 – Two-way tariff trial customer and stakeholder engagement map

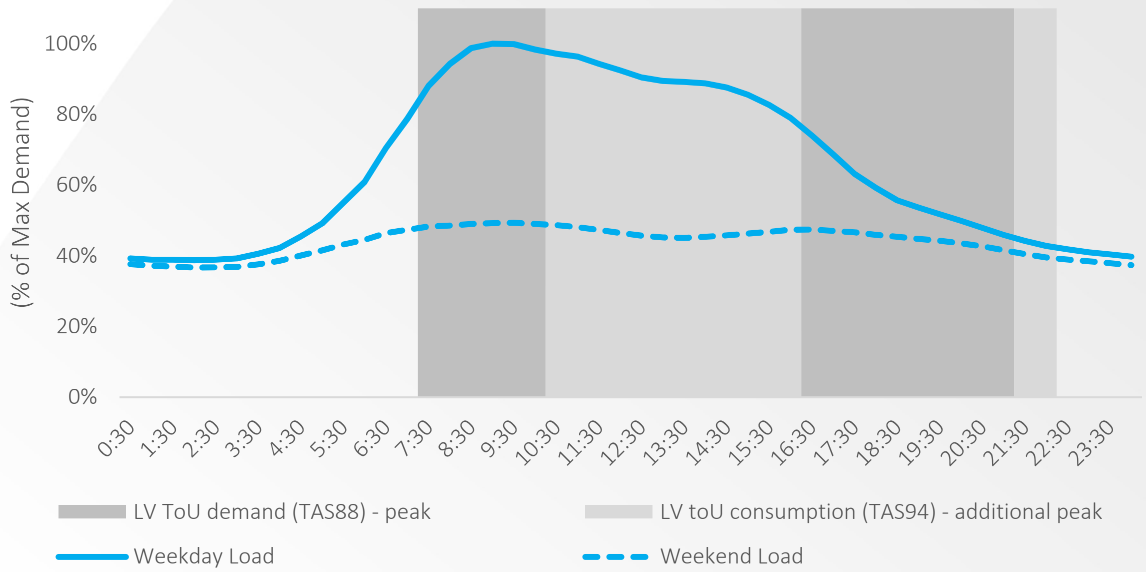
Customers and advocates	Dedicated trial working group
Retailers	Bi-lateral discussions
3rd party aggregators	Stakeholder forums
Vulnerable customers	Social media, surveys
DER customers	Email updates, newsletters, surveys
Businesses	Surveys, written feedback/submissions on approach
Government	Dedicated meetings
AER	Dedicated meetings

3.4. Small business time of use peak window review

3.4.1. Re-cap of discussion

At the November 2021 workshop, we discussed reviewing TasNetworks' time of use periods for the small business time of use consumption tariff (TAS94). The aim of this review was to better align the peak periods for the tariff to the peak periods of the network and the collective load profile of small business customers (Figure 7).

Figure 7 – Small business charging windows – comparison of small business consumption (TAS94 and TAS22) tariffs



In the discussion, it was noted that while small business consumption contributes to peak demand during the network peak periods on weekdays, consumption declines during the afternoon/evening peak period. Over the weekends, overall network utilisation for small businesses is lower than during the week and only fluctuates within a small range.

Three options were put-forward to the PRWG by TasNetworks to gauge support for revised time-of-use windows for the TAS94 tariff.

Option 1: no change, retain the current tariff structure.

Option 2: reduce the duration of the peak period on weekdays to reflect the peak times for the low voltage time of use demand based tariffs for business customers (TAS88 / TAS98, TAS89), and conclude the shoulder period on the weekend at 9pm instead of 10pm.

Option 3: As per option 2, but with the removal of the shoulder period from the weekend entirely.

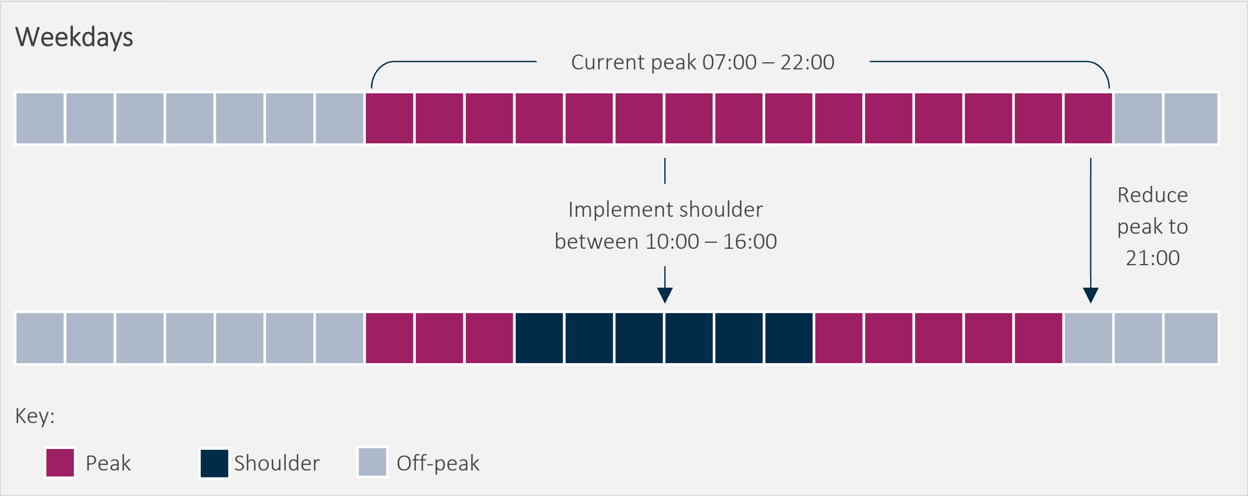
The PRWG was asked to consider the alternatives in terms of their alignment with the pricing principles previously agreed to by the PRWG (i.e. affordability, fairness, simplicity, consistency, innovative and supportive of customer choice).

