Executive Summary

This Tariff Structure Statement (TSS) has been prepared by SA Power Networks under the requirements of the National Electricity Rules¹ (NER, or the Rules). It provides details of our proposed approach to network tariffs over the period from July 2017 to June 2020.

Under the National Electricity Market (NEM) regulatory determination approach for Distribution Network Service Providers (DNSPs) like SA Power Networks, our total revenue is set by the Australian Energy Regulator (AER) each five years². With our total revenue capped, our tariffs then represent the way we allocate these total costs to our diverse customer base.

This TSS is accompanied by a plain language overview document that more clearly and concisely explains how we have balanced the requirements of the Rules to pursue economic efficiency with the feedback from our customers and other stakeholders on how and when we should introduce changes.

This TSS represents part of a broader program of reforming our network tariffs over the coming decade. Tariff reform is a national project and so, under the Rule changes, all distribution businesses are required to transition tariffs for all customers towards structures that are more “cost reflective”.

To be cost reflective our tariffs must send price signals that are based on our main costs of providing the shared network. As is the case in most other DNSPs, the relative cost of establishing and sustaining network access to any given customer is largely determined by³:

- Coincident demand - that customer’s contribution to the maximum or ‘peak’ demand on the shared network; and
- Customer density - how many other customers share the same part of the network.

Whilst these are the two main cost drivers for our network, our current tariffs for all but our largest 1% of customers are instead based on the total amount of electricity consumed by each customer each year. These small customers account for about half of all energy consumed in South Australia (SA), and for about two-thirds of the peak demand in summer on extreme days.

With our revenue capped by the AER, changing the basis of our tariffs will inevitably result in a redistribution of costs amongst our small customers. The impacts of this redistribution have been at the heart of our conversations with customers and other stakeholders in preparing this TSS.

For a number of reasons, reforming tariffs to be more cost reflective has very important local considerations that are likely to lead to more pronounced impacts from tariff reform than is apparent in other states.

In the case of reflecting the costs of peak demand, the SA distribution network has the highest ratio of peak to average demand across the NEM distribution businesses.

In relation to customer density, the average number of customers per kilometre of distribution line in SA is the lowest in the NEM. Put another way, we provide more network per customer than the other regions.

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¹ Specifically the Distribution Pricing Rules of Chapter 6 Part I
² The AER released its final determination for the 2015-20 regulatory period in October 2015
³ “meeting demand ... at times of greatest utilisation of the network” and “the extent to which costs vary between different locations” are also reflected in the pricing principles at clause 6.18.5(f) (2) and (3)
We are also the only mainland state to have a single distribution business for the entire state. The South Australian Government has placed a requirement on SA Power Networks to maintain state-wide network pricing for small customers (with annual consumption not exceeding 160 MWh) and to maintain state-wide distribution pricing for large and small customers. This ensures that equity can be maintained despite the NER requirement to reflect cost differences by location eg urban/rural issues.

This is our first TSS and follows a similar style to our annual Pricing Proposals⁴. Subsequent Pricing Proposals are required to be prepared to comply with what we have said in this TSS. Readers are encouraged to read the accompanying plain language Overview Paper that more clearly and concisely explains how we have balanced the many factors we must consider in our pricing.

This TSS has been prepared with best endeavours. We note however that a number of related processes will need to be incorporated in our revised TSS which is scheduled for lodgement with the AER on 2 September 2016:

- This initial TSS will have been lodged with the AER at the start of December 2015.
- The AER’s Final Decision of our allowed annual revenues and efficient costs for the 2015-20 period was made on 29 October 2015. We have incorporated those revenues into this TSS proposal, but the level of revenues is different from that used in stakeholder consultations to date, which were based on the AER’s Preliminary Determination.
- The rules around roles and responsibilities for metering are also changing. The Australian Energy Market Commission (AEMC) delivered its final determination on changes to these rules in late November 2015.
- The Victorian distribution businesses have lodged their first TSS proposals with the AER recently. The AER will release an Issues Paper in early December which will discuss key themes arising from the proposals.
- As part of SA Power Networks’ 2015/16 Pricing Proposal, we proposed to implement a Residential Solar tariff, reflecting the specific load profile of solar PV residential customers, as well as a Residential Social tariff to support the State’s most vulnerable electricity customers. These tariffs were rejected by the AER in June 2015 and are currently subject to Judicial Review in the Federal Court.

These are all important developments for our tariff reform program and accordingly we intend to continue our engagement with customers and other stakeholders as we work towards final approval of our TSS for the period 2017-20. In particular, we propose to:

- Review the impact on small business customers of the proposed actual kW demand tariff;
- Review all other customer impacts as a result of the changes in efficient costs that have been determined by the AER’s Final Decision;
- Review the findings (when determined) of the Judicial Review on Solar PV and Social Tariffs;
- Consult with stakeholders and customers on these matters in February 2016;

Review the Stand-alone and Avoidable costs of our tariff classes, and the long run marginal cost signals of our tariffs incorporating the AER’s Final Decision efficient costs; and

Consult with Retailers on opportunities for improving the efficiency with which new tariff initiatives (including transition) can be introduced in July 2017.

Our proposal in summary

This TSS and accompanying Overview Paper propose our Tariff Structures for the period 2017-20. Both documents are intended to explain how we have balanced the requirements of the Rules to pursue cost reflective prices with the feedback from our customers and other stakeholders on how and when we should introduce such changes. The two documents outline tariff reform through to 2025 so that readers are assisted in understanding how our proposed 2017-20 tariff changes fit into the bigger reform program.

We have talked to customers and other stakeholders about possible approaches. Based on these conversations, our approach to cost reflective pricing is to introduce a monthly charge based on a customer’s peak demand (which will be offset by cheaper energy costs). Customers and stakeholders have asked us to take a measured and methodical approach to tariff reform for the initial period out to 2020. Therefore we propose to make demand-based tariffs mandatory from July 2017 for all new customers and all customers who request a significant alteration to their metering arrangements. Alterations include physical supply changes (for example, converting from single-phase to 3-phase power); new inverter approval (if the Solar PV Tariff is permitted, this will only apply to approvals >2.5kW); and new major appliances >25 amps (such as a very large air conditioner or an Electric Vehicle fast-charger).

In the case of all other existing customers, we are proposing to continue with usage based tariffs with the exception of the largest small business (> 40 MWh pa) and residential customers (> 20 MWh pa) who will be reassigned to a demand based transition tariff if they have a suitable advanced interval meter. This will occur from July 2018, and continues our historic approach of reassigning our largest customers to cost reflective tariffs based on total annual consumption.

The demand based transition tariff has been simplified and only partially reflects the customer’s peak demand use (approximately 40% of the long run marginal cost). It is being offered in the period 2017 – 2020 in order to minimise the impact on those customers who might otherwise face higher prices under full cost reflective tariffs and to provide some initial stability in pricing.

For those who would be better off, the option to ‘opt in’ to a fully cost reflective demand-based tariff will be available.

In our view, such an approach will provide cost reflective information to customers at the critical time they are making important demand-side investment decisions for the future (large air conditioning units, solar PV or otherwise). It gives customers who have a low impact on the network or who are willing to change behaviour a tool to reduce costs, by opting in to the tariffs. By restricting mandatory reassignment to the largest of customers to a carefully designed transition tariff later in the regulatory period, we will be better able to manage customer impacts while still progressing towards cost reflective pricing for all customers by around 2025.
SA Power Networks

To summarise, this approach is proposed as a prudent balance of our obligation to pursue cost reflectivity with our desire to minimise any negative impacts on our customers.

It is important to note that the pending Federal Court decisions regarding our proposed Solar tariff and Social tariff may materially impact a number of aspects of this proposed TSS. Accordingly, a comprehensive review of our TSS proposal may be required at the time the Federal Court decisions are known.
## Shortened forms

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<tr>
<td>AER</td>
<td>Australian Energy Regulator.</td>
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<tr>
<td>Augmentation</td>
<td>Investment in new network assets to meet increased demand.</td>
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<tr>
<td>Capacity, capability</td>
<td>The amount of energy that a part of the network is able to carry.</td>
</tr>
<tr>
<td>Capital</td>
<td>Works for which the customer(s) contribute towards the cost of supplying assets, typically because they are the sole users.</td>
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<tr>
<td>Contributed Works</td>
<td></td>
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<tr>
<td>COAG</td>
<td>Council of Australian Governments.</td>
</tr>
<tr>
<td>Contestability</td>
<td>Customer choice of electricity supplier.</td>
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<tr>
<td>Controlled Load</td>
<td>The DNSP controls the hours in which the supply is made available.</td>
</tr>
<tr>
<td>Cost of Supply Model</td>
<td>Theoretical and algorithmic model used to calculate prices, which conform to the pricing goals.</td>
</tr>
<tr>
<td>Cross subsidy</td>
<td>Where the price to a tariff class falls outside the range between the avoidable incremental cost of supply and the cost of stand-alone supply, an economic cross subsidy from or to other customers is said to exist.</td>
</tr>
<tr>
<td>Decision</td>
<td>The Australian Energy Regulator’s Preliminary Decision on South Australia - distribution determination 2015–16 to 2019–20, April 2015</td>
</tr>
<tr>
<td>Demand</td>
<td>Energy consumption at a point in time.</td>
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<tr>
<td>Demand Management</td>
<td>Attempt to modify demand behaviour so as to constrain demand at critical times.</td>
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<tr>
<td>Distribution Network</td>
<td>The assets and service which links energy customers to the transmission network.</td>
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<tr>
<td>Distributor, DNSP</td>
<td>Distribution Network Service Provider.</td>
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<tr>
<td>DUoS</td>
<td>Distribution Use of System. The utilisation of the distribution network in the provision of electricity to consumers (a component of NUoS).</td>
</tr>
<tr>
<td>EDPD</td>
<td>Electricity Distribution Price Determination (South Australian).</td>
</tr>
<tr>
<td>ESCoSA</td>
<td>Essential Services Commission of South Australia, the South Australian Regulator of energy and other infrastructure.</td>
</tr>
<tr>
<td>FiT</td>
<td>Feed-in Tariff, paid to customers that have solar PV generators.</td>
</tr>
<tr>
<td>FRC</td>
<td>Full Retail Competition (sometimes called Full Retail Contestability).</td>
</tr>
<tr>
<td>High Voltage</td>
<td>Equipment or supplies at voltages of 22 or 11 kV.</td>
</tr>
<tr>
<td>IBT, Inclining Block Tariff</td>
<td>A network tariff energy rate in which the rate increases above specific consumption thresholds.</td>
</tr>
<tr>
<td>JSA</td>
<td>Jurisdictional Scheme Amount, a component of the Network Use of System charge to fund Feed-in Tariff payments to customers that have solar PV generators.</td>
</tr>
<tr>
<td>kVA, MVA</td>
<td>Kilo-volt amps and Mega-volt amps, units of instantaneous total electrical energy.</td>
</tr>
</tbody>
</table>
### Abbreviation | Definition or description
--- | ---
**kVA, MVar** | Kilo-volt amps (reactive) and Mega-volt amps (reactive) units of instantaneous reactive electrical power demand. Usually the peak demand is referenced. See also PF for the relationship between power demand quantities.
**kW, MW** | Kilo-watts and Mega-watts, units of instantaneous real electrical power demand. Usually the peak demand is referenced. See also PF for the relationship between power demand quantities.
**kWh, MWh** | Kilo-watt hours and Mega-watt hours, units of electrical energy consumption.
**Low Voltage** | Equipment or supply at a voltage of 230 V single phase or 415 V, three phase.
**Marginal Cost** | The cost of providing a small increment of service. The Long Run Marginal Cost (LRMC) includes future investment, Short Run Marginal Cost (SRMC) considers only the costs involved without extra investment.
**Market Participant** | Businesses involved in the electricity industry are referred to as Market or Code Participants.
**Supply Rate** | The fixed daily cost component of a Network price.
**NEL** | National Electricity Law.
**NEM** | National Electricity Market.
**NUoS** | Network Use of System. The utilisation of the total electricity network in the provision of electricity to consumers (NUoS = DUoS + TUoS).
**PV** | Photo-Voltaic
**PF** | Power Factor, a measure of the ratio of real power to total power of a load. The relationship between real, reactive and total power is as follows:

\[
\text{Power Factor} = \frac{\text{Real Power} (\text{kW})}{\text{Total Power} (\text{kVA})} \\
\text{Total Power} (\text{kVA}) = \sqrt{\text{Real Power} (\text{kW})^2 + \text{Reactive Power} (\text{kVAr})^2}
\]

**Price Signal** | Prices set to convey a desired behaviour because of the costs associated with supplying the service.
**Price Structure** | The components that make up a Price available to customers.
**Proposal** | SA Power Networks’ Initial Pricing Proposal, submitted in accordance with the Rules (this document).
**Retailer** | An FRC market participant (business) supplying electricity to customers.
**Rules** | National Electricity Rules.
**Subtransmission** | Equipment or supplies at voltage levels of 66 or 33 kV.
**Tariff** | A grouping of customers who are subject to the same network price.
## Abbreviation

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<td>Tariff class</td>
<td>A class of customers for one or more direct control services who are subject to a particular tariff or particular tariffs.</td>
</tr>
<tr>
<td>ToU</td>
<td>Time of Use, a system of pricing where energy or demand charges are higher in periods of peak utilisation of the network.</td>
</tr>
<tr>
<td>Transmission Network</td>
<td>The assets and service that enable generators to transmit their electrical energy to population centres. Operating voltage of equipment is 275 and 132 kV with some at 66 kV.</td>
</tr>
<tr>
<td>TUoS</td>
<td>Transmission Use of System charges for the utilisation of the transmission network.</td>
</tr>
<tr>
<td>Unmetered supply</td>
<td>A connection to the distribution system which is not equipped with a meter and has estimated consumption. Connections to public lights, phone boxes, traffic lights and the like are not normally metered.</td>
</tr>
<tr>
<td>WAPC</td>
<td>Weighted Average Price Cap, a form of regulatory price control, where the allowable price change is based on the weighted historic consumption of each price.</td>
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  Appendix E : Regulatory Compliance Checklist


SA Power Networks

1  Introduction

SA Power Networks is submitting this Tariff Structure Statement (TSS) for 2017/18 to 2019/20 to the Australian Energy Regulator (AER). The proposal has been prepared in accordance with the requirements of the National Electricity Rules (Rules) and the AER’s 2015-20 Final Determination made in October 2015.

This document covers all of SA Power Networks’ standard control services (DUoS) and alternative control services (metering). In its final determination, the AER confirmed a change in regulatory control mechanism for SA Power Networks for 2015-20, with a revenue cap replacing the previous weighted average price cap (WAPC) for standard control services and a price cap replacing the alternative control services’ WAPC.

1.1  National Electricity Rules

Clause 6.1.1 of the Rules confers responsibility on the AER for the economic regulation of distribution services provided by means of, or in connection with, distribution systems that form part of the national grid.

1.1.1  Classification of distribution services

In accordance with clause 6.2.1 and 6.2.2 of the Rules, the AER has classified SA Power Networks’ distribution services into the following three classes:

1. Direct control services;
2. Negotiated distribution services; and
3. Unregulated distribution services.

Direct control services have been further divided into the following two subclasses:

1. Standard control services; and
2. Alternative control services.

This TSS applies to all of the direct control services provided by SA Power Networks.

1.2  Scope of SA Power Networks’ Tariff Structure Statement

SA Power Networks’ TSS Proposal sets out the proposed approach to tariffs required to comply with the revenue cap (direct control) and price cap (alternative control) approved by the AER, in particular the new network pricing rule requirements of clause 6.18.1A (Tariff structure statement) and 6.18.5 (Pricing principles).