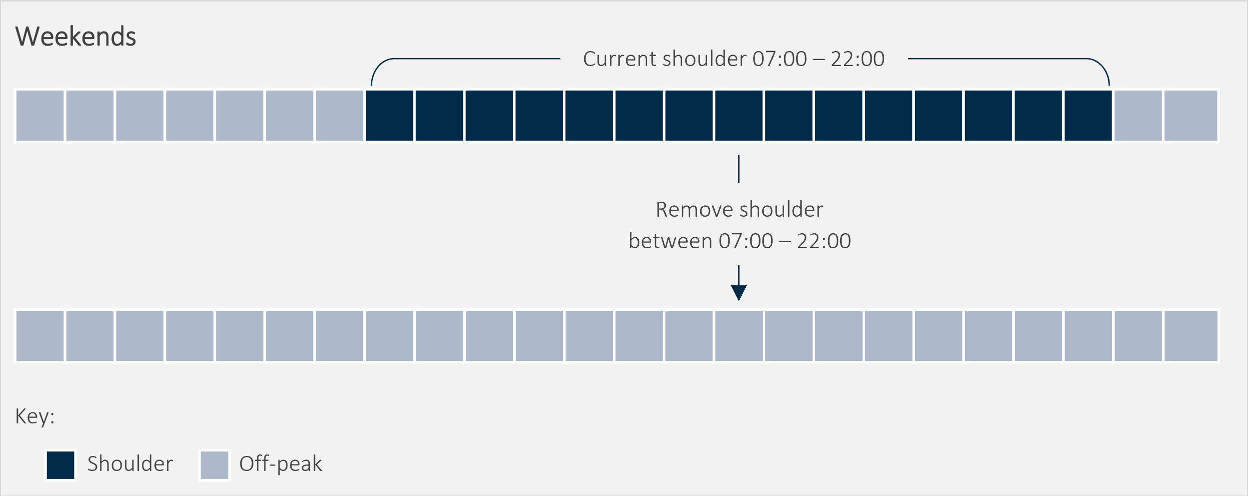
Feedback from PRWG members indicated that option three – one hour reduction of the weekday peak period and the removal of the weekend shoulder period – was considered to align well with the load profile shown for this group of business customers. Option 2 was a close second-base alternative.

3.4.2. Proposed structure for small business time of use consumption (TAS94)

Figure 8 shows the proposed tariff structure for the small business time of use consumption (TAS94) tariff based on the feedback from PRWG members in November 2021.

Figure 8 – Proposed structure for small business time of use consumption (TAS94)





3.4.3. Pricing scenarios

The revenue to be recovered from this tariff needs to reflect the efficient costs of providing the service to its customers. Since the TAS94 tariff is currently recovering close to 100 per cent total efficient cost, the indicative tariffs have been set so that the total revenue recovered under the proposed structure closely aligns to the same revenue under the existing structure.

Table 6 shows the current published prices for the small business time of use consumption tariff (TAS94) for 2021-22 and the proposed prices under three different scenarios.

Table 4 – 2021-22 DUoS prices for TAS94

Charging component	2021-22 published prices	Scenario 1		Scenario 2		Scenario 3	
		Prices	% diff from 2021-22	Prices	% diff from 2021-22	Prices	% diff from 2021-22
Service charge (c/day)	68.909	68.909		68.09		68.909	
Peak energy (c/kWh)	7.844	12.569	25.0%	13.574	35.0%	15.083	50.0%
Shoulder energy (c/kWh) *Relativity to peak*	4.707 *(60.0%)*	7.541 *(60.0%)*	25.0%	7.995 *(58.9%)*	32.5%	7.241 *(48.0%)*	20.0%
Off-peak energy (c/kWh) *Relativity to peak*	1.176 *(15.0%)*	3.142 *(25.0%)*	108.4%	1.960 *(14.4%)*	30.0%	1.659 *(11.0%)*	10.0%

Table 5 provides a summary of the customer impact analysis of all three pricing scenarios. Data from 4,426 small business customers was used in this analysis, representing customers who had interval data from the last 12 months. More detailed analysis by customer size is provided in Appendix A.