This Proposal is submitted in accordance with, and complies with, the requirements of:

1. The National Electricity Law;
2. The National Electricity Rules, including the Transitional Rules for South Australia;

1.3 Structure of this TSS

In Part I of the Rules, clause 6.18 (Distribution Pricing Rules) sets out the requirements concerning Distribution Pricing that SA Power Networks’ TSS must include. Key Rules are set out below:

6.18.1A Tariff structure statement

(a) A tariff structure statement of a Distribution Network Service Provider must include the following elements:

(1) the tariff classes into which retail customers for direct control services will be divided during the relevant regulatory control period;

(2) the policies and procedures the Distribution Network Service Provider will apply for assigning retail customers to tariffs or reassigning retail customers from one tariff to another (including any applicable restrictions);

(3) the structures for each proposed tariff;

(4) the charging parameters for each proposed tariff; and

(5) a description of the approach that the Distribution Network Service Provider will take in setting each tariff in each pricing proposal of the Distribution Network Service Provider during the relevant regulatory control period in accordance with clause 6.18.5.

(b) A tariff structure statement must comply with the pricing principles for direct control services.

(e) A tariff structure statement must be accompanied by an indicative pricing schedule which sets out, for each tariff for each regulatory year of the regulatory control period, the indicative price levels determined in accordance with the tariff structure statement.

Other relevant Clauses of the Rules that are addressed in formulating this TSS Proposal comprise:

6.18.3 Tariff classes

6.18.4 Principles governing assignment or re-assignment of retail customers to tariff classes and assessment and review of basis of charging

6.18.5 Pricing principles

6.18.6 Side constraints on tariffs for standard control services (this is more of an annual pricing proposal matter to control the changes in average prices between different tariff classes, but is included here for completeness)

6.18.7 Recovery of charges for transmission use of system services

6.18.7A Recovery of charges for jurisdictional scheme amounts

6.18.9 Publication of information about tariffs and tariff classes

Readers are directed to Appendix E for a detailed compliance matrix.
This TSS has been structured so as to allow compliance with the specific requirements of the Rules and the AER’s Decision to be readily ascertained. The substantive sections of this TSS Proposal are set out in Table 1 below.

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<td>Appendices</td>
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1.4 Confidential information

Clause 6.19.2 of the Rules classifies as confidential all network pricing information about a Distribution Network User used by a DNSP for the purposes of network pricing. SA Power Networks does not consider that this TSS contains any such confidential information.

SA Power Networks advises that the AER may disclose the information contained in this TSS to any person outside of the AER.
SA Power Networks

2 Our Context

This Section of the TSS provides contextual information on SA Power Networks’ business circumstances. This provides context both to SA Power Networks’ existing network tariffs and the rationale for the changes to tariffs that are proposed during the 2015-20 regulatory control period and beyond.

2.1 SA Power Networks’ business

SA Power Networks’ distribution network covers the State of South Australia, a vast territory of about 178,200 square kilometres (km), with a coastline of over 5,000 km. The network’s route length extends to more than 87,000 km, with approximately 19% of that length underground. The network includes 403 zone substations, 72,600 distribution transformers, approximately 723,000 poles and 1.1 million meters.

The extent of SA Power Networks’ operations in South Australia is shown in Figure 1.

![Figure 1 - SA Power Networks’ service area](image-url)
SA Power Networks

The South Australian distribution network is predominantly three-phase, with a single-phase system used mostly in rural and remote areas. A sub-transmission network supplies and links zone substations, operating at 66 kilovolts (kV) and 33 kV. In rural and remote areas the single-phase system operates at 19 kV. Overall, some 30% of the network is comprised of these long ‘single wire earth return’ (SWER) lines. In higher density rural and urban locations, the three-phase feeder system operates at 11 kV. The standard low voltage customer supply is 230V at 50Hz.

With the exception of much of the coastal area and the hinterland, South Australia is very sparsely settled. Approximately 70% of customers reside in Adelaide, including the great majority of business and commercial customers. However, the extensive area serviced by distribution means that 70% of the network infrastructure is required to deliver energy to the remaining 30% of customers. Compared with other states, there are relatively few regional centres, and they are generally small and located widely across the territory.

As a result, the average customer density across the State is very low. This discussed further in Section 2.5 below.

2.2 Climatic conditions

Adelaide and much of South Australia has a dry climate featuring greater extremes of summer temperature than most other Australian capitals. Extended periods of heatwave conditions can occur in summer (March 2008, January-February 2009, November 2009 and January 2014 are recent examples of extended heatwaves).

During these heatwave periods, summer daytime temperatures can exceed 40°C for several days in a row and overnight minimums can remain above 30°C for some of those days.

2.3 SA Power Networks’ customer and demand profile

The South Australian climate has led to lead to an extraordinary demand for air conditioning. Over 90% of homes are air conditioned with the air-conditioned floor space of these homes increasing each year. The consequent high peak network demand occurs for only a small part of the year. At other times in summer, milder weather often occurs which requires no air conditioning in most homes.

Extremely ‘peaky’ conditions such as these heatwaves require network assets and capacity that is under-utilised during much of the year, driving distribution costs higher on a per unit of energy served basis than comparable interstate networks.

A more recent development has been the customer uptake of PV systems by small customers. Over 25% of residential customers now have PV systems operating, reducing their use of energy when the sun is shining. The incentives of the solar PV feed-in tariff schemes have been popular, and customers have responded to the incentives provided.

Figure 2 and Figure 3 show the demand profile for SA Power Networks from the residential and business customers (it excludes the major business customers). Figure 2 shows the extreme outcome from the January 2014 heatwave and Figure 3 from the 2009 heatwave. The charts show
that gross demand has not changed significantly over the intervening years but the output of solar PV has made an impact. We have used the metered loads as the basis for our network pricing calculations and the sharing of network costs between customer segments (tariff classes). However, we also have regard to the change in daily peak profile that has occurred post-PV, with the co-incident system peak now occurring late afternoon and early evening. We still have business networks peaking at noon through mid-afternoon and residential networks peaking in the evening but the co-incident peak has shifted to later in the day after adjusting for PV export. We have incorporated these time issues into our cost reflective demand charging periods. We also note the impact that solar PV has in reducing load during sunny periods to levels lower than overnight minimums, leading to our ‘Solar Sponge’ initiatives where we wish to encourage additional load during the 10am–3pm period (11am to 4pm during daylight saving).

Figure 4 compares the extreme outcome during the January 2014 heatwave on a workday to a similarly extreme day a fortnight later on a Sunday in February. Because South Australia has such a high proportion of demand serving air-conditioning, peak demands on a Sunday can reach over 90% of the maximum demand reached on a workday. There are locations on the network such as coastal areas, the southern suburbs and the eastern suburbs (excluding the CBD) which can have demand as high on a Sunday as on a workday with similar weather. Consequently, we have adjusted the residential peak demand charging periods to include non work-days whereas business peak demand is measured solely on work-days.
Figure 3 - Customer Segment MW Demands on 29 January 2009

Figure 4 - Customer Segment MW Demands in 2014 Heatwave – 16 January workday versus 2 February Sunday
2.4 Coincident Demand

The South Australian distribution network has the highest ratio of peak to average demand across the NEM distribution businesses. The following chart is taken from data published by the AER and shows that on a state by state basis, SA has the most pronounced ‘peak demand’.

As discussed in our *Electricity Tariff Reform in South Australia Consultation Paper* released in October 2015, a change to more cost reflective pricing means that we need to incorporate a price based on ‘peak demand’. The analysis of customer loads that we presented in the Consultation Paper illustrated the diversity in ‘peak demand’ for customers with the same annual consumption. With such a difference between peak demand and average demand (the pricing basis for our current tariffs) it is inevitable that reforming tariffs to one involving peak demand will have a significant customer impact on the distribution of energy costs.

In the scatter chart below, the vertical axis shows the summer peak demand recorded for these customers - it is labelled as ‘cost to serve’ to reflect that peak demand is the underlying cost driver of the network. The horizontal axis shows the total annual consumption of these same households. Since our current prices are based on consumption and not demand, this axis reflects ‘revenue contributed’.

For example, customers consuming the median 4,000kWh per annum (and therefore paying the median network bill of $638 inc GST in 2015-16) have peak demands from around 2kW to around 6 kW.
With such a diverse range of peak demands it is inevitable that the impacts on customers will be similarly wide-ranging. Analysis for Business Customers using the actual kVA demand tariff revealed more variation in cost reflective impacts as the peak demand variation is more severe. We will be reviewing the effect of the proposed Business actual kW demand tariff (including the transition option) to see if the likely variations are not as severe, in particular the proportion of customers with large price increases and whether such increases are underpinned by sound Long Run Marginal Cost (LRMC) signals.

2.5 Customer Density

We supply electricity to around 850,000 customers ranging from isolated farms in rural areas to industry precincts, regional and metropolitan residential homes, businesses and city centres.

Around 70% of the network is required to serve the 30% of customers who live outside the Adelaide Metropolitan area.

As a result, the average customer density per kilometre of distribution line in SA is the lowest in the National Electricity Market. Put another way, we provide more network per customer than the other regions. The only distributors with lower customer densities are the largely rural networks operated by Ergon in Queensland and Essential in NSW. We are the only mainland state to have a single distribution business for the entire state.
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The following chart is taken from data provided the distribution businesses and published by the AER:

![Figure 7 - Customer density of Different State Distribution Systems](chart)

The South Australian government has imposed a requirement on SA Power Networks to maintain state-wide pricing for small customers (with annual consumption not exceeding 160 MWh). As a consequence, all of SA Power Networks’ distribution tariffs are averaged. Without this ‘country equalisation scheme’, cost reflective network charges would mean a doubling of network costs for many rural customers.

This long-standing policy commitment from government effectively precludes us incorporating locational price signals into our general tariffs and so pricing reform in SA can only practically be in relation to peak demand.

### 2.6 Metering

Since demand for electricity from our network varies across the year and across the day, if we are to change the way we price we will need to be able to measure more precisely when each customer uses electricity and how much at any particular point in time. An advanced interval meter is required to do this. Currently in SA less than 1% of customers have this type of meter, with most customers having a traditional meter that simply measures accumulated energy use. Unlike the

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5 South Australian Treasurer, Electricity Act 1996 Section 358 Electricity Pricing Order, 11 October 1999. Cl 7.3 (f)-(h)
6 For larger business customers with energy consumption in excess of 40 GWh or a demand greater than 10 MW, locational transmission use of system (TUoS) charges apply.
approach taken by the Government in Victoria for their smart meter roll-out, there will not be a compulsory roll-out of advanced interval meters to all customers in South Australia.

Nevertheless, these advanced interval meters will increasingly appear in SA under a new competitive framework for metering announced on 26 November 2015 by the AEMC. The new Rules aim to facilitate a market-led (retailer-led) approach to the deployment of advanced interval meters. The changes to the Rules also include provisions to ensure customers can have free access to their interval data.

From 1 December 2017, retailers will be responsible for arranging metering services for all small customers (< 160MWh), not SA Power Networks. All new and replacement meters must also be advanced interval meters that meet the ‘minimum services specification’ included in the new Rules.

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7 AEMC, Expanding competition in metering and related services, Rule Determination, 26 November 2015, Sydney
3 Our approach to network tariff reform

This Section contains the objectives that SA Power Networks applies to the development of its network tariffs. It goes on to outline the strategies SA Power Networks proposes to pursue in developing tariffs during the 2015-20 and 2020-2025 regulatory control periods.

3.1 Regulatory Requirements

The information in this Section concerning potential future network tariff developments is provided pursuant to clause 6.18.1A of the Rules.

6.18.1A Tariff structure statement

(a) A tariff structure statement of a Distribution Network Service Provider must include the following elements:

(5) a description of the approach that the Distribution Network Service Provider will take in setting each tariff in each pricing proposal of the Distribution Network Service Provider during the relevant regulatory control period in accordance with clause 6.18.5.

(b) A tariff structure statement must comply with the pricing principles for direct control services.

Clause 6.18.5, referenced above, sets out the Pricing Principles and the Network Pricing Objective.

3.2 Network tariff objectives

This Section presents the high level framework that SA Power Networks applies to the development of its network tariff strategy.

The Pricing Principles of Clause 6.18.5 can be seen as presenting two ‘sets’ of aims:

- Cost reflectivity
- Customer impact

Our TSS has been prepared in response to changes to the Rules that require us to pursue cost reflectivity in our prices. We are also required to do this in a way that recognises the impacts on our customers of changing the basis for our prices.

It is the need to balance these two (ie what degree of cost reflectivity results in acceptable customer impacts) that has formed the basis of our consultation with customers in developing this TSS.

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8 Including the revenue boundaries of (e), the basis in long-run marginal cost (LRMC) at (f) and revenue sufficiency at (g).
9 Including the customer impact and transition provisions of (h), the ability for customers to understand the tariffs at (i) and the compliance with other regulatory instruments at (j)
3.2.1 Cost Reflectivity

Our tariffs will, within the limitations of metering arrangements and efficient tariff structures, signal the costs associated with increased demand placed on the network, including the use of air conditioning.

Where metering arrangements don’t allow efficient pricing structures to be used (eg where Type 6 meters are used) then we will endeavour to ensure that a fair level of cost-recovery occurs with those customers. We will endeavour to ensure that one group of customers do not need to pay an unfair amount of network charges as a result of another group of customers avoiding a fair share by exploiting any Type 6 meter tariff structure deficiency.

Consistent with clause 6.18.5, SA Power Networks’ network tariffs aim to:

- Attain revenue sufficiency under the Revenue Cap;
- Signal the long run marginal cost of supply, clearly where possible through demand parameters;
- Improve cost reflectivity and reduce revenue variability by reducing the reliance on usage based tariff components where appropriate; and
- Pass on the cost of ElectraNet’s transmission services to customers and of the South Australia Government’s Solar PV Feed-in-Tariff Scheme as efficiently and as non-distortionary a way as possible.

3.2.2 Customer Impact Principles

Like many of our peers, we have sought to develop a set of Customer Impact Principles to help guide the numerous decisions involved in setting our tariffs. We listened to our stakeholders during our engagement program and in the Consultation Paper posed the following question:

“We plan to develop a set of ‘Customer Impact Principles’ that we can use to guide future decisions on tariff reform. These principles would build on the ‘pricing principles’ contained in the National Electricity Rules to provide guidance on how customer impacts should be considered in an objective, repeatable way. What should be included in these principles?”

We received a number of responses from our stakeholders and have compared these with those put forward by our peers in their respective TSS consultations. What we found is a diverse range of principles that can be grouped into a small number of categories.

In our summary view, and against a strong message of “Keep it simple!”, our customers want tariff reform to deliver tariffs that are:

- Fair and equitable
- Understandable, Actionable, Avoidable
- Predictable and Durable

Each of these sets of attributes is discussed further below:
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Fair and equitable
Stakeholders understand that tariff reform will undo some of the existing cross subsidies in electricity pricing. Being ‘fair and equitable’ refers to the need for tariff reform to be sensitive to the social and economic vulnerabilities of our customers as these cross subsidies are removed.

This includes the need for compatibility with the State’s approach to ‘postage stamp pricing’ for small electricity customers (i.e., the Country Equalisation Scheme whereby small rural customers cannot be charged more than small urban customers) and the South Australian Government’s energy concession scheme.

Understandable, Actionable, Avoidable
This refers to the very strong preference of consumers for simple tariffs that can be easily understood (i.e., Understandable), price signals that customers can respond to (i.e., Actionable) in a way that meaningfully reduces costs (i.e., Avoidable). The latter one emphasises the strong dislike customers have for fixed charges.

We are well aware of the challenges in communicating demand-based tariffs to our customers but we are also conscious of the findings of the CSIRO that, particularly in relation to the residential sector:

“Cost-reflective pricing will be more successful the less it relies on consumers, themselves, responding to changing price signals.”

It may well be that our price signals will not be commonly responded to by our customers themselves changing behaviour but by the smarter automation technology that is rapidly appearing in the market. This is an important consideration for our approach to opt-in tariffs.

Predictable and Durable
This refers to the strong preference for customers to both avoid ‘bill shock’ in the short term and, in the longer term, be able to invest in equipment such as air conditioning, solar PV, battery storage or other technology with an understanding of the sort of pricing they will experience over the life of the investment (which is likely to be a timeframe of 10 years or so).

This also captures the notions of “Robust for the Future” and “forward looking” that we discussed during consultations. Customers clearly want tariff reform to support and not hinder the technologies of the future – which at this stage looks like distributed generation and storage ‘behind the meter’ at customers’ premises.

The guidance from these three sets of attributes has been very helpful in forming our approach to transitioning customers to our cost reflective tariffs. However, they clearly have practical limitations. When making final decisions about tariff reform, our approach inevitably has to accommodate a trade-off of some principles and objectives over others.

10 CSIRO Stenner et al., p9
We also have to consider such matters as:

- Network price signals vs retail price structures.
- Price signals at time of investment vs signals for usage. The CSIRO refers to this as structural response prices vs behavioural response prices.
- New vs existing connections.
- Reflecting the relatively high costs of summer in SA vs avoiding bill shock.

Electricity Tariff reform in South Australia will continue for many years and we believe there is great value in further refining and evolving these Customer Impact Principles with our stakeholders in the lead up to the AER’s Draft Determination on our TSS in July 2016 and our response in September.

### 3.3 The ongoing need for tariff reform

As explained in Section 2.3, to a greater extent than any other Australian distributor, SA Power Networks’ summer demand is sensitive to the effect of air conditioning demand. High summer peak demands occur during heat wave conditions, which correspond with periods when the elements of the system have least capacity and the power factor of loads is poor. Air conditioning can account for 1200 MW of residential demand and 300 MW of business demand, and comprises nearly half of the State’s co-incident demand needs for electricity.

Over the last five years, the new development has been solar PV systems, especially within the residential networks. We now have over 25% penetration of these systems and there can be in excess of 500 MW of generation occurring near midday for over half of the year when the sun is shining. On mild days, up to 80% of this generation is exported to the network whilst on extreme days about a third is exported to the network. The customer uses the balance of PV generation.

The interaction between solar and air-conditioning changes the network challenges of today, with problems of low load during days with mild but sunny weather. In summer, the peaks that used to occur between 2pm and 5pm have moved to become slightly lower peaks between 5pm and 8pm. There are still business network peaks during the day but residential systems and co-incident systems are now peaking later.

The next development coming is battery storage, and with it electric vehicles. Battery storage has the potential to soak up a lot of the excess energy being generated during sunshine and shift that to later in the day when the network peaks. How this will change the impact of air conditioning on the network during extreme weather is unclear, but network tariffs that give good signals for economic peak-lopping will assist in the development of a more efficient and economic network.

If the take up of electric vehicles increases, we will again need clear signals to customers that enable them to recharge their car with convenience but without creating new peaks on the network. Technologies over the next five years will create quite strong pathways and opportunities for the future development of the network.

As a consequence, the management of summer demand has a high priority in SA Power Networks’ tariff reform strategies. This leads to an emphasis on providing network price signals that will encourage both residential and business customers to manage their contribution to peak demand by the following means:
The price levels of existing tariff structures;
- The development of more cost reflective tariff structures; and
- The development of innovative new tariff structures.

3.4 Tariff reform 2005 to 2015

Over the last two regulatory control periods (2005-10 and 2010-15), SA Power Networks undertook a number of tariff reforms, including the following:

- Large businesses have been encouraged to adopt kVA demand price structures where favourable, and have been mandatorily applied to customers using more than 250 kVA, and since July 2010 for new customers (and alterations to supply) requiring more than 70 kVA. Some medium-sized businesses have also opted in to the kVA demand prices;
- Power factor correction for businesses has been facilitated through the use of an excluded/negotiated service charge for excess reactive power requirements;
- Simplifying the small customer tariffs used by residential and business customers to reduce the number of steps. Prices in higher usage blocks have also been reduced relative to the first block, reflecting better understanding of actual costs of supply to these customers; and
- A residential actual demand tariff (optional) was established in 2014/15, although its adoption to date is limited. This remains a trial tariff program with up to 1,000 customers able to use the tariff. It has played an important role in indicating to customers and the electricity industry the sort of tariff structures and incentives around which new housing and new technology considerations should be made.

3.5 Cost reflective tariffs for large businesses completed July 2015

For large business, we are concluding a period of tariff reform that has operated over the last 15 years. We have nearly 5,500 large business customers (>160 MWh pa) on cost reflective demand tariffs. We have reassigned the last 1,000 of such customers to cost reflective tariffs in July 2015. To enable this to happen, we:

- Reviewed the individual circumstances of the 5,500 customers and determined their most appropriate tariff;
- Reviewed the demand history of those customers who would continue to utilise agreed demand tariffs to see if the agreed demand should be reduced;
- Created a new actual demand tariff for business which will be suitable for those businesses with seasonal load and/or load which is flexible during the afternoon/evening. The demand would typically be measured and billed monthly; and
- Created transition arrangements whereby customers who might otherwise face a price increase from these tariffs have a five year transition period where the tariff changes
progressively from 2014/15 arrangements to fully cost reflective arrangements by 2019/20. In 2015/16 the transition tariff is 30% cost reflective and applies to about 100 customers. All other customers were able to migrate to the cost reflective tariffs in July 2015 without price increases.

We expect to undertake similar reviews in the lead-up to the proposed July 2018 application to residential customers with usage above 20 MWh pa and to small business customers with usage above 40 MWh pa.

### 3.6 New Residential tariffs from 2015/16

SA Power Networks introduced an actual demand tariff option for residential in 2014/15. We only allowed for limited take-up during 2015/16 (up to 1,000 customers only until relevant systems and processes are bedded in). The large business tariff reform initiative will take much of that resource over the next 12 months. The residential actual demand tariff structure underpins our plans for this tariff class’ cost reflective tariffs going forward. A similar tariff structure is proposed for small business, aimed at providing less complex but effective pricing signals to large numbers of customers.

We introduced a solar sponge for hot water from July 2015. Customers with controlled load can elect to have their time clocks adjusted (as a negotiated service) which will enable overnight hot water/floor heating load with additional daytime usage between 10am and 3pm. The aim is to get more flexible load using the network at those times when Solar PV is at its maximum and residential networks potentially have negative load. We have been careful in selecting times for this initiative as we do not want to increase loads when SA wholesale pool prices are high. It appears that the 10am to 3pm window does not have high prices (probably due to the high PV output at these times) so a good fit with this objective is apparent. Different time options are proposed depending on whether the customer has electric storage heating, a heat pump or floor heating. We will look at extending this concept to increase the amount of load on residential networks during the day.

### 3.7 New tariff options

The new Rule changes provide for some innovation in tariffs, without the more detailed consultation and approval processes associated with a TSS. The Rules refer to these as sub-threshold tariffs.

#### 6.18.1C Sub-threshold tariffs

(a) No later than four months before the start of a regulatory year (other than the first regulatory year of a regulatory control period), a Distribution Network Service Provider may notify the AER, affected retailers and affected retail customers of a new proposed tariff (a relevant tariff) that is determined otherwise than in accordance with the Distribution Network Service Provider’s current tariff structure statement, if both of the following are satisfied:

1. the Distribution Network Service Provider’s forecast revenue from the relevant tariff during each regulatory year in which the tariff is to apply is no greater than 0.5 per
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...cent of the Distribution Network Service Provider's annual revenue requirement for that regulatory year (the individual threshold); and

(2) the Distribution Network Service Provider's forecast revenue from the relevant tariff, as well as from all other relevant tariffs, during each regulatory year in which those tariffs are to apply is no greater than one per cent of the Distribution Network Service Provider's annual revenue requirement for that regulatory year (the cumulative threshold).

As part of the lead-up to annual Pricing Proposals from 2017/18, we will consider the need for such tariffs for a variety of reasons, including other tariff trials and any locational-specific opt-in tariff options required by impending network constraints. We do not have any plans for such tariffs at this time.

In 2015/16 we proposed to the AER to implement a Residential PV Solar tariff, reflecting the specific load profile of solar PV customers, as well as a Residential Social tariff to support the State’s most vulnerable electricity customers. These tariffs were rejected by the AER and are currently subject to Judicial Review by the Federal Court. SA Power Networks will further consider its position on these tariffs pending the outcome of the Review which may be announced in late 2015, otherwise at some time in the first half of 2016.
4  From Revenue to Prices – understanding tariff structures

The changes to the rules require tariff structures to have two main functions:

- send a ‘price signal for efficient consumption’, and
- recover revenue in a way that as much as possible reflects the total efficient cost of supplying the customer in question without distorting the efficient price signal.

The basic structure of our tariffs is very similar to that of other electricity distributors in the National Electricity Market with three key tariff parameters:

- A fixed supply charge ($ per day, month or quarter);
- A peak demand charge to send a forward price signal ($ per kW or kVA per month); and
- A volume charge ($/kWh) to make up the residual contribution to costs not covered by the other two elements.

Our allocation of revenue requirements to tariff classes and then tariffs is illustrated below. It is a three-stage process, involving determining the allowed revenue, splitting that revenue across the five tariff classes (and their tariffs) and finally setting prices for each tariff parameter to recover from customers the revenue allocated to that tariff class (and their tariffs).
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Figure 8 - Allocation of Revenue to Tariff Classes/Tariffs and to Tariff Parameters

The following diagram incorporates numbers of customers, total energy consumption and coincident demand. It illustrates the degree to which each tariff class has received an allocation of revenue from the three different revenue sources ie Distribution, Transmission and PV Feed-in-Tariff (FiT) recovery.
As well as charging customers the cost of managing the distribution network, we are also responsible for charging customers for the transmission and Solar PV Feed in Tariff (PV FIT) costs. We do this by splitting these costs amongst the different customer segments (or tariff classes, as below):

**Figure 9 - Outcomes of Revenue to Tariff Classes/Tariffs Allocations 2017/18**

The following sections discuss the formation of the tariff classes, the detailed tariff structures, the resultant prices and how these tariffs comply with the pricing principles.
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5 Tariff Classes

This Section describes SA Power Networks’ standard control service tariff classes and related tariff structures. It sets out the way in which they have been constituted to comply with the requirements of the Rules and the AER’s Determination.

5.1 Regulatory requirements

5.1.1 Rule requirements

SA Power Networks’ TSS must contain the information on tariff classes, tariffs and charging parameters set out in clause 6.18.1A of the Rules.

6.18.1A Tariff structure statement

(a) A tariff structure statement of a Distribution Network Service Provider must include the following elements:

(1) the tariff classes into which retail customers for direct control services will be divided during the relevant regulatory control period;

(2) the policies and procedures the Distribution Network Service Provider will apply for assigning retail customers to tariffs or reassigning retail customers from one tariff to another (including any applicable restrictions);

(3) the structures for each proposed tariff;

(4) the charging parameters for each proposed tariff; and

(5) a description of the approach that the Distribution Network Service Provider will take in setting each tariff in each pricing proposal of the Distribution Network Service Provider during the relevant regulatory control period in accordance with clause 6.18.5.

SA Power Networks is required to comply with the following requirements of clause 6.18.3 of the Rules with respect to tariff classes.
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6.18.3 Tariff classes

(a) [Deleted].

(b) Each customer for direct control services must be a member of 1 or more tariff classes.

(c) Separate tariff classes must be constituted for retail customers to whom standard control services are supplied and retail customers to whom alternative control services are supplied (but a customer for both standard control services and alternative control services may be a member of 2 or more tariff classes).

(d) A tariff class must be constituted with regard to:
   
   (1) the need to group retail customers together on an economically efficient basis; and
   
   (2) the need to avoid unnecessary transaction costs.

5.1.2 Requirements of the AER’s Decision

Figure 10 summarises the AER’s decision on service classifications for SA Power Networks for the 2015–20 regulatory control period.

Figure 10 - AER final decision on 2015–20 service classifications for SA Power Networks
In Attachment 13 of the Determination, AER has classified the following distribution services provided by SA Power Networks as standard control services:\footnote{AER, SA Power Networks Determination, October 2015, Attachment 13, Appendix A.}

### A.1 Standard network services

a. All network services except:

i. network services provided at the request of a distribution network user:

   (i) with higher quality or reliability standards, or lower quality or reliability standards (where permissible), than are required by the rules or any other applicable regulatory instruments, or

   (ii) in excess of levels of service or plant ratings required to be provided by SA Power Networks' assets, or

ii. extension or augmentation of the distribution network associated with the provision of a new connection point or upgrading of the capability of a connection point to the extent that a distribution network user is required to make a financial contribution in accordance with the rules, or

iii. other network services that are classified as negotiated distribution services in sections A.6 to A.15 of this Appendix A.

### A.2 Standard connection services

a. All connection services except:

i. connection services provided at the request of a distribution network user:

   (i) with higher quality or reliability standards, or lower quality or reliability standards (where permissible), than are required by the rules or any other applicable regulatory instruments, or

   (ii) in excess of levels of service or plant ratings required to be provided by SA Power Networks assets, or

ii. the provision of a new connection point or upgrading of the capability of a connection point to the extent that a distribution network user is required to make a financial contribution in accordance with the rules, or

iii. other connection services that are classified as negotiated distribution services in sections A.6 to A.15 of this appendix A.

### B.3 Unmetered metering services

a. The provision of metering services in respect of meters meeting the requirements of a metering installation Type 7.
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The AER has established procedures for assigning or reassigning customers to tariff classes in Attachment 14 of its Determination. At the commencement of the regulatory control period, SA Power Networks’ retail customers will be taken to be “assigned” to the tariff class which SA Power Networks was charging that retail customer immediately prior to 1 July 2015.12

Attachment 14 Section D of the Decision contains procedures for the reassigning of customers to tariff classes, with which SA Power Networks must comply during the 2015-20 regulatory control period. These procedures are set out in Section 8 of this TSS.

5.2 Standard control service tariffs and tariff classes

SA Power Networks’ Network Use of System (NUoS) tariffs are an aggregation of distribution use of system tariffs, metering service tariffs and transmission cost recovery tariffs (PV FiT recovery tariffs are also recovered similar to transmission). These tariff components are illustrated in Figure 11.

![Components of SA Power Networks’ network tariffs](image)

**Figure 11 - Components of SA Power Networks’ network tariffs**

Retailers may pass through the components of SA Power Networks’ network tariffs to customers directly, or modify their structure by bundling with the retail component, which includes the cost of purchasing generated energy from the NEM and retail costs.

This Section outlines the tariff arrangements, which are designed to recover the cost of providing prescribed control services to customers. These services are segregated into tariff classes and

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12 AER, Determination, October 2015, Attachment 14, p. 21.
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tariffs, which cover all of direct control services that SA Power Networks provides, as required by clauses 6.18.3(a) and 6.18.3(b).

Section 9 of this TSS outlines the arrangements for SA Power Networks’ alternative control metering service tariffs, which in accordance with clause 6.18.3(c) of the Rules has been constituted as a separate tariff class with separate tariffs and charging parameters.