Table 5 – Comparison of customer impact for the three scenarios

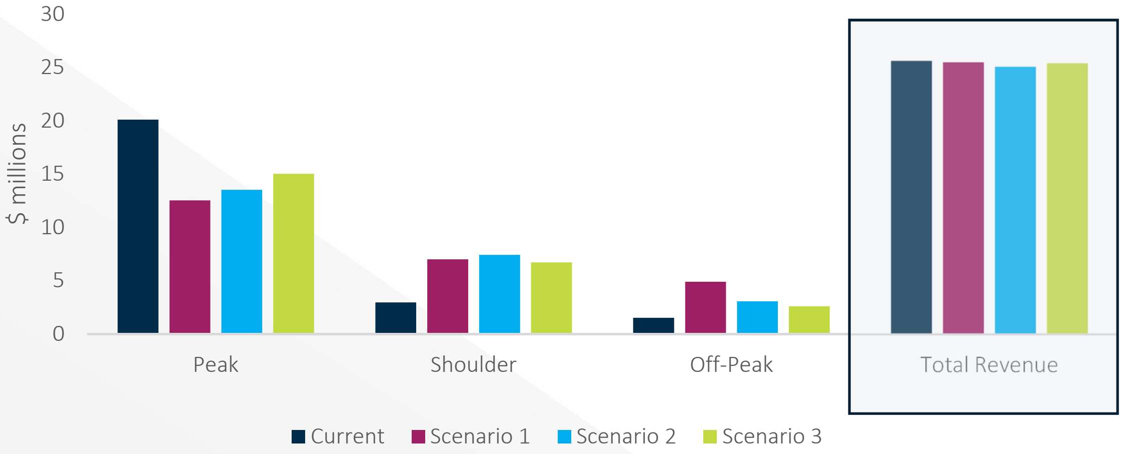
Scenario	Number of customers better off	% of customers	Average annual network charge	Average annual network charge impact
Scenario 1	2,618	59.2%	$5,425	$175
Scenario 2	3,548	80.2%	$4,980	$205
Scenario 3	3,107	70.2%	$4,680	$185

Revenue recovery analysis of scenarios

To comply with the rules, TasNetworks has undertaken a customer impact analysis to determine the customers who are likely to see changes in their network tariff costs as a result of changing the time of use periods.

Scenarios 1-3 provide the revenue outcome required to recover the total efficient cost for the tariff. Figure 9 shows how the distribution of revenue recovered changes between peak, shoulder and off-peak for each of the scenarios.

Figure 9 - Revenue recovery for selected small business customers



3.5. Embedded networks

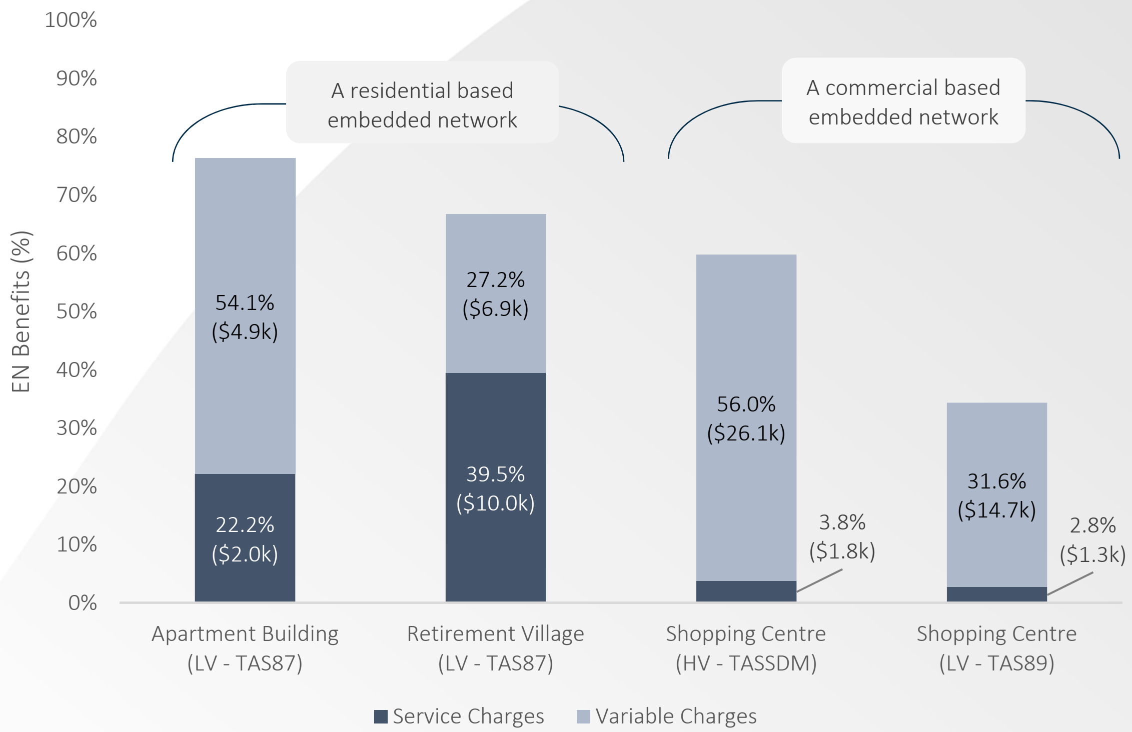
3.5.1. Introduction

TasNetworks' current network tariff suite creates an incentive for embedded network owner/operators to decrease their distribution network charges by forming embedded networks from groups of geographically close individual network end users, for example residents of a retirement village or tenants of a shopping centre.