The transmission cost recovery in Section 7 describes how the transmission costs incurred by SA Power Networks are recovered from customers, again with separate charging parameters for the tariffs.

The process by which SA Power Networks recovers the SA Government Solar PV Feed-in Tariff (FiT) payments through the PV Jurisdictional Scheme Amount (JSA) is described in Section 7. This is applied as percentage uplift to the DUoS charge.

The grouping of customers into standard control service tariff classes and the tariffs therein has historically distinguished between customers on the basis of the following factors:

- The nature and extent of usage of different types of customer;
- For business customers, nature of connection to the network, including the capacity voltage of connection. For major business customers, their location can influence the transmission tariff;
- Whether the customer also receives a controlled load service; and
- The type of meter installed at the premises, with a distinction between Types 1-5 metering and Type 6 metering.

SA Power Networks’ network tariff classes and tariffs for 2017-20 are shown in Figure 12 below. The tariff classes have been constituted with regard to the provisions of clause 6.18.3(d) of the Rules concerning economic efficiency and transaction costs. As is apparent from the diagram, the suite of tariffs provides:

- A range of tariffs which are dependent upon a customer’s size, consumption characteristics and voltage of connection (these factors are generally related); and
- More LRMC cost-reflectivity in the demand tariff options, facilitated by the metering arrangements.
5.2.1 **Standard control services tariffs**

The tariffs in Figure 12 cover a diverse range of customer requirements.

Residential customer tariffs cover the range of:

- Inclining block tariffs for most residential customers which have a fixed daily charge (termed the Supply Rate) and an inclining block energy component, in common with the tariff structures of many utilities. In 2009/10, the inclining block energy charge was modified to include four block levels. In 2014/15 the tariff reverted to two blocks. A separate energy rate applies to the energy consumption within each block level;

- If the Federal Court Judicial Review allows, there will be separate inclining block tariffs for residential customers with Solar PV and without Solar PV as well as a Residential Social tariff. If the Federal Court does not allow this, there will be a single tariff for residential with Type 6 metering;

- During 2017-20, we plan to investigate whether there are other identifiable Type 6 meter customers with a materially different load profile that would warrant a different tariff;
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- We will introduce a further transition version of the inclining block tariff in July 2018 for use by those residential customers with annual usage > 20 MWh but who still utilise a Type 6 meter;

- A cost reflective opt-in residential actual kW demand tariff was introduced in 2014/15. A transition version of this actual demand tariff is proposed for 2017/18, with different demand and usage prices.

- A solar sponge version of the actual kW demand tariff but with a peak and off-peak usage element is also proposed, with the off-peak price to encourage usage during times of high solar PV output (10am to 3pm CST);

- A social version of the actual kW demand tariff is also proposed (Judicial Review permitting); and

- A partner tariff is available for those customers who use controlled load (hot water) as well as a residential tariff.

Low Voltage Business customer tariffs cover the range of:

- Inclining block energy tariffs for most small business customers. A transition version of this tariff is proposed for July 2018 for those single-rate businesses with annual usage > 40 MWh but who still utilise a Type 6 meter;

- Two rate energy tariffs (peak and off peak) for many small business customers. A transition version of this tariff is proposed for July 2018 for those single-rate businesses with annual usage > 40 MWh but who still utilise a Type 6 meter;

- A partner tariff is available for existing customers using controlled load (hot water) as well as a business usage tariff;

- kVA agreed demand tariffs suitable for some larger small customers. The stepped demand charge in conjunction with a supply charge reflects the cost of providing network capacity at the particular voltage level. Business customers can opt-in for this tariff;

- Since July 2015, an actual kVA demand tariff suitable for larger small customers, particularly those with either seasonal load varies across the year or flexible load. Business customers can also opt-in for this tariff. A transition version of this tariff is also available from July 2015 for some customers who were assigned to cost reflective prices at that time; and

- From July 2017, an actual kW transition tariff suitable for those customers with loads typical of the small business customers, having high diversity and low load factor. This tariff will transition from approximately 40% of the LRMC demand signal to a 100% cost reflective version during 2020-25. There will also be an opt-in 100% cost reflective version of this tariff available from July 2017.

Distribution Transformer and High Voltage Business tariff class tariffs both cover the range of:

- kVA agreed demand tariffs. The demand charge in conjunction with a supply charge is stepped according to the customer’s size, to reflect the cost of providing network capacity at the particular voltage level. There is a version only available to HV customers, and
version for LV customers. The LV version is also available for HV customers with lower agreed demands (typically below 400 kVA); and

- From July 2015, an actual kVA demand tariff suitable for large customers, for seasonal large customers whose load varies across the year and also those large customers with very flexible load. A transition version of this tariff is also available from July 2015 for some customers who were assigned to cost reflective prices at that time. This tariff is available to both HV and LV business customers.

Major Business customer tariffs cover the 20 customers connected at either sub-transmission (33 kV or 66 kV) or from a zone substation (typically at 11 kV). The tariffs used by these very large customers comprise:

- kVA agreed demand tariffs with individually calculated (locational) transmission prices for those customers with a demand in excess of 10 MW or 40 GWh. The demand charge is stepped according to the customer’s size, to reflect the cost of providing network capacity at the particular voltage level. There is a sub-transmission and a zone substation version of these tariffs;
- postage stamped transmission prices apply to customers below that size threshold.

5.2.2 Standard control services tariff classes

The five tariff classes that SA Power Networks has established are as follows:

- Major business (11 kV substation connection through to 66 kV);
- High Voltage business (typically at 11 kV);
- Distribution Transformer connected business (typically requiring 150 kVA or more)
- Low voltage business including unmetered supplies; and
- Residential.

Figure 12 has illustrated the grouping of its individual tariffs into tariff classes. We have included a fifth tariff class for distribution transformer business customers (previously combined with low voltage business). Otherwise, the tariff classes are as utilised previously.

The distribution transformer tariff class (DTF) was separated out because the customers have certain key characteristics that are different to low voltage business (LVB). This enables more efficient pricing outcomes to be determined because:

- DTF customers use less network assets as they are normally of a size that warrants connection from a transformer and not from LV mains, unlike LVB;
- DTF customers are generally large customers with load factors and diversity of demand similar to other large customers whereas LVB are generally small customers (<160 MWh) with poorer load factors but with greater diversity of demand.

A description of the structure of tariffs in each of the tariff classes and the tariff charging parameters follows. Note that, for completeness and simplicity, those components of charging parameters
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associated with standard control services, transmission recovery and PV FiT recovery have been shown in the following Section. Alternative control services are discussed in Section 9 and by definition are different tariff classes.

5.3 Low voltage residential tariff class

This tariff class includes the residential single rate and the partner tariff for those residential customers who also utilise controlled load tariffs (hot water). There is also a residential actual demand tariff.

5.3.1 Low voltage residential single rate tariff

The low voltage residential single rate tariff is currently available to eligible residential customers taking supply at less than 1 kV. These customers ordinarily use a Type 1-6 NEM compliant meter and metered energy consumption is charged in two blocks. The low voltage residential single rate tariff incorporates the charging parameters set out in Table 2.

<table>
<thead>
<tr>
<th>Charging Parameter</th>
<th>Units</th>
<th>Element of service</th>
</tr>
</thead>
<tbody>
<tr>
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<td></td>
<td>Direct control DUoS</td>
</tr>
<tr>
<td>Supply Rate</td>
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</tr>
<tr>
<td>Block 1 Usage Rate</td>
<td>$/kWh</td>
<td>X</td>
</tr>
<tr>
<td>Block 2 Usage Rate</td>
<td>$/kWh</td>
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</tr>
</tbody>
</table>

Table 2 - Low voltage residential tariff single rate charging parameters

Metering charges are discussed separately in this TSS.

In 2017/18, we propose that there will be three variations of the residential single rate tariff, each using the structure shown in Table 2 but with different price levels (Federal Court Judicial Review permitting):

- Residential;
- Residential with solar PV connected; and
- Residential Social tariff (the Social tariff has a zero supply rate and no Jurisdictional Scheme Amount pass-through).

If the Federal Court does not permit this, there will be a single Residential version of this tariff, which will be closed to new applicants from July 2017.
SA Power Networks

We may develop an additional version of this tariff during 2017-20 for other identifiable Type 6 meter customers who have a materially different load profile. The same tariff structure will be used but with different prices.

We will create a further version of this tariff, for those customers who have triggered cost reflective tariffs but still with a Type 6 meter (eg customers above 20 MWh pa from July 2018, or customers installing large appliances exceeding 25 amps). The tariff parameter prices of this transition tariff are likely to reflect that of the Residential with solar PV connected.

This tariff will become obsolete in July 2017 when it will be closed to new applicants. All new applicants from 1 July 2017 will be assigned to the Residential monthly actual kW demand transition tariff.

5.3.2 Controlled load – partner tariff

The low voltage controlled load tariff is available for permanently installed storage water heaters with a rated delivery of not less than 125 litres, storage space heaters and other approved applications. A time switch for the control of the heater and separate metering is installed. The controlled load tariff incorporates the charging parameters set out in Table 3.

<table>
<thead>
<tr>
<th>Charging Parameter</th>
<th>Units</th>
<th>Element of service</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Direct control DUoS</td>
</tr>
<tr>
<td>Usage Rate</td>
<td>$/kWh</td>
<td>X</td>
</tr>
</tbody>
</table>

Table 3 - Controlled load tariff charging parameters

This tariff is available to residential customers. It is also available to those business customers that were taking supply under the controlled load tariff previously. This tariff is invoiced at the same frequency as the primary tariff.

Retailers may use this tariff with their own control devices if SA Power Networks’ control requirements are met. The window of 2300h-0700h and 1000h-1500h Central Standard Time is provided for controlled load operation. Operation anywhere within this window is permitted based on the customer’s requirements but with a randomised start time. We use a minimum randomisation time of 45 minutes for new installations ie from the programmed start time the load will switch in on a random basis within the first 45 minutes, for example:

- Start time 2300h – controlled load will switch in randomly between 2300h and 2345h,
- Start time 0130h – controlled load will switch in randomly between 0130h and 0215h.

The inclusion of 1000h-1500h is part of a ‘solar sponge’ initiative to increase load during the times of lowest load on the residential networks.
5.3.3  **Low voltage residential monthly actual kW demand tariff**

The low voltage residential monthly actual demand tariff is available to eligible residential customers taking supply at less than 1 kV. This is an optional tariff that commenced on 1 July 2014. These customers will require a Type 1-5 NEM compliant meter read at least monthly. Metered energy consumption is charged at a single rate. The maximum kW demand (measured over a half hour interval) between 4pm and 9pm on any day in the month is used to bill the monthly actual demand. A higher price applies for the five summer months (November to March) than the seven winter months (April to October). Currently, there is no charge for demand that is higher outside of the peak 4pm to 9pm time period. The demand charge is applied on a ‘per day’ basis according to the days in the month.

The low voltage residential monthly demand tariff incorporates the charging parameters set out in Table 4. The tariff had a minimum peak/shoulder period demand quantity of 1.5 W. In response to feedback from customers and other stakeholders, this will be reduced to 1.0 kW in 2017-20.

A separate version of this tariff is also proposed for those customers participating in the Social tariff program (if allowed by Judicial Review) and using a cost reflective demand tariff.
### Charging Parameter | Units | Element of service |
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Direct control DUoS</td>
</tr>
<tr>
<td><strong>Supply rate</strong></td>
<td>$/day</td>
<td>-</td>
</tr>
<tr>
<td><strong>Usage Rate</strong></td>
<td>$/kWh</td>
<td>X</td>
</tr>
<tr>
<td><strong>Peak Rate Summer Demand</strong></td>
<td>$/kW/day</td>
<td>X</td>
</tr>
<tr>
<td><strong>Shoulder Rate Winter Demand</strong></td>
<td>$/kW/day</td>
<td>X</td>
</tr>
<tr>
<td><strong>Off-peak Rate Demand</strong></td>
<td>$/kW/day</td>
<td>-</td>
</tr>
</tbody>
</table>

Table 4 – Low voltage residential monthly actual kW demand tariff charging parameters

#### 5.3.4 Low voltage residential monthly actual kW demand solar sponge tariff

This tariff will have exactly the same structure as a residential monthly actual kW demand tariff except that the usage component is split between peak and off-peak usage.

The time period for off-peak usage matches the time of high solar PV output, i.e. 10:00-15:00 CST (note, standard time, not local time) as this is the time of very low load on the residential network. Note that the time period is set as Central Standard Time, as the signal reflects the position of the sun and resultant PV output, not customer behaviour. It has not been set in local time.
### Charging Parameter | Units | Element of service
---|---|---
Supply rate | $/day | Direct control DUoS, Transmission recovery TUoS, Jurisdictional Scheme Amount Pass Through, Alternative control Metering
Peak Usage Rate | $/kWh | X, X, X
Off-peak Usage Rate | $/kWh | Consumption from 10:00 to 15:00 CST
Peak Rate Summer Demand | $/kW/day | X, X, X
Shoulder Rate Winter Demand | $/kW/day | X, X, X
Off-peak Rate Demand | $/kW/day | -

*Table 5 – Low voltage residential monthly actual kW demand solar sponge tariff charging parameters*

#### 5.3.5 Low voltage residential monthly actual kW demand transition tariff

A transition version of the monthly actual demand tariff will be introduced in July 2017 for use by residential customers mandatorily assigned to cost reflective tariffs. The tariff has the same structure as above, but with higher usage rates and lower demand rates. For the period 2017-20, the peak summer and shoulder winter rates will be equal. Customers assigned to this tariff can elect to opt-in to the fully cost reflective residential monthly actual kW demand tariff.

The transition tariff will be used from July 2017 for all new customers and significant alteration to supply customers (including new inverter approvals and installation of major appliances of 25 amps or more). Note that if the Federal Court Judicial Review allows the Solar tariff, customers with post-July 2017 inverter approvals below 2.5kW will not be mandatorily assigned to this tariff, but to the solar tariff.
SA Power Networks

The transition tariff will also be used from July 2018 by all residential customers with annual usage exceeding 20 MWh that have Type 1-5 interval meters installed (other Type 6 meter customers with annual usage above 20 MWh will be assigned to a transition residential cost reflective usage-based tariff).

Residential customers can elect to opt-in to the fully cost reflective residential monthly actual demand tariff from the transition tariff.

5.4 Low voltage business tariff class

The low voltage business tariffs cover a broad range of customer sizes and types of metering installations. This tariff class is the most diverse in terms of its consumption range and the variety of end uses. There is significant diversity in demand between these customers.

5.4.1 Business single rate tariff (obsolete)

The business single rate tariff is an obsolete tariff that was available for use at a Type 1-6 meter installation. As with the residential tariff, consumption is charged on an inclining scale in two consumption blocks. The business single rate tariff incorporates the charging parameters set out in Table 6. This tariff was closed to new applicants on 30 June 2010.

<table>
<thead>
<tr>
<th>Charging Parameter</th>
<th>Units</th>
<th>Element of service</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Direct control DUoS</td>
</tr>
<tr>
<td>Supply Rate</td>
<td>$/day</td>
<td>X</td>
</tr>
<tr>
<td>Block 1 Usage Rate</td>
<td>$/kWh</td>
<td>X</td>
</tr>
<tr>
<td>Block 2 Usage Rate</td>
<td>$/kWh</td>
<td>X</td>
</tr>
</tbody>
</table>

Table 6 - Business single rate tariff charging parameters

Metering charges are discussed separately in this TSS.

We will create a transition version of this tariff in July 2018 for small businesses with energy > 40 MWh pa but with a Type 6 meter.