In creating an embedded network, embedded network owner/operators are able to avoid the fixed daily service charge that is paid by each metered customer by reducing the number of metered customers to just one metered customer[7]. This incentive provides an opportunity for embedded network owners/operators to gain from tariff arbitrage, meaning that some part of efficient costs attributable to the embedded networks are being recovered from other customers – creating an efficiency and equity issue (Figure 10).

[7] Refer to section 4 of the November 2021 PRWG consultation paper (https://www.tasnetworks.com.au/config/getattachment/f7573ac6-9b49-469f-af2c-0faab2d6f39c/meeting-5-consultation-paper.pdf)

Figure 10 – Comparison of LV vs HV embedded networks



3.5.2. Objectives of an embedded network tariff

The proposed objectives of the embedded network tariff are guided by the Rules[8], a review of the AER's draft decision of TasNetworks' proposed embedded network tariff for the 2019-24 regulatory control period and a review of other proposed embedded network tariffs on the NEM.

The proposed objectives focus on the key **efficiency, equity** and **customer impact** requirements that will need to be substantiated to develop a new embedded network.

Proposed objectives

1. Ensure that the allocation recovers the efficient costs (both sunk and forward-looking costs) to embedded network customers and reflect the cost of providing services to those customers.
2. Ensure that other customers using standard control services are not subsidising embedded network customers due to tariff arbitrage.
3. Ensure that customers' network charges within an embedded network are not more than a typical comparable customer outside the embedded network.
4. Incentivise the embedded network to consume electricity in a manner that minimises future network costs.

[8] NER, Clause 6.18.5

3.5.3. Proposed embedded network tariff structure

Components and charging parameters of the proposed embedded network tariff

It is proposed that there would be three key components of the embedded network charge (Figure 11):

- Capacity charge – the charge that is designed to recover the costs that arise from the connection of the embedded network. This will likely be charged on a fixed / daily basis, and will send a price signal that assists customers in making a decision to connect and remain connected to the network.
- Demand charge – this component will be based on the maximum amount of energy used by a customer at a given moment during a particular period (usually an average maximum demand figure to avoid customers being charged on instantaneous spikes).
- Consumption charge – charges based on the energy consumed by the customer (and delivered via the network).

Figure 11 – Components of the proposed embedded network tariff

Charging parameters are also defined for each network tariff component. Consideration will be given in the design of the tariff how usage in embedded networks affects the network at times when the network is working at its hardest. The proposed embedded network tariff will include time of use pricing signals such as peak and off-peak periods.

3.5.4. Capacity charge

Embedded networks can differ substantially from each other, for example, retirement villages, big box stores, shopping centres and apartment buildings are potentially different types of embedded networks, therefore:

- the amount of energy required will differ;
- the profile of each embedded network will differ; and
- the ability to trade on the network, or implement embedded generation with the embedded network will differ.

It is these differences where, during our consultation with PRWG in July 2021, it was identified that a single fixed connection charge would not be flexible enough to support the different types of embedded networks that might exist.

The proposed capacity charge is intended to accommodate the varied types of embedded networks and seeks to provide more flexibility than a set fixed daily charge.

Figure 12 provides examples of embedded networks, the potential size of the capacity allowance and a scaled fixed charge price point. Providing a scale for the fixed charges provides a signal that is simple and flexible for diverse types of embedded networks.

Figure 12 – Examples of types of embedded network capacity charges

Examples for types of embedded network	Capacity allowance		Charge	Network level
	Low voltage	High voltage		
Townhouses or **Lifestyle villages/**	0-30 kVA		$	Low voltage
Townhouse / village or **Apartments** (with or without embedded generation)	30-50 kVA		$$	Low voltage
Apartments (with or without embedded generation)	50-100 kVA	0-100 kVA	$$$	Low voltage/ High voltage
Shopping centre	100^+ kVA	100-250 kVA	$$$$	Low voltage/ High voltage
Large shopping centres		250-500 kVA	$$$$$	High voltage
Big box centres		500^+ kVA	$$$$$$	High voltage

3.5.5. Proposed assignment rules of the embedded network tariff

TasNetworks and the PRWG need to consider customer impacts of implementing a new embedded network tariff to minimise potential bill impacts on customers within the embedded network, and to minimise price shocks for the embedded network owner/operator.

At the PRWG meeting in November 2021, existing embedded network protections were discussed. The following options of assignment rules should be considered:

- All existing embedded networks to remain indefinitely on their existing tariff, unless they choose to move to an embedded network tariff. Once assigned to an embedded network tariff they cannot revert to a non-embedded network tariff.
- All existing embedded network to remain on their existing tariff for the next regulatory period, at which time they are re-assigned.
- All new embedded networks to be assigned to the appropriate embedded network tariff.

3.5.6. Alignment to pricing principles

TasNetworks has identified the following pricing principles to guide the development of the proposed network tariff reform for embedded network for the 2024-29 regulatory control period.

TasNetworks Pricing Principles

The pricing principles outlined in section 6.1 can be applied to a proposed development of an embedded network tariff.

Table 6 – TasNetworks Pricing Principles

Principle	Implications for the proposed embedded network tariff
Affordable	Affordability of the tariff (and all other network tariffs) will primarily be driven by TasNetworks' maximum allowable revenue approved for the 2024-29 regulatory period not a specific issue for the embedded network tariff.
Fair	TasNetworks should recover efficient costs attributable to specific tariffs/tariff classes. Further, customers with the same or similar electricity usage profiles should pay comparable network charges, regardless of whether they are embedded or not.
Simple	Speaks to the design of the embedded network tariff. The tariff should be easily understood by embedded network owner/operators and easily incorporated into retail tariffs.
Consistent	There should be no price shocks for the embedded network owner/operator or consumers within embedded networks that is associated with introduction of the embedded network tariff.
Innovative	The embedded network tariff will not hinder DER within the embedded network due to the capacity and demand price signals built into the tariff.
Choice	There is a trade-off between the principles of 'fair' and 'choice'. An embedded network tariff that is compulsory for new embedded networks increases fairness but decreases choice.

NER Distribution Pricing Principles

The development of the proposed embedded network tariff must comply with the principles set out in Chapter 6 of the Rules. Table 2 discusses the implications of the NER Pricing Principles for the proposed embedded network tariff.

Table 7 – NER Pricing Principles[9]

Principle	NER clause	Implications for the proposed embedded network tariff
Long run marginal cost	6.18.5(f)	The LRMC is the first step to derive the proposed embedded network tariff which can be satisfied by reflecting the LRMC price signal in a maximum demand charging component[10].
Efficient cost recovery	6.18.5(g)	Residual costs will be recovered through a combination of fixed capacity charges and variable volumetric charges.
Minimise customer impacts	6.18.5(h)	*TasNetworks is to agree with the PRWG the assignment policies associated with existing embedded networks to consider vulnerable customers that may live within an embedded network.* Options for assignment are discussed in section 6.2.5 of this paper.
Understandable	6.18.5(i)	The tariff design needs to be easily understood by customers. The tariff structure must also be practical for retailers to accommodate in retail tariffs. *TasNetworks should test the number of capacity tiers with customers, as well as a capacity charge that is a function of the size of the capacity connection*. Refer to discussion in section 6.2.4.

3.6. TasNetworks' tariff strategy progress

	Status	Completed on
Pricing principles	Reviewed	PRWG meeting Jun 2020
Tariff assignment rules	Reviewed	PRWG meeting Jul 2021
Tariff trial principles	Co-designed	PRWG meeting Jul 2021
Tariff trial options	Identified	PRWG meeting Jul 2021
Time of use consumption periods review	Ongoing	
Embedded network tariffs	Ongoing	
Review of residential DER tariff (TAS97)	Ongoing	
DER – tariff trial engagement		

[9] NER Clause 6.18.5(e) is excluded from this table as it discusses the floor/ceiling test of setting a network price which are satisfied mechanically through the pricing model. Additionally, NER Clause 6.18.5(j) regarding jurisdictional requirements is also excluded as it is not applicable to TasNetworks.

[10] The LRMC price signal could incorporate the capacity charging component, but this would provide a weaker price signal (as it is not related to maximum demand).

4. Connections policy

TasNetworks is licensed to provide customer connection services in accordance with the provisions of the electricity laws. Customer connection services are customer initiated services, or works, associated with the:

- establishment of a new connection to TasNetworks' distribution network;
- modification of an existing connection to TasNetworks' distribution network; or
- extension or augmentation of TasNetworks' distribution network in support of a new or modified connection.

The Distribution Connection Policy[11] establishes the requirements for the provision of customer connection services and sets out the circumstances in which TasNetworks will require a connection applicant to pay a connection charge and establishes the basis for determining those charges.

As part of TasNetworks' regulatory proposal development process we review our Distribution Connection Policy to ensure continued suitability, aligned with customer expectations in addition to compliance obligations[12].

Customers requesting a new connection to the shared distribution network, or the alteration of an existing connection, may be required to make a contribution toward the cost of that new or altered connection. This is in addition to the ongoing network charges that the connection and the customer's use of electricity will attract once the connection is energised. The costs charged for these contributions are determined in accordance with the Distribution Connection Policy.

TasNetworks provides three types of connections for customers:

- Basic connections
- Standard connections, and
- Complex connections.

Basic connections are the low-voltage connections used by most residential and small business customers, which suit customers with demand that doesn't exceed 100 amps per phase and are standardised in terms of the hardware required to make the connection. Basic connections are also suitable for customers with micro-embedded generation (such as photo-voltaic solar panels) with output ratings of less than 10 kW (per phase). Basic connections do not involve network upgrades or extensions.

New connections which are more complicated, or differ markedly from a basic connection, are priced on a quoted basis, which reflects the often bespoke nature of the connection and its design, and/or the fact that an extension of the network or network upgrades may also be required to supply the customer's connection. These services are known as 'standard' and 'complex' connections, although TasNetworks has previously referred to these types of connection as 'negotiated' connection services.

Standard connections are generally basic connections plus a network extension service, while complex connections typically involve network augmentation and, potentially but not always, network extension.

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[11] https://www.tasnetworks.com.au/documents/manual-documents/connections/Distribution-connection-pricing-policy

[12] https://www.aer.gov.au/system/files/AER%20-%20connection%20charge%20guideline%20-%2020%20June%202012.pdf

Where customers are required to pay the direct costs associated with an extension services the costs of network augmentation is based on the customer's expected maximum demand. TasNetworks is not proposing any change to the methodology used to develop augmentation rates or the augmentation threshold below which connection proponents are not required to pay augmentation costs.