We have used a transition version of this tariff in 2015/16 for large businesses still using a Type 6 meter.
5.4.2 Business 2-rate tariff

The business 2-rate tariff has a traditional Time of Use (ToU) structure with peak and off-peak consumption charges, using a Type 1-6 meter and incorporates the charging parameters set out Table 7. Originally, the peak pricing used inclining blocks but this was simplified in 2014/15.

Peak usage is defined as work days 0700-2100h Central Standard Time with all other times including non-work-days defined as off-peak. Note that where the Type 6 meter used does not distinguish between work days and public holidays or weekends, then the peak usage includes some otherwise non-work day usage.

<table>
<thead>
<tr>
<th>Charging Parameter</th>
<th>Units</th>
<th>Element of service</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Direct control DUoS</td>
</tr>
<tr>
<td>Supply Rate</td>
<td>$/day</td>
<td>X</td>
</tr>
<tr>
<td>Peak Usage Rate</td>
<td>$/kWh</td>
<td>X</td>
</tr>
<tr>
<td>Off Peak Usage Rate</td>
<td>$/kWh</td>
<td>X</td>
</tr>
</tbody>
</table>

Table 7 - Business 2-rate tariff charging parameters

Metering charges are discussed separately in this TSS.

This tariff will become obsolete in July 2017 when it will be closed to new applicants. All new applicants from 1 July 2017 will be assigned to the Business monthly actual kW demand transition tariff.

We will create a transition version of this tariff in July 2018 for small businesses with energy > 40 MWh pa but with a Type 6 meter.

We have used a transition version of this tariff in 2015/16 for large businesses still using a Type 6 meter.

5.4.3 Business low voltage agreed kVA demand tariff

The low voltage agreed kVA demand tariff generally applies to large business customers taking supply directly from a distribution transformer but can also be selected by a customer taking supply from the LV mains. This tariff requires a Type 1-5 interval meter capable of measuring both active and reactive power. The minimum demand of 70 kVA that previously applied has been removed from July 2015, although the tariff now includes a significant supply charge.
SA Power Networks

Since July 2015, the peak demand is measured on work days between 12 noon and 9pm local time during the summer months of November to March. Previously the peak demand was measured on workdays from December to March between 12 noon and 8pm local time. The expansion to 9pm and inclusion of November has been required because of significant co-incident network and business network demands at these times when extreme weather occurs.

Additional demand applies where higher levels of demand are required during the year than are required during the peak demand period.

Customers (through their retailer) can apply for agreed demand to be amended. Reduction requests require supporting evidence.

An alternate version of this tariff is available for sporting clubs with significant floodlighting. The alternate tariff is similar, except that the peak demand period has been amended to 12noon-7pm December to February, Monday-Friday rather than 12 noon-9pm November to March, Monday-Friday. The floodlights are not likely to be used on summer evenings when extreme temperatures occur due to health concerns, so peak charging for these lights is inappropriate.

There are two demand blocks, with the second block (above 1,000 kVA) utilised by only a few large businesses (all of these customers will be in the distribution transformer business class, see below). The tariff uses a simple anytime usage based charge. The primary pricing signal comes from the agreed demand charges.

The low voltage agreed kVA demand tariff incorporates the charging parameters set out in Table 8 below.
5.4.4 Business actual kVA demand tariff

The business actual kVA demand tariff is available to eligible business customers taking supply at less than 1 kV. This is a tariff that commenced on 1 July 2015. It is part of a suite of cost reflective tariffs that are required to be used by large business customers. It is also an optional tariff suitable for some small businesses. These customers will require a Type 1-5 interval meter read at least monthly. Metered energy consumption is charged at a single rate. Shoulder demand applies to the monthly workday maximum kVA demand (measured over a half hour interval) between 12 noon and 4pm local SA time every month of the year. An additional peak demand price applies for the five summer months (November to March) between 4pm and 9pm on workdays. System co-incident peaks occur on extreme days at these times. Currently, there is no charge for off-peak demand that is higher but outside of the peak and shoulder time periods. There is no supply charge.
### Pricing Structure

<table>
<thead>
<tr>
<th>Charging Parameter</th>
<th>Units</th>
<th>Direct control DUoS</th>
<th>Transmission recovery TJoS</th>
<th>Jurisdictional Scheme Amount Pass Through</th>
<th>Alternative control Metering</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Supply rate</td>
<td>$/day</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>X</td>
<td>Type 4 or 5 monthly meter required Fixed daily charge</td>
</tr>
<tr>
<td>Peak rate Summer Demand</td>
<td>$/kVA/day</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td></td>
<td>For Nov-March monthly demand, 16:00-21:00 local time</td>
</tr>
<tr>
<td>Shoulder rate Year-round Demand</td>
<td>$/kVA/day</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td></td>
<td>For July-June monthly demand, 12:00-16:00 local time</td>
</tr>
<tr>
<td>Off-peak Rate demand</td>
<td>$/kVA/day</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td></td>
<td>For demand each month outside Peak and Shoulder.</td>
</tr>
<tr>
<td>Usage Rate</td>
<td>$/kWh</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td></td>
<td>For all consumption</td>
</tr>
</tbody>
</table>

#### Table 9 – Business actual kVA demand tariff charging parameters

Metering charges are discussed separately in this TSS.

### Section 5.4.5  Business monthly actual kVA demand transition tariff

The business monthly actual kVA demand transition tariff is available only to business customers reassigned from a business energy tariff to a cost reflective tariff in July 2015 but who would be initially worse off as a result. This is a tariff that commences on 1 July 2015. It is part of a suite of cost reflective tariffs that are required to be used by large business customers. The tariff is a combination of 70% business 2-rate and 30% business actual demand. In 2016/17, the proportion of business 2-rate will reduce and the actual demand proportion will increase. Transition should be complete by 2020. These customers require a Type 1-5 interval meter read at least monthly.

All tariff elements used in the business 2-rate and agreed monthly demand tariffs are used in this transition tariff (see Table 10 below). The business monthly actual kVA demand transition tariff incorporates the charging parameters set out in Table 9 but with usage charged at peak and off-peak rates, with a supply charge applied (as per the business 2-rate definitions in Table 7).
### Charging Parameter

<table>
<thead>
<tr>
<th>Charging Parameter</th>
<th>Units</th>
<th>Element of service</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Direct control DUoS</td>
</tr>
<tr>
<td>Supply rate</td>
<td>$/day</td>
<td>-</td>
</tr>
<tr>
<td>Peak Rate Summer Demand</td>
<td>$/kVA/day</td>
<td>X</td>
</tr>
<tr>
<td>Shoulder Rate All Year-Demand</td>
<td>$/kVA/day</td>
<td>X</td>
</tr>
<tr>
<td>Off-peak Rate Demand</td>
<td>$/kVA/day</td>
<td>-</td>
</tr>
<tr>
<td>Peak Usage Rate</td>
<td>$/kWh</td>
<td>X</td>
</tr>
<tr>
<td>Off-Peak Usage Rate</td>
<td>$/kWh</td>
<td>X</td>
</tr>
</tbody>
</table>

Table 10 – Low voltage business actual kVA demand transition tariff charging parameters

Metering charges are discussed separately in this TSS.

#### 5.4.6 Business monthly actual kW demand transition tariff

The business monthly actual kW demand transition tariff will be available only to LV business customers assigned to a cost reflective tariff from July 2017 as a result of a trigger or threshold event (eg new customer, alteration to supply or customer using 40MWh pa or more). The tariff combines elements of business 2-rate and a monthly actual kW demand. This is a cost reflective tariff but initially with the demand signal set simply at approximately 40% of LRMC. These customers require a Type 1-5 interval meter read at least monthly.

There is also a 100% LRMC demand signal tariff at this time that customers may opt-in to.
For simplicity, the initial demand signal has been set at this lower level, at a rate that does not vary seasonally and over a fixed time period. The monthly demand is measured each month as the maximum half-hour interval recorded between 12 noon and 9pm local SA time on work days. This definition will remain through to June 2020 for this transition tariff.

Customers assigned to this tariff can opt-in to the business low voltage agreed kVA demand tariff, the business monthly actual kVA demand tariff or the business monthly actual kW demand tariff. All tariff elements used in the business 2-rate and agreed monthly demand tariffs are used in this transition tariff (see Table 11 below). However, the peak demand price is set to zero, and the shoulder demand time period is expanded to include 1200-2100h local SA time.

<table>
<thead>
<tr>
<th>Charging Parameter</th>
<th>Units</th>
<th>Element of service</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Supply rate</td>
<td>$/day</td>
<td></td>
<td>Fixed daily charge</td>
</tr>
<tr>
<td>Peak Rate Summer Demand</td>
<td>$/kW/day</td>
<td>-</td>
<td>For Nov-March monthly demand, 16:00-21:00 local time</td>
</tr>
<tr>
<td>Shoulder Rate All Year-Demand</td>
<td>$/kW/day</td>
<td>X</td>
<td>For July-June monthly demand, 12:00-21:00 local time</td>
</tr>
<tr>
<td>Off-peak Rate Demand</td>
<td>$/kVA/day</td>
<td>-</td>
<td>For demand each month outside Peak and Shoulder.</td>
</tr>
<tr>
<td>Peak Usage Rate</td>
<td>$/kWh</td>
<td>X</td>
<td>For all peak period consumption</td>
</tr>
<tr>
<td>Off-Peak Usage Rate</td>
<td>$/kWh</td>
<td>X</td>
<td>For all off-peak period consumption</td>
</tr>
</tbody>
</table>

Table 11 – Low voltage business monthly actual kW demand transition tariff charging parameters
SA Power Networks

Metering charges are discussed separately in this TSS.

There will also be a cost-reflective version of this business monthly actual kW demand tariff available as an opt-in tariff.

5.4.7 Unmetered supply tariffs

Unmetered supply tariffs are applicable to supply points that are not metered. Energy consumption is calculated using the appropriate algorithm in the applicable Metrology Procedure. Unmetered tariffs comprise of an energy rate that is applied to the calculated electricity consumption. There are two unmetered supply tariffs that are assigned by SA Power Networks, depending upon the customer’s consumption profile:

- Unmetered Overnight Usage supply is for overnight use for public lighting.
- Unmetered 24 hour usage supply is for constant 24 hour per day use, typically public phones, traffic lights and telecommunications installations.

Unmetered supply tariffs are generally invoiced monthly.

The low voltage unmetered usage tariffs incorporate the charging parameters set out in Table 12.

<table>
<thead>
<tr>
<th>Charging Parameter</th>
<th>Units</th>
<th>Element of service</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Direct control DUoS</td>
</tr>
<tr>
<td>Anytime Usage Rate</td>
<td>$/kWh</td>
<td>X</td>
</tr>
</tbody>
</table>

Table 12 - Unmetered overnight and 24 hour usage tariff charging parameters

5.5 Distribution Transformer Business tariff class

The proposed distribution transformer business tariff class covers a broad range of customer sizes and types of metering installations. All of these customers have required capacity of 150 kVA and above and generally are supplied from a distribution transformer. Most of the customers in this proposed tariff class are large customers (using 160 MWh or more each year) and these customers typically exhibit better load factors than the low voltage business tariff class, albeit with less diversity amongst each the cohort.

All customers in this tariff class should be on cost reflective tariffs (or a transition version) in July 2017.

There are three tariffs that are utilised by this proposed tariff class, and all three have been defined above in the low voltage business tariff class. They are:
SA Power Networks

- low voltage agreed kVA demand tariff (see Table 8);
- monthly actual kVA demand tariff (see Table 9);
- monthly actual kVA demand transition tariff (see Table 10); and
- business monthly actual kW demand tariff (see Table 11).

5.6 High Voltage Business tariff class

There are over 200 customers that take supply at high voltage. They are predominantly manufacturing, utility, agricultural and commercial installations.

There are three tariffs that are utilised by this tariff class, two have been defined above in the low voltage business tariff class. They are:

- Business low voltage agreed kVA demand tariff (see Table 8), referred to in this tariff class as the Business High Voltage agreed kVA demand (<400 kVA) tariff; and
- Business monthly actual kVA demand tariff (see Table 9).

The third HV tariff class tariff is set out below as a variant of the agreed kVA demand tariff.

The two agreed demand variants of this tariff are the most commonly used with the choice depending upon whether the customer’s maximum demand is in excess of about 400 kVA. Lower demands of up to 400 kVA use the equivalent of the Business LV agreed demand tariff whilst larger HV customers are more suited to this HV variation. HV customers can also elect to use the monthly actual kVA demand tariff. The boundaries between these three tariffs are approximate, with the customer able to elect any of the three tariffs through a request via their retailer.

5.6.1 High Voltage agreed kVA demand tariff

The agreed kVA demand tariff for business customers connected at high voltage is similar in structure to the low voltage equivalent described in Section 5.4.3, except that blocks of demand are not used in the HV.

The HV agreed kVA demand tariff previously contained three blocks of demand, plus peak and off-peak usage. The tariff was simplified in July 2015 to a single block of peak demand, a single usage price for energy and a significant supply charge. The tariff minimum of 1,000 kVA was removed.

Demand is measured on workdays between 12 noon and 9pm local time from November through March, as this is the time when co-incident demand affects the network during extreme weather.

This tariff’s charging parameters are set out in Table 13.
### Charging Parameter Table 13 - High voltage agreed kVA demand tariff charging parameters 400 kVA and above

<table>
<thead>
<tr>
<th>Charging Parameter</th>
<th>Units</th>
<th>Element of service</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Direct control DUoS</td>
</tr>
<tr>
<td>Supply Rate</td>
<td>$/day</td>
<td>X</td>
</tr>
<tr>
<td>Annual Peak Demand Rate</td>
<td>$/kVA/day</td>
<td>X</td>
</tr>
<tr>
<td>Additional demand</td>
<td>$/kVA/day</td>
<td>X</td>
</tr>
<tr>
<td>Usage Rate</td>
<td>$/kWh</td>
<td>X</td>
</tr>
</tbody>
</table>

#### 5.7 Major Business tariff class

The major business customers are the largest 20 customers connected to SA Power Networks’ network. They comprise a range of industrial, manufacturing and commercial enterprises. Customers connected at 33kV or 66kV utilise the sub-transmission agreed kVA demand tariff while customers connected to a zone substation (generally at 11kV) use the zone substation agreed kVA demand tariff. Most of these customers have demand exceeding 10 MVA or usage exceeding 40 GWh and so their transmission is priced locationally. Once a customer has received locational transmission pricing, we continue to apply such prices unless we receive a customer request via their retailer to have postage stamp transmission pricing which would require their demand to have fallen below 10 MVA and their annual usage fallen to below 40 GWh pa.

#### 5.7.1 Zone substation kVA demand tariff (postage stamp TUoS)

This kVA demand tariff is for business customers that take supply directly from a zone substation but do not utilise locational transmission pricing (ie their demand is < 10 MW and their annual usage is below 40 GWh). The tariff has a minimum agreed anytime demand of 5,000 kVA. The minimum annual usage requirement of 25 GWh was removed in July 2015. A Type 1-4 interval meter is required with the ability to measure both active and reactive power. The charging parameters for this tariff are set out in Table 14.
### Charging Parameter

<table>
<thead>
<tr>
<th>Charging Parameter</th>
<th>Units</th>
<th>Direct control DUoS</th>
<th>Transmission recovery TUoS</th>
<th>Jurisdictional Scheme Amount Pass Through</th>
<th>Alternative control Metering</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Supply Rate</td>
<td>$/day</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>If applicable</td>
<td>Fixed daily charge</td>
</tr>
<tr>
<td>Annual Demand Rate</td>
<td>$/kVA/day</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>-</td>
<td>For peak demand</td>
</tr>
<tr>
<td>Additional demand</td>
<td>$/kVA/day</td>
<td>X</td>
<td>-</td>
<td>X</td>
<td>-</td>
<td>Demand in excess of that required during summer peak hours.</td>
</tr>
<tr>
<td>Usage Rate</td>
<td>$/kWh</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>-</td>
<td>For all energy consumption</td>
</tr>
</tbody>
</table>

Table 14 - Zone substation kVA demand tariff charging parameters

Metering charges are discussed separately in this TSS.

### 5.7.2 Zone substation kVA demand locational tariff

This kVA demand tariff is similar in structure to the high voltage zone substation kVA demand tariff described in Section 5.7.1. It typically applies to those customers having agreed demand in excess of 10 MVA or annual consumption greater than 40 GWh. A Type 1-4 interval meter is required with the ability to measure both active and reactive power.

The tariff has averaged distribution charges, but a locational TUoS component is applied.

The TUoS component typically comprises a locational supply charge (for exit charges) and a locational peak demand charge. Some customers with a low load factor may have a lower demand charge but also have a usage charge. The charges are determined by passing through the ElectraNet transmission pricing for that customer’s location for that customer’s agreed demand and usage.

The charging parameters of this tariff are shown in Table 15.
### 5.7.3 Subtransmission kVA demand tariff (postage stamp TUoS)

This kVA demand tariff is for business customers that take supply directly from subtransmission at 66 kV or 33 kV but do not utilise locational transmission pricing (i.e., their demand is < 10 MW and their annual usage is below 40 GWh).

The tariff has a minimum agreed anytime demand of 5,000 kVA. The minimum annual usage requirement of 25 GWh was removed in July 2015. A Type 1-4 interval meter is required with the ability to measure both active and reactive power.

The charging parameters for this tariff are set out in Table 16.

<table>
<thead>
<tr>
<th>Charging Parameter</th>
<th>Units</th>
<th>Direct control DUoS</th>
<th>Transmission recovery TUoS</th>
<th>Jurisdictional Scheme Amount Pass Through</th>
<th>Alternative control Metering</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Supply Rate</td>
<td>$/day</td>
<td>-</td>
<td>Locational</td>
<td>If applicable</td>
<td></td>
<td>Fixed daily charge</td>
</tr>
<tr>
<td>Annual Demand Rate</td>
<td>$/kVA/day</td>
<td>X</td>
<td>Locational</td>
<td>X</td>
<td>-</td>
<td>For peak demand</td>
</tr>
<tr>
<td>Additional demand</td>
<td>$/kVA/day</td>
<td>X</td>
<td>-</td>
<td>X</td>
<td>-</td>
<td>Demand in excess of that required during summer peak hours.</td>
</tr>
<tr>
<td>Usage Rate</td>
<td>$/kWh</td>
<td>X</td>
<td>if applicable</td>
<td>X</td>
<td>-</td>
<td>For all energy consumption</td>
</tr>
</tbody>
</table>

Table 15 - Zone substation kVA demand locational tariff charging parameters

Metering charges are discussed separately in this TSS.
SA Power Networks

<table>
<thead>
<tr>
<th>Charging Parameter</th>
<th>Units</th>
<th>Element of service</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Direct control DUoS</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Transmission recovery TUoS</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Jurisdictional Scheme Amount Pass Through</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Alternative control Metering</td>
<td></td>
</tr>
<tr>
<td>Supply Rate</td>
<td>$/day</td>
<td>-</td>
<td>If applicable Fixed daily charge</td>
</tr>
<tr>
<td>Annual Demand Rate</td>
<td>$/kVA/day</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Additional demand</td>
<td>$/kVA/day</td>
<td>X</td>
<td>-</td>
</tr>
<tr>
<td>Usage Rate</td>
<td>$/kWh</td>
<td>X</td>
<td>X</td>
</tr>
</tbody>
</table>

Table 16 – Sub transmission kVA demand tariff charging parameters

Metering charges are discussed separately in this TSS.

5.7.4 Subtransmission kVA demand locational tariff

Subtransmission customers are connected to SA Power Networks’ network at 66 or 33 kV and have a minimum anytime agreed demand of 5 MVA. Previously, the minimum was 10 MVA. The tariff for these customers is similar in structure to the zone substation kVA demand locational tariff.

The TUoS component typically comprises a locational supply charge (for exit charges) and a locational peak demand charge. Some customers with a low load factor may have a lower demand charge but also have a usage charge. The charges are determined by passing through the ElectraNet transmission pricing for that customer’s location for that customer’s agreed demand and usage.

The charging parameters for the tariff are set out in Table 17.
<table>
<thead>
<tr>
<th>Charging Parameter</th>
<th>Units</th>
<th>Element of service</th>
<th>Direct control DUoS</th>
<th>Transmission recovery TUoS</th>
<th>Jurisdictional Scheme Amount Pass Through</th>
<th>Alternative control Metering</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Supply Rate</td>
<td>$/day</td>
<td></td>
<td>-</td>
<td>Locational</td>
<td>If applicable</td>
<td></td>
<td>Fixed daily charge</td>
</tr>
<tr>
<td>Annual Demand Rate</td>
<td>$/kVA/mth</td>
<td>X</td>
<td>Locational</td>
<td>X</td>
<td>-</td>
<td></td>
<td>For peak demand</td>
</tr>
<tr>
<td>Additional demand</td>
<td>$/kVA/mth</td>
<td>X</td>
<td>-</td>
<td>X</td>
<td>-</td>
<td></td>
<td>Demand in excess of that required during summer peak hours.</td>
</tr>
<tr>
<td>Usage Rate</td>
<td>$/kWh</td>
<td>X</td>
<td>if applicable</td>
<td>X</td>
<td>-</td>
<td></td>
<td>For all energy consumption</td>
</tr>
</tbody>
</table>

Table 17 - Subtransmission kVA demand locational tariff charging parameters

Metering charges are discussed separately in this TSS.
6  Indicative Pricing Schedule - Standard control services tariffs

Within the framework of SA Power Networks’ longer term tariff strategy, this Section sets out an indicative pricing schedule for tariff charging components of standard control services for 2017-20. It should be noted that the information in this Section relate to SA Power Networks’ standard control services and pass-throughs. These Network Use of System (NUoS) charges to customers are bundled charges that contain:

- SA Power Networks’ standard control services (DUoS);
- Transmission cost recovery components (TUoS); and
- PV JSA cost recovery components (PV JSA).

The charges bundled to customers can also include alternative control service charges for metering. These charges are explicitly set out in our tariff list, but are part of the total network charges to customers. Metering is discussed separately in a later section.

6.1  Regulatory Requirements

The information in this Section concerning the change in standard control service rates is provided pursuant to clause 6.18.1A of the Rules.

6.18.1A  Tariff structure statement

(e) A tariff structure statement must be accompanied by an indicative pricing schedule which sets out, for each tariff for each regulatory year of the regulatory control period, the indicative price levels determined in accordance with the tariff structure statement.

6.2  Calculation of network use of system tariffs

The price schedules in Appendix A for 2017/18, 2018/19 and 2019/20 are indicative NUoS prices based on certain assumptions. We have used the standard control allowed revenue from the AER’s Final decision plus our forecasts of likely costs for transmission and PV FiT recovery. Actual prices will vary from those shown for a variety of reasons including:

- Changes in the cost of debt, determined annually by the AER;
- Any service incentive scheme bonus/penalty (STPIS);
- Any changes in sales volumes, perhaps from economic growth variations or from customer response to price signals;
- Any outcomes from merit reviews on the AER’s Final Decision. There are appeals by customers and by ourselves on this matter;
- The reset of ElectraNet and Murraylink transmission revenues from July 2018; and
- Any change in the way ElectraNet price their charges, which may occur as part of the July 2018 transmission reset. We will pass on any pricing structure change through our revenue allocation process to tariff classes/tariffs and so through to tariff parameter prices.
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There are valid reasons why prices could be slightly higher or lower than we indicate in Appendix A. However, these are our best estimates of the future prices at this time.

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Distribution (Standard Control only)</td>
<td>682.0</td>
<td>748.2</td>
<td>774.5</td>
<td>801.9</td>
<td>830.9</td>
</tr>
<tr>
<td>PV FiT Recovery</td>
<td>116.6</td>
<td>100.2</td>
<td>90.1</td>
<td>90.1</td>
<td>90.1</td>
</tr>
<tr>
<td>Transmission</td>
<td>263.5</td>
<td>293.2</td>
<td>308.1</td>
<td>314.5</td>
<td>321.0</td>
</tr>
</tbody>
</table>

Table 18 – Indicative price revenue assumptions $M nominal

2015/16 represents amounts forecast to be recovered from customers, ie prices. The subsequent years represent allowed/expected revenues/recoveries that need to be included in prices. Indicative prices in this TSS have been prepared using the 2017/18 revenues highlighted, and have been escalated by forecast price increases for 2018/19 and 2019/20. Forecast annual price increases for the DUoS-based charges (distribution and PV FiT) and for transmission are shown below in Figure 13. Prices for 2016/17 will be determined as part of the annual pricing proposal, to be submitted to the AER on 30 April 2016. That Pricing Proposal will take into account the directions of this proposed TSS and are likely to reflect the level of increase shown in Figure 13 below for 2016/17.

Actual Price Schedules are set out in Appendix A.

Figure 13 - SA Power Networks’ forecast network tariff increases
Pricing of standard control services

This Section demonstrates how SA Power Networks’ network tariffs for 2017-20 will comply with the requirements of the Rules and the AER’s Determination in respect of the pricing X factors, side constraints and pricing principles.

7.1 Regulatory requirements

7.1.1 Rules requirements

Rules clause 6.18.1A (b) specifies that SA Power Networks’ Tariff Structure Statement must comply with the pricing principles for direct control services. These pricing principles are set out in Rule 6.18.5.

An underlying network pricing objective has been specified in Rule 6.18.5 (a) which requires that our tariff charges should reflect our efficient costs of providing these services to customer using these tariffs. Note that efficient costs are determined by the AER in their regulatory determinations.

6.18.5 Pricing principles

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

(f) Each tariff must be based on the long run marginal cost of providing the service to which it relates to the retail customers assigned to that tariff with the method of calculating such cost and the manner in which that method is applied to be determined having regard to:
   (1) the costs and benefits associated with calculating, implementing and applying that method as proposed;
   (2) the additional costs likely to be associated with meeting demand from retail customers that are assigned to that tariff at times of greatest utilisation of the relevant part of the distribution network; and
   (3) the location of retail customers that are assigned to that tariff and the extent to which costs vary between different locations in the distribution network.

(g) The revenue expected to be recovered from each tariff must:
   (1) reflect the Distribution Network Service Provider’s total efficient costs of serving the retail customers that are assigned to that tariff;
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(2) when summed with the revenue expected to be received from all other tariffs, permit the Distribution Network Service Provider to recover the expected revenue for the relevant services in accordance with the applicable distribution determination for the Distribution Network Service Provider; and

(3) comply with sub-paragraphs (1) and (2) in a way that minimises distortions to the price signals for efficient usage that would result from tariffs that comply with the pricing principle set out in paragraph (f).

(h) A Distribution Network Service Provider must consider the impact on retail customers of changes in tariffs from the previous regulatory year and may vary tariffs from those that comply with paragraphs (e) to (g) to the extent the Distribution Network Service Provider considers reasonably necessary having regard to:

(1) the desirability for tariffs to comply with the pricing principles referred to in paragraphs (f) and (g), albeit after a reasonable period of transition (which may extend over more than one regulatory control period);

(2) the extent to which retail customers can choose the tariff to which they are assigned; and

(3) the extent to which retail customers are able to mitigate the impact of changes in tariffs through their usage decisions.

(i) The structure of each tariff must be reasonably capable of being understood by retail customers that are assigned to that tariff, having regard to:

(1) the type and nature of those retail customers; and

(2) the information provided to, and the consultation undertaken with, those retail customers.

(j) A tariff must comply with the Rules and all applicable regulatory instruments.

In respect of pricing side constraints, SA Power Networks is required to comply with Rules clause 6.18.6. This effectively limits the annual movement of revenue recovery between tariff classes such that any tariff class cannot face increases that are more than 2% higher than the average increase for all tariffs. This is a matter for Annual Pricing Proposals and not for this TSS.

7.2 Compliance with pricing principles

This section demonstrates SA Power Networks’ compliance with the pricing principles set out in clause 6.18.5 of the Rules, in particular the pricing principles set out in paragraphs (e) to (j).

7.2.1 Clause 6.18.5(e) Stand-alone and Avoidable costs

Paragraph (e) requires SA Power Networks to ensure that the revenue recovered for each tariff class lies between:

- An upper bound, representing the Stand-alone cost of serving the retail customers who belong to that class; and
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- A lower bound, representing the Avoidable cost of not serving those retail customers.

The Stand-alone and Avoidable cost methodologies are described in detail in Appendix C of this TSS. These approaches are used to calculate the revenues for each standard control services tariff class associated with each cost methodology. These costs are compared with the weighted average revenue derived from SA Power Networks’ proposed tariffs.

The revenue expected to be recovered from each of SA Power Networks’ tariff classes in 2017/18 is compared with the Stand-alone and Avoidable costs (see Appendix C) in Table 19.

<table>
<thead>
<tr>
<th>Tariff class</th>
<th>Stand-alone cost</th>
<th>Tariff revenue</th>
<th>Avoidable cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Major business</td>
<td>$96</td>
<td>$8</td>
<td>$5</td>
</tr>
<tr>
<td>HV business</td>
<td>$108</td>
<td>$33</td>
<td>$4</td>
</tr>
<tr>
<td>DTF Business</td>
<td>$257</td>
<td>$146</td>
<td>$37</td>
</tr>
<tr>
<td>LV business</td>
<td>$326</td>
<td>$177</td>
<td>$57</td>
</tr>
<tr>
<td>LV residential</td>
<td>$677</td>
<td>$409</td>
<td>$269</td>
</tr>
</tbody>
</table>

Table 19 - Stand-alone and Avoidable distribution network costs 2017/18 ($ M)

SA Power Networks’ tariff classes lie within the subsidy free range, in that the expected DUoS revenue collected from each tariff class lies between the Avoidable and Stand-alone costs of supply and therefore meet the requirements of clause 6.18.5(e) of the Rules.

7.2.2 Clause 6.18.5(f) Long Run Marginal Costs

Paragraph (f) requires each tariff to be based on the LRMC of providing the service to the customers on that tariff.

SA Power Networks’ approach to the calculation of the network LRMC for its tariff classes is set out in Appendix B of this TSS. The approach has not been altered from that used in the 2010/11 Pricing Proposal and the sole changes have been to index the outcomes by CPI each year and to amend the calculations for the inclusion of a fifth tariff class (Distribution Transformer Business).

These calculations are carried out at various voltage and voltage transformation levels of the network including:

- Sub-transmission;
- Zone substation;
- High voltage;
- Distribution transformers; and
- Low voltage.

The marginal cost at each network voltage level has been determined using the following relationship:
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\[ LRMC(AIC) = \frac{PV(\text{growth related capex}) + PV(\text{growth related opex})}{PV(\text{incremental demand})} \]

Where:

- \textit{growth related capex} is the annualised capital expenditure to meet the additional demand and new customer connections forecast over the forecast period;

- \textit{growth related opex} is the incremental annual cost of operating and maintaining the newly constructed network and connection assets over the forecast period; and

- \textit{incremental demand} is the forecast change in kVA demand compared with the base year.