Table 8 provides an overview of the proposed Distribution Connection Policy amendments for the 2024-29 regulatory control period.

Table 8 - Proposed amendments

Policy Position	Proposed amendment
Connection contracts As specified by the National Energy Retail rules	No change to existing policy
Charging principles The base principles that guide the Distribution Connection Policy	No change to existing policy
Augmentation threshold and rate methodology The rates used to calculate augmentation costs	No change to existing policy
Incremental revenue rebate (IRR) Rebate to reflect a new connections contribution to the TasNetworks revenue over time	Residential calculation updated to use default tariff. Minimal customer impact forecast.
Developer mains scheme Scheme to reimburse connection costs that are utilised by future applicants	No change to existing policy
Asset relocation services Services where existing	Consider removal of accumulated depreciation subsidy
Other connection related services i.e. public lighting, above standard services etc.	No change to existing policy

Incremental Revenue Rebate

Most customers making a new connection to the distribution network will pay network tariffs and thereby contribute to TasNetworks' revenue over time. An assessment of this incremental revenue is undertaken and offset against any up-front contribution by the connecting customer. The revenue assessment considers the relevant incremental revenue arising from the new connection.

Under the current Distribution Connection Policy the IRR is calculated for residential customers using the legacy flat rate light/power and hot water tariffs[13]. Our pricing strategy is based upon a continuing transition to cost reflective network tariffs over time. To support this transitioning we are proposing to update the IRR to reflect an underpinning residential time of use tariff[14]. This will ensure the calculated

[13] Residential general light and power (TAS31) and heating and hot water (TAS41)

[14] Residential time of use consumption (TAS93)

rebate will accurately reflect the network tariff utilised by the customer. Customer impact is provided in Table 9.

The calculation used for small business customers already utilises the business time of use tariff as a result we aren’t proposing a change. Larger connections have a bespoke calculation completed that accurately reflect their tariff and consumption profile.

Table 9 - Residential IRR ($2020-21)

Rebate based on flat rate tariff	Rebate based on time of use tariff
$544.05	$545.46

Asset Relocations

In some instances the provision of a connection service may necessitate the relocation of existing components of the distribution network. Asset relocation services are also commonly requested by parties other than a connecting customer, such as road authorities and local governments, which may require assets to be relocated as part of infrastructure provision. In all instances TasNetworks Distribution Connection Policy outlines the basis TasNetworks will utilise to determine asset relocation charges.

The nature and scope of each service, and its cost, is specific to each job and varies from customer to customer. The cost of providing these services cannot be estimated without first knowing the customer’s specific requirements. When calculating the customer contribution for a requested asset relocation TasNetworks separates the work into what is dedicated for the particular customer (design, asset removal and if required dedicated connection assets) as an alternative control service and work that is required on the shared network (installation of network assets) as a standard control service. Under the existing Distribution Connection Policy the alternative control service costs are fully recovered from the customer and the standard control service costs are subsidised via the offset of accumulated depreciation associated with the removal of shared assets, with the subsidy funded via the broader customer base.

For the upcoming regulatory control period TasNetworks is proposing to remove the accumulated depreciation subsidy, as this subsidy is funded by the broader customer base and not aligned with the principle of cost reflectivity.

Analysis identified that seventy five asset relocation projects of varying scale were completed during 2020-21, all of which attracted the accumulated depreciation subsidy. The total cost of the subsidy to the broader customer base in 2020-21 was $800,000.

With the subsidy currently funded through the network charges applied to all customers, the proposed change in policy will remove undue cost from the wider customer base, while also ensuring a more efficient cost signal is provided to proponents that request asset relocations.

5. Alternative control services

Along with the network services that are central to the supply of electricity, TasNetworks provides additional customer-specific services on request. These services are known as alternative control services and include basic connection services, public lighting, legacy metering services and ancillary network services. Whereas a revenue cap (an annual allowance) is used to regulate or control the price of network services a price cap mechanism is used for the purposes of alternative control services.

For all alternative control services, the aim of TasNetworks' pricing and cost estimates is to recover the costs incurred in providing each service, thereby assuring that only the customer requesting a service is paying for it and the remainder of the customer base is not funding the service.

5.1. Metering Services

On 1 December 2017, retailers became responsible for all new and altered metering arrangements. All new and replacement meters must now be remotely read interval meters (advanced meters). TasNetworks will continue to support the existing fleet legacy meters during the 2024-29 regulatory control period, but will not be involved with the provision or reading of newly installed advanced meters.