To provide confidence in the reasonableness of these long-run estimates, we have compared these LRMC calculations to those used by Victorian distributors in their 2017-2020 TSS. The Victorian network is similar to SA Power Networks’ with privatised ownership and similar network contingency arrangements (Queensland and NSW are government owned and have different contingency arrangements). The Victorian and SA networks also have similar weather, albeit slightly less extreme in summer in Victoria. Victoria has on average more customers per kilometre. Given that we are trying to prepare an LRMC for use with state-wide pricing that reflects costs for the majority of customers, checking against LRMC prices with a network similar to ours but with less of the long rural lines provides a useful price comparison. Note that as SA Power Networks is required by SA Government legislation to use state-wide pricing of distribution services, we have not considered locational LRMC differences.

The chart below compares SA Power Networks’ estimate of LRMC with the average of the Victorian distributors and each Victorian distributor. Some assumptions have been made to enable this comparison. The chart shows that the LRMC prices are reasonable. We plan to refine and further validate these prices using the efficient costs recently determined by the AER in the Final Determination, for use in our Revised TSS due for submission in 2016 Quarter 3.
A comparison of SA Power Network’s Stand-alone, Avoidable, LRMC and average distribution prices for the five tariff classes is shown in Figure 15.

![Graph](image-url)

**Figure 15 - Cost comparison ($/kVA per annum)**

It can be noted from Figure 15 that:
The average prices for each network tariff class fall within the bounds of the Stand-alone and Avoidable costs and hence are subsidy-free;

The average price proposed to be charged as tariffs to recover the total efficient costs for that tariff class exceeds the LRMC for that tariff class. Some of the tariff recovery will use price signals aimed at minimising distortions to efficient usage; and

The exception to this appears to be Major Business. The LRMC for Major Business may appear to be high against our calculation but reasonable against the Victorian calculations. We propose to review the Major Business LRMC in our Revised TSS.

A demand-based tariff parameter should indicate to customers the LRMC of their utilisation of the network. For simplicity, we have taken the forecast revenue recovery from the demand parameters for these tariffs, divided that revenue by the diversified peak kVA for that tariff’s customers and then compared the implied $/kVA signal with the estimates of LRMC.

<table>
<thead>
<tr>
<th>Price signal $/kVA pa</th>
<th>SAPN LRMC $/kVA pa</th>
<th>Victorian DBs Ave LRMC $/kVA pa</th>
<th>Comment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sub-transmission agreed kVA demand</td>
<td>$18</td>
<td>$36</td>
<td>$22</td>
</tr>
<tr>
<td>Zone substation agreed kVA demand</td>
<td>$52</td>
<td>$66</td>
<td>$41</td>
</tr>
<tr>
<td>High Voltage agreed kVA demand</td>
<td>$63</td>
<td>$80</td>
<td>$59</td>
</tr>
<tr>
<td>Low Voltage agreed kVA demand</td>
<td>$101</td>
<td>$108</td>
<td>$102</td>
</tr>
<tr>
<td>Business actual kVA demand</td>
<td>$124</td>
<td>$122</td>
<td>$105</td>
</tr>
<tr>
<td>Business actual kW demand</td>
<td>$118</td>
<td>$122</td>
<td>$105</td>
</tr>
<tr>
<td>Business actual kW demand transition</td>
<td>$50</td>
<td>$122</td>
<td>$105</td>
</tr>
<tr>
<td>Residential actual kW demand</td>
<td>$117</td>
<td>$122</td>
<td>$102</td>
</tr>
<tr>
<td>Residential actual kW demand transition</td>
<td>$50</td>
<td>$122</td>
<td>$102</td>
</tr>
</tbody>
</table>

1. kW tariffs have been converted to kVA equivalent for comparison with LRMC
2. Price signal calculated by dividing the DUoS and PV FIT tariff demand parameter revenue by diversified kVA demand for that tariff'se customers
3. PV FIT included as it is part of an overall $/kVA signal whilst treating all distribution customers equally for PV FIT recovery
4. Residential actual kW demand is currently at 57% of LRMC. The price nand customer impacts to be reviewed further
5. Business actual kW demand not shown as likely take-up uncertain. Demand component is set at the Victorian Average LRMC of $102/kVA

Table 20 – Comparison of tariff parameter prices and LRMC estimates for $/kVA

The table shows that our demand tariffs at the price levels indicated are a good fit with the LRMC estimates. The transition tariffs proposed for 2017/18 reflect the desired approximately 40% of demand price signal per our transition strategy.

We have not endeavoured to analyse the degree to which the usage-based tariffs used by most customers of the LV Business and Residential tariff classes signal LRMC as the signal is poor. We do note though that these tariffs reflect the total efficient costs of serving the customers assigned to that tariff, as required by clause 6.18.5(g)(1). This comprises the LRMC and the balance of other efficient costs.

We further note that our proposed residential Solar PV Tariff (if permitted by Judicial Review) is also aimed at ensuring that these customers have a tariff that reflects their total efficient costs, varying only from the costs reflected in the residential tariff to the degree that the load profiles of the two sets of customers vary. We cover this issue below in more detail.
7.2.3 **Clause 6.18.5(g) Tariffs reflect total efficient costs**

The way in which the LRMC and the balance of efficient costs has been taken into account by SA Power Networks in establishing the 2017/18 tariffs has involved the following considerations:

- **Ensuring that demand price signalling components reasonably signal the LRMC**: as discussed above in section 7.2.2;

- **Use of price signalling components where practicable**: In Type 6 metering situations where demand cannot be effectively signalled, energy rates have been structured to ensure that efficient costs are recovered from the tariff’s customers. Unfortunately, the metering does not indicate usage during high consumption periods so we have retained relatively simple tariff structures which recover the efficient costs for that tariff’s assigned customers; and

- **Revenue recovery through non-distortionary charging parameters**: For cost reflective tariffs, demand charging parameters recover a proportion of the total revenue reflecting high network utilisation periods. The balance of revenue recovery takes place in the least distortionary manner possible, through fixed supply charges for the efficient costs of local assets and customer service with the balance recovered through the energy usage rates that apply. Lower rates apply to usage that is outside of high network utilisation periods such as off peak periods (for 2-rate tariffs) and controlled load.

The model below outlines how SA Power Networks allocates the revenue across tariff classes and across tariffs. This ensures that tariffs reflect the efficient costs incurred in supplying customers using those tariffs. A few key points of explanation are set out below. Note that the model shows how the direct control service costs are allocated but also shows the methods for recovery of Designated Pricing Proposal Charges under clause 6.18.7 of the Rules (also known as Transmission) and of Jurisdiction Scheme Amounts under clause 6.18.7A (also known as the Solar PV Feed in Tariff).
Distribution costs of $775M are allocated across the tariff classes (and the tariffs) according to the usage by customers of the voltage steps involved. The efficient costs are apportioned across these asset categories, with customer use of these assets determined by the customers’ diversified demand and usage. Some assets are apportioned according to customer numbers eg the asset Services and a portion of the asset LV Lines reflecting house frontage needs. Tariff classes (and so customers) are only charged for an asset category if they use it.

We allocate 50% of asset charges to demand as we have found (in conjunction with a DUoS uplift from PV FiT recovery) that these amounts generally reflect the LRMC of these assets. The balance of asset charges is allocated in a non-distortionary manner using energy, apart from those costs which are driven principally by numbers of customers. Note that as we have State-wide pricing requirements under SA Government legislation, we do not consider the issue of distance (eg long or short feeders) or location (eg urban or rural) in these calculations. If we need to consider pricing for a potentially constrained network, we will look at other variations to this for those specific locations, and consider an 'opt-in' tariff. The tariff variation might have a stronger demand signal reflecting the local LRMC. Customers would retain the right to access State-wide prices despite the constraint. We use the distribution charges allocation as our basis for recovery of PV FiT (under clause 6.18.7A). This method results in a balanced allocation of costs across SA for this SA Government initiative.
Alternative approaches which use a $/customer charge would fall on small customers more heavily whilst a $/kWh usage charge would fall on large customers more heavily. We have used this DUoS uplift approach for PV FiT recovery since 2009. Note that we have included the effect of uplifting the DUoS demand charges by the 11.6% for PV FiT when checking for compliance with LRMC signals, as this forms part of the overall demand price signal received by customers.

We apply the ElectraNet pricing structure where possible as our basis for allocating and pricing the recovery of designated pricing proposal charges under clause 6.18.7 (transmission). For our Major Business tariff class, each customer is priced individually according to their location and their demand/energy characteristics. They receive the same transmission price as if they were directly connected to the transmission network. For all other tariff classes, we apply a State-wide average price but passing through the intent of ElectraNet’s prices, for example:

- The locational charges for transmission exits and locational TUoS are summed and allocated evenly across all customers according to their diversified demand. Where we have demand components in our tariffs, these costs are reflected in that tariff parameter. Where we don’t, these costs are included in the usage charges (but not in off-peak or in controlled load usage).

- The non-locational and common service charges are allocated to tariff classes according to the load factor of that tariff class. ElectraNet have an either/or price for these charges, with a maximum $/kW charge suitable for tariff classes with above-average load factor and a maximum $/MWh charge suitable for tariff classes with below average load factor. We allocate the LV Business and Residential tariff classes on the $/MWh basis (as that is the minimum cost that can be assigned) with the balance of these costs allocated to the other three larger customer tariff classes (as these have above average load factor) with the amounts split amongst the tariff classes according to diversified demand. This results in a lower allocation of costs than if the ElectraNet $/MWh option was used.
  - Having determined a fair allocation of these non-locational and common service costs to the different tariff classes and tariffs, we then recover these costs on a $/MWh basis as a non-distortionary option (ElectraNet). The key pricing signal provided by ElectraNet is through the exit charges and locational transmission charges, which we price through demand charges where possible.

The revenue cost allocation model enables us to reasonably apportion our charges across customers in a manner which ensures good cost-reflectivity for state-wide prices. It also provides guidance for the subsequent conversion of allocated costs to prices, which can be checked against LRMC estimates for suitability of demand signals.

Clause 6.18.5(g)(3) requires us to price in a way that, whilst recovering efficient costs from all tariffs and basing (where possible) the tariffs on LRMC, the balance of efficient costs should be recovered in a way that minimises efficient usage price signals. We incorporate this aspect in our Social tariff. For the distribution tariff parameters, we have proposed to eliminate the fixed supply charge as it does not signal the LRMC of supply but impacts unfavourably on efficient consumption by customers.
who have a high price elasticity of demand due to their hardship situation. We also proposed to not recover any PV FiT from these customers which again is not an LRMC-based charge nor is it an efficient cost. It is just a cost recovery. Clause 6.18.7A (Recovery of jurisdictional scheme amounts) does not have any pricing principles. The use of a Social tariff is under Judicial Review by the Federal Court.

7.2.4 Clause 6.18.5(h) and (i) Customer impact and understanding of tariffs

Clause 6.18.5(h) requires us to consider the impact on customers of annual changes in prices. This will mainly be an annual Pricing Proposal matter but, to the extent that we are staging the introduction of cost reflective prices over the 2017-20 period, this clause has application to the TSS. We are required to balance out the competing needs of having tariffs that comply with the pricing principles (ie are cost reflective), the time necessary for a period of transition to such tariffs, the degree of customer choice available for tariffs and the extent to which customers can mitigate tariff impacts through usage decisions. Clause 6.18.5(i) goes further to require us to structure our tariffs in a way that can be understood by that tariff’s customers, with some consideration of information available to and consultation with those customers.

Our approach is to make definite progress towards cost reflective tariffs for small customers in the 2017-20 period, but at a slower rate than Victorian initiatives. We consulted extensively with stakeholders regarding customer impacts, and this has influenced our strategies here. We discuss a set of Customer Impact Principles in Section 3 and also in the companion Overview Paper which go into more detail on this particular matter. Our tariff strategies concluded from this consultation are shown below.

- We have proposed that all small customers assigned to cost reflective tariffs in this period 2017-20 will have access to a tariff where the demand element is approximately 40% of LRMC (and the usage charges are resultantly higher).

- We have also proposed that only a limited number of customers should face such tariffs, ie new customers, customers who make significant changes to their electricity supply and the larger of these small customers who exceed an annual usage threshold (10,000 small business customers with usage exceeding 40 MWh and 3,000 small residential customers with usage exceeding 20 MWh). We expect the majority of these customers will not face price increases from these tariffs, but there will be some who will. Those who do face price increases will need the extended duration of transition to consider their possible response to cost reflective prices. Most customers should get small savings, some larger savings and these customers may opt-in to fully cost reflective tariffs.

- We anticipate that 87% of existing business customers and 99.5% of existing residential customers will not be required to face cost reflective tariffs in the 2017-20 period. It may be that some of these customers will opt-in to the cost reflective tariff. Some learnings from this experience will be important to any mandatory roll-out of cost reflective pricing to those other smaller customers using advanced interval meters in the 2020-25 period.
SA Power Networks

- We propose to encourage small customers to opt-in to the cost reflective tariff prior to being mandatorily reassigned by threshold usage levels. We will offer a ‘can’t lose’ guarantee for customers with multiple NMIs, to learn about their electricity requirements under cost reflective tariffs with the possibility of making savings but without the risks of making losses. We believe that such a program could deliver a critical mass of customer response which will assist in developing information able to be provided to other customers when they either elect to opt-in or are mandatorily reassigned to a cost reflective tariff in the future. It will also support development of intermediaries that can provide advice to customers on optimal solutions for both network and energy procurement.

SA Power Networks considers this to be a reasonable balance in determining the speed of small customer cost reflective prices, customer choice of tariffs and the discovery of ways in which customers can mitigate the impacts of such tariffs. We should see some customer response from the mandatory reassignments, but are hopeful of greater response to the voluntary ‘opt-in’ ‘can’t lose’ program.

SA Power Networks’ 2017/18 tariffs as outlined in this TSS have therefore been structured in compliance with the pricing principles of clauses 6.18.5 of the Rules.
Customer tariff class assignment and reassignment

The requirements concerning the assignment and reassignment of customer to tariff classes are set out in clause 6.18.4 of the Rules and Attachment 14 Appendix D of the AER’s 2015-20 Determination.

8.1 Regulatory Requirements

8.1.1 Rules requirements

In making a distribution determination, the AER is required to formulate provisions for the assignment and reassignment of customers to tariff classes, in accordance with the principles set out in clause 6.18.4 of the Rules. This Rule covers the following matters:

- Factors governing the assignment of customers to tariff classes;
- Equitable treatment of customers with micro-generation;
- The review of the DNSP decision on tariff class assignment; and
- The review of DNSPs’ tariff structures containing energy or demand related charges.

8.1.2 Requirements of the AER’s Decision

In accordance with the principles in clause 6.18.4 of the Rules, Attachment 14, Appendix D of the AER’s Determination sets out the procedures to apply to assigning or reassigning customers to tariff classes. These provisions are in several parts, covering the following aspects:

- Assignment of existing retail customers to tariff classes at the commencement of the forthcoming regulatory control period;
- Assignment of new retail customers to a tariff class during the next regulatory control period;
- Reassignment of existing retail customers to another existing or a new tariff during the next regulatory control period;
- Objections to proposed assignments and reassignments; and
- System of assessment and review of the basis on which a retail customer is charged.

These requirements are reproduced here:

D.3 Procedures for assigning or reassigning retail customers to tariff classes

The procedure outlined in this section applies to direct control services.

---

AER, Determination, October 2015, Attachment 14
Assignment of existing retail customers to tariff classes at the commencement of the 2015–20 regulatory control period

1. SA Power Networks' customers will be taken to be "assigned" to the tariff class which SA Power Networks was charging that customer immediately prior to 1 July 2015 if:

   (a) they were an SA Power Networks customer prior to 1 July 2015, and
   (b) they continue to be a customer of SA Power Networks as at 1 July 2015.