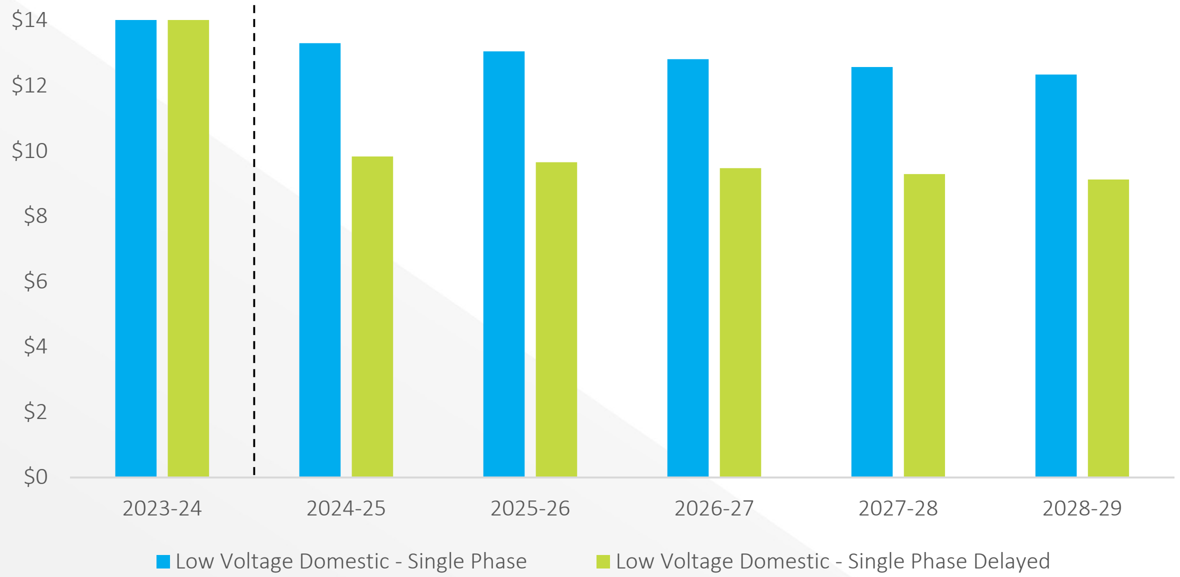
The charges for metering services are split between a capital charge – which recovers the cost of our regulated metering fleet from all customers – and non-capital charge – which covers the cost of reading the meter and collecting the metering data from only the customers with legacy meters.

Since December 2017, Tasmania's largest retailer, Aurora Energy, has embarked on programme of replacing the fleet of accumulation meters that had been provided by TasNetworks with advanced interval meters that are capable or recording, amongst other data, time of use. The replacement of the old meters with advanced meters has occurred at a far faster rate than was anticipated at the time of TasNetworks' last regulatory determination in 2019, and it is likely that virtually all of TasNetworks' meters will have been replaced within the 2024-29 regulatory control period.

However, the current rate at which the cost of those meters is being recovered through capital metering charges is such that TasNetworks will not recover its investment in the now retired meters until possibly the end of the next regulatory control period (2029-34). This would mean customers will still be contributing towards the cost of meters which, in many cases, by 2034 will not have been in service for over a decade.

To reduce the number of customers in the future that are paying both a capital charge for a retired legacy meter and a charge for an advanced meter, TasNetworks is proposing to recover our regulated metering capital costs in full by June 2029. As per figure 5 below this results in a small increase to the proposed capital charge in the coming regulatory control period, while still keeping costs below historical levels.

Figure 13 – Price impacts, single phase meters ($ nominal)



TasNetworks' operational metering costs, that are recovered through the non-capital metering charge, are also forecast to fall over the next regulatory control period as the cost of reading the remaining meters still in service decreases.

TasNetworks has identified that there is not a linear relationship between the volume of legacy meters and forecast operational costs. This is a result of the reduction in economies of scale as the volume of legacy meters declines to low levels.

5.2. Next Steps

We encourage feedback on our plans as it relates to TasNetworks Connection Policy amendments and our proposed metering approach. Feedback can be provided in written form and sent to regulation@tasnetworks.com.au, alternatively dedicated meetings can be arranged to discuss feedback in person.

Appendix A Pricing scenarios for small business ToU peak window review (TAS94)

Appendix A.1. Scenario 1: Increase the peak period and alter the relativities between off-peak and peak

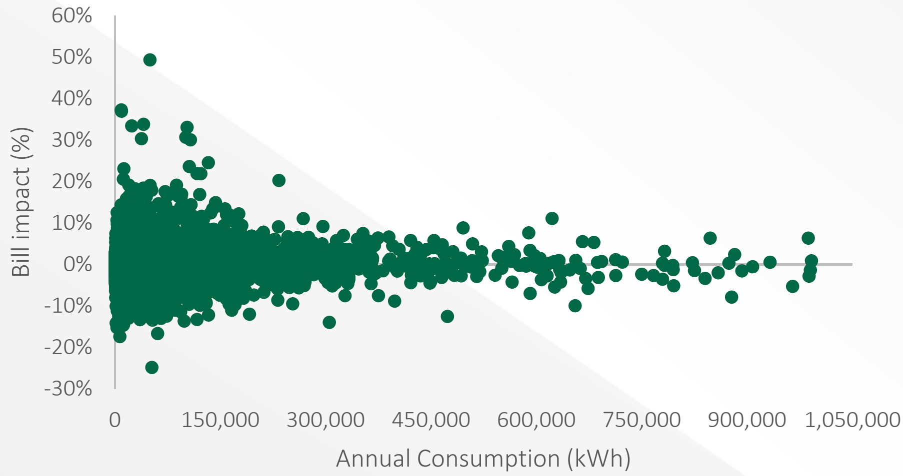
In this scenario, the peak and shoulder prices were increased by 25 per cent. To increase the existing comparably low TAS94 peak to off-peak ratio, and align the ratio more closely with other time of use tariffs[15], the peak price increase was 108.4 per cent. This resulted in a peak to off-peak ratio of 25 per cent (from 15 per cent).

Table 10 – Existing small business customers (Scenario 1)

Customer size	Benefit to small business customers	Customer numbers	% of customers	Average annual network charge	Average annual network charge impact
≤ 10,000 kWh	Better off	818	18.5%	$545	$15
	Worse off by up to 5%	378	8.5%	$500	$10
	Worse off by more than 5%	59	1.3%	$585	$45
> 10,000 kWh	Better off	1,800	40.7%	$7,600	$245
	Worse off by up to 5%	1,044	23.6%	$8,600	$145
	Worse off by more than 5%	327	7.4%	$6,270	$490
Total small business customers		4,426			
Total small business customers better off		2,618	59.2%	$5,425	$175

This scenario disadvantages those customers who consume higher than normal energy during off-peak times e.g. bakeries. Figure 14 shows the network charge impact on customers as a proportion of their network charges.

Figure 14 – Network charge impact ($) for scenario 1



[15] The low voltage business time of use demand tariff (TAS88) has a peak to off-peak ratio of 33.3 per cent and the low voltage residential time of use consumption tariff (TAS93) has a peak to off-peak ratio of 19.5 per cent.

Appendix A.2. Scenario 1: Increase the peak period rate and maintain existing relativities

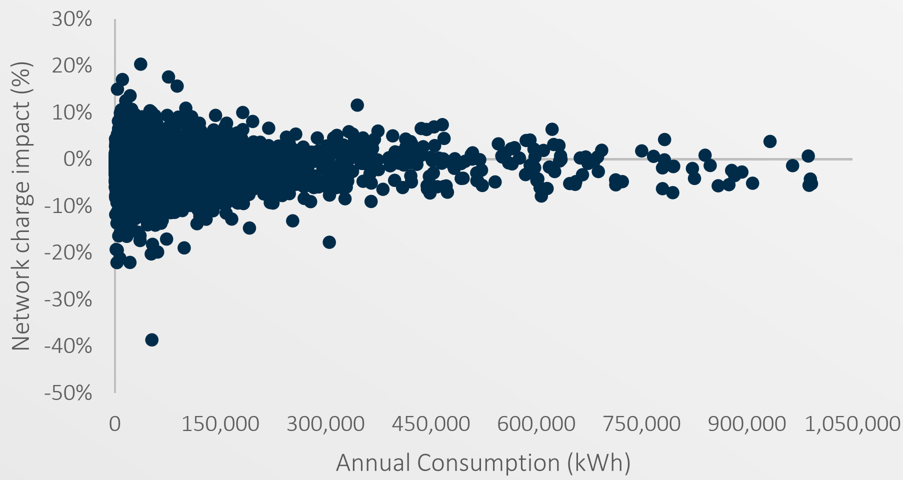
In response to the customers impacted by the proposed prices in scenario two, this scenario seeks to maintain existing pricing relativities, whilst recovering the required revenue to reflect the total efficient cost and maintain the price signals to encourage electricity consumption during non-peak periods.

Table 11 – Existing small business customers (Scenario 2)

Customer size	Benefit to small business customers	Customer numbers	% of customers	Average annual network charge	Average annual network charge impact
≤ 10,000 kWh	Better off	1,086	24.5%	$520	$18
	Worse off by up to 5%	156	3.5%	$560	$8
	Worse off by more than 5%	13	0.3$	$725	$55
> 10,000 kWh	Better off	2,462	55.6%	$6,960	$290
	Worse off by up to 5%	608	13.7%	$10,615	$195
	Worse off by more than 5%	101	2.3%	$8,225	$545
Total small business customers		4,426			
Total small business customers better off		3,548	80.2%	$4,980	$205

Figure 15 shows the network charge impact on customers as a proportion of their network charges.

Figure 15 – Network charge impact as a proportion of network charges for scenario 2



Appendix A.3. Scenario 3: Increase peak by 50 per cent, shoulder by 20 percent and off-peak by 10 per cent

In the final scenario, the peak rate was increased over-proportionally by 50 percent compared to shoulder which was increased by 20 per cent and off-peak increased by 10 per cent. This resulted in further reducing the current ratios between shoulder versus peak, and off-peak versus peak.

Table 12 – Existing small business customers (Scenario 3)

Customer size	Benefit to small business customers	Customer numbers	% of customers	Average annual network charge	Average annual network charge impact
≤ 10,000 kWh	Better off	1,004	22.7%	$515	$17
	Worse off by up to 5%	222	5.0%	$560	$10
	Worse off by more than 5%	29	0.7%	$750	$60
> 10,000 kWh	Better off	2,103	47.5%	$6,670	$265
	Worse off by up to 5%	796	18.0%	$10,230	$204
	Worse off by more than 5%	272	$6.1%	9,490	$675
Total small business customers		4,426			
Total small business customers better off		3,107	70.2%	$4,680	$185

Figure 16 shows the network charge impact on customers as a proportion of their network charges.

Figure 16 – Network charge impact as a proportion of network charges for scenario 3