Assignment of new retail customers to a tariff class during the forthcoming regulatory control period

2. If, after 1 July 2015, SA Power Networks becomes aware that a person will become a customer of SA Power Networks, then SA Power Networks must determine the tariff class to which the new customer will be assigned.

3. In determining the tariff class to which a customer or potential customer will be assigned, or reassigned, in accordance with paragraphs 2 or 5, SA Power Networks must take into account one or more of the following factors:

   (a) the nature and extent of the customer’s usage
   (b) the nature of the customer’s connection to the network
   (c) whether remotely-read interval metering or other similar metering technology has been installed at the customer's premises as a result of a regulatory obligation or requirement.

4. In addition to the requirements of paragraph 3, SA Power Networks, when assigning or reassigning a customer to a tariff class, must ensure:

   (a) customers with similar connection and usage profiles are treated equally
   (b) customers who have micro-generation facilities are not treated less favourably than customers with similar load profiles without such facilities.

Reassignment of existing retail customers to another existing or a new tariff class during the 2015–20 regulatory control period

5. SA Power Networks may reassign an existing customer to another tariff class in the following situations:

   (a) SA Power Networks receives a request from the customer or customer's retailer to review the tariff to which the existing customer is assigned; or
   (b) SA Power Networks believes that:
      i. an existing customer's load characteristics or connection characteristics (or both) have changed such that it is no longer appropriate for that customer to be assigned to the tariff class to which the customer is currently assigned, or

14 We interpret 'nature' to include the installation of any technology capable of supporting time based tariffs.
ii. a customer no longer has the same or materially similar load or connection characteristics as other customers on the customer's existing tariff, then SA Power Networks may reassign that customer to another tariff class.

In determining the tariff class to which a customer will be reassigned, SA Power Networks must take into account paragraphs 3 and 4 above.

Notification of proposed assignments and reassignments and rights of objection for standard control services

6. SA Power Networks must notify the customer’s retailer in writing of the tariff class to which the customer has been assigned or reassigned, prior to the assignment or reassignment occurring.

7. A notice under paragraph 6 above must include advice informing the customer’s retailer that they may request further information from SA Power Networks and that the customer or customer’s retailer may object to the proposed reassignment. This notice must specifically include:

   (a) a written document describing SA Power Networks’ internal procedures for reviewing objections, if the customer or customer’s retailer provides express consent, a soft copy of such information may be provided via email
   (b) that if the objection is not resolved to the satisfaction of the customer or customer’s retailer under SA Power Networks’ internal review system within a reasonable timeframe, then, to the extent resolution of such disputes are within the jurisdiction of the Energy and Water Ombudsman South Australian, or like officer, the customer or customer’s retailer is entitled to escalate the matter to such a body
   (c) that if the objection is not resolved to the satisfaction of the customer or customer’s retailer under SA Power Networks’ internal review system and the body noted in paragraph 7(b) within a reasonable timeframe, then the customer or customer’s retailer is entitled to seek a decision of the AER via the dispute resolution process available under Part 10 of the NEL.

8. If, in response to a notice issued in accordance with paragraph 6 above, SA Power Networks receives a request for further information from a customer or a customer’s retailer, then it must provide such information within a reasonable timeframe. If SA Power Networks reasonably claims confidentiality over any of the information requested, then it is not required to provide that information. If the customer or customer’s retailer disagrees with such confidentiality claims, he or she may have resort to the dispute resolution procedures referred to in paragraph 7 above, (as modified for a confidentiality dispute).

9. If, in response to a notice issued in accordance with paragraph 6 above, a customer or customer’s retailer makes an objection about the proposed assignment or reassignment, SA Power Networks must reconsider the proposed assignment or reassignment. In doing so SA Power Networks must take into consideration the factors in paragraphs 3 and 4 above, and notify the customer or customer’s retailer in writing of its decision and the reasons for that decision.
10. If an objection to a tariff class assignment or reassignment is upheld by the relevant body noted in paragraph 7 above, then any adjustment which needs to be made to tariffs will be done by SA Power Networks as part of the next network bill.

11. If a customer or customer's retailer objects to SA Power Networks' tariff class assignment, SA Power Networks must provide the information set out in paragraph 7 above and adopt and comply with the arrangements set out in paragraphs 8, 9 and 10 above in respect of requests for further information by the customer or customer's retailer and resolution of the objection.

Notification of proposed assignments and reassignments and rights of objection for alternative control services

12. SA Power Networks must make available information on tariff classes and dispute resolution procedures referred to in paragraph 7 above to retailers operating in SA Power Networks' distribution area.

13. If SA Power Networks receives a request for further information from a customer or customer's retailer in relation to a tariff class assignment or reassignment, then it must provide such information within a reasonable timeframe. If SA Power Networks reasonably claims confidentiality over any of the information requested, then it is not required to provide that information. If the customer or customer's retailer disagrees with such confidentiality claims, he or she may have resort to the dispute resolution procedures referred to in paragraph 7 above, (as modified for a confidentiality dispute).

14. If a customer or customer's retailer makes an objection to SA Power Networks about the proposed assignment or reassignment, SA Power Networks must reconsider the proposed assignment or reassignment. In doing so SA Power Networks must take into consideration the factors in paragraphs 3 and 4 above, and notify the customer or customer's retailer in writing of its decision and the reasons for that decision.

15. If an objection to a tariff class assignment or reassignment is upheld by the relevant body noted in paragraph 7 above, then any adjustment which needs to be made to tariffs will be done by SA Power Networks as part of the next network bill.

System of assessment and review of the basis on which a retail customer is charged

16. Where the charging parameters for a particular tariff result in a basis charge that varies according to the customer's usage or load profile, SA Power Networks will set out in its pricing proposal a method of how it will review and assess the basis on which a customer is charged.

8.2 Assignment of new customers to a tariff class

The approach that SA Power Networks applies to the tariff assignment of new and upgraded customer connections has been developed over the years since the formation of the NEM.
In this Section of the TSS, SA Power Networks describes the process it applies to the initial assignment of customers to tariffs and to their reassignment. Notwithstanding that the individual tariffs have been grouped within tariff classes in this TSS, the existing approach to managing tariff assignment and reassignment is demonstrated to align with the requirements established by the AER. Accordingly, no change is required to current practices.

Note that whilst we are creating a different tariff class in this TSS for Distribution Transformer business customers, the tariff to which these customers are currently assigned is a mirror image of the tariff for the LV Business tariff class.

The process whereby new customers are assigned to tariff classes and tariffs, following the receipt of a connection application by the customer or their retailer, follows the decision tree shown in Figure 17. In the application of this process, a customer that lodges an application to modify or upgrade an existing network connection is treated in the same manner as a new customer. The tariff classes and tariffs in this Figure 17 relate to the 2010-15 regulatory period, but the concepts of assignment are unchanged, albeit with an extra tariff class and extra tariffs.

This decision tree in Figure 17 highlights the existing process whereby customers are assigned to a tariff class and then to an individual tariff. The process relies upon a systematic sequence of decisions based on the information provided with the customer’s application for supply. Decisions associated with assignment to the four tariff classes have been separately identified in red. Second-
order decisions on individual tariffs are also shown. These relate to type of meter, load size and billing frequency, and lead to the customer’s assignment to a specific tariff within the tariff class. The two major decisions that determine the tariff class assessment are as follows:

- The nature of a customer’s usage: (ie residential, business, or unmetered); and
- For business customers only, the nature and extent of the associated connection to the network (the connection voltage, whether located within in the network or directly connected to a zone substation or transformer).

### 8.2.1 Customers with micro-generation

As SA Power Networks’ tariff class assignment process is applied to the net customer demand on the network, it does not distinguish between customers that have micro-generation and those without. The only aspects of the connection process that distinguish customers with micro-generation are technical requirements, principally to ensure public and employee safety in the event of disconnection of supply to a site with generation.

We have proposed (Judicial Review permitting) to have a residential with Solar PV tariff (single rate) for those customers who also use PV. We have used the same revenue allocation process to this tariff as we have done with residential, and so we believe we have fairly and equally treated these two residential load profiles for the difference in their load with and without PV used in-house.

### 8.3 Reassignment of existing customers to another existing or a new tariff during the next regulatory control period

Within each tariff class, there has been and will continue to be movement between individual tariffs. This will be particularly the case with the small customers on the Low Voltage Business tariff class and Residential tariff class over the 2017-20 period. Much of the tariff optimisation for large customers has been concluded in 2015/16.

The five tariff classes that SA Power Networks has established are sufficiently broad to ensure that all the existing customers are within the appropriate tariff class and that it is unlikely that customers will seek to migrate or be reclassified to a different tariff class during the course of the determination. Transfer between tariff classes would be limited to circumstances where the nature of usage or level of consumption changed significantly, for example where a residence was redeveloped to become a small business such as a medical surgery or office. Customers in the LV Business tariff class have access to mirror-image tariffs of those otherwise used by DTF Business tariff class customers.

Notwithstanding that the reassignment of customers’ tariff classes is unlikely during the 2015-20 regulatory control period, SA Power Networks would do so in accordance with the provisions of the AER’s Decision.

SA Power Networks follows the same processes for customers being reassigned to another tariff within a tariff class as would apply to customers being reassigned to another tariff class. Customers
8.4 Objections to proposed assignments and reassignments

The AER has established requirements that SA Power Networks must follow in assigning or reassigning customers to tariff classes and in responding to objections to SA Power Networks’ tariff class assignments.

The requirements that SA Power Networks must follow have been documented in an internal procedure entitled “Manual 18, Network Tariff Manual” which is published on SA Power Networks’ website.

The relevant part of this document is attached as to this TSS as Appendix D.
9 Alternative Control Services – metering services

The approach to metering in the National Electricity Market (NEM) is changing. This provides a very important context for this TSS. As stated by the AER\textsuperscript{15}:

“Our final decision on SA Power Networks’ metering proposal is made in the context of ongoing policy reform. We based our assessment on the National Electricity Rules (NER) in place at the time of this final decision, but have had regard to the likelihood of policy reform in the future through rule changes that will apply during this regulatory period.

Currently, competition in metering is limited to large customers in the national electricity market while regulated distributors have the sole responsibility to provide small customers with metering services.\textsuperscript{16}

The Australian Energy Market Commission (AEMC) is undertaking a rule change process to expand competition in metering and related services to help facilitate a market led roll out of advanced metering technology, following proposals from the COAG Energy Council. The increased availability of advanced meters will enable the introduction of more cost reflective network prices and allow consumers to make more informed decisions about how they want to use energy services.”

As mentioned, the Australian Energy Market Commission (the ‘rule maker’) undertook major changes to the Rules on roles and responsibilities for metering. This will mean that we will no longer manage small customer metering in SA from December 2017. Instead, this will be managed by retailers (and other potential competitors) in a competitive market. This opens up the possibility of new metering options for customers, but creates a significant level of uncertainty regarding the timing and speed of a changeover to smart meters.

Under these metering rule changes, there will not be a compulsory roll out of advanced meters, but we understand they will start appearing in the market in a number of ways:

- As new customers are connected or major alterations are made to an existing electrical supply\textsuperscript{17};
- The replacement of ageing and failed meters;
- Customers choosing to have their electricity retailer arrange for the installation of an advanced interval meter; and
- Retailer-initiated advanced meter installation.

\textsuperscript{15}AER – Final decision SA Power Networks distribution determination- Attachment 16 – Alternative control services – October 2015, p7
\textsuperscript{16}NER clause 7.2.3(a). Small customers refers to any customer with less than 160MWh annual consumption (effectively all residential and small business customers fall into this category).
\textsuperscript{17}‘Additions and alterations’ include new homes, major renovations, three phase upgrades, solar PV etc but not the simple replacement of a meter or relocating (but not upgrading) a switchboard
SA Power Networks

9.1.1 Metering Charges

This section of the TSS provides visibility of SA Power Networks’ metering charges for the period from 2015-2020.

The AER has determined a price cap for alternative control services (metering services) in the 2015-20 Determination. Attachment 16 to the Final Decision sets out all of the pricing arrangements and the final prices that will apply. Part A of Attachment 16 sets out the annual metering charges (AER Table 16.11) and the upfront capital charges (Table 16.14, with annual X-factors set out in AER Table 16.15).

The annual metering charges contain a Capital and a non-Capital charge, with different prices applying to the three categories of alternative control services metering, ie WC (whole current), CT (current transformer) and Exceptional meters.

There are four different combinations of metering fees possible:

- Existing customers using SA Power Networks’ meters installed prior to July 2015. These customers continue to pay the capital and non-capital charges.
- Where a customer after June 2015 has an SA Power Networks’ meter from pre June 2015 replaced by an alternate meter provider eg a Type 4 meter from the retailer, the customer/retailer will continue to pay the capital-related charge, but will cease paying the non-capital related charge.
- Where a new customer connects to the network from July 2017 through November 2017 and elects to use an SA Power Networks meter, the customer incurs an upfront capital charge, and also incurs the annual non-capital charge. The customer is not liable for any ongoing capital charges. The customer could elect to have the retailer install a meter when first connecting, in which case the upfront capital charges and annual non-capital charge would not apply.
- Where an existing customer at June 2015 was not using an SA Power Networks meter but that of an alternate meter provider, eg a Type 4 meter, that customer is not liable for any annual metering charges to SA Power Networks in the 2015-20 period.

We have implemented the AER’s preferred system of meter service pricing, separate from the standard control services tariffs.

Table 21 shows the annual metering charges that apply in 2015-20.

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18 WC = “whole current”, CT = “current transformer” for loads too large for the meter to read current directly
Table 21 – Alternative Control Services – Annual metering charges

Table 22 shows the Upfront capital charges that apply in 2015-20. The AER prices have been escalated by an assumed CPI of 2.5% and by the application of the AER’s X-factor. We do not expect these prices to apply from December 2017 as retailers will then have responsibility for all meter installations and replacements under the new AEMC Rule change.

Table 22 – Alternative Control Services – Upfront Capital charges
Appendices

Appendix A: Network Use of System Tariffs and Explanatory Notes
Appendix B: Long Run Marginal Cost Methodology
Appendix C: Stand-alone and Avoided Cost Methodologies
Appendix D: Procedure for Assigning and Reassigning Customers to Tariff Classes
Appendix E: Regulatory Compliance Checklist
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SA Power Networks Tariff Structure Statement 2017-2020: Appendix A
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<td>2017-22 Transition Tariffs - Small Customers</td>
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<tr>
<td>July 2015 Transition Tariffs - Large Customers</td>
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</table>
Notes accompanying 2017/18 to 2019/20 Proposed Tariffs

Notes:

1. Network tariffs are determined on a GST exclusive basis. GST is added to the distribution tariffs.

2. SA Power Networks must assign each Distribution Network User to a distribution tariff in respect of each of its connection points in accordance with the following principles.

Use of Cost-Reflective Tariffs (demand based)

(a) A Business Distribution Network User that connected to or altered the supply arrangements with the Distribution Network from 1 July 2010 and requiring more than 100 amps (70 kVA) supply must be assigned to a distribution network tariff that includes a demand component in respect of that connection point.

(b) A Business Distribution Network User connected to the Distribution Network that has a maximum demand of 250 kVA or more in respect of a connection point, must be assigned to a distribution tariff that includes a demand component in respect of that connection point.

(c) From 1 July 2015, a Business Distribution Network User connected to the Distribution Network that would qualify as a large customer (annual usage of 160 MWh or more) must be assigned to a distribution network tariff that includes a demand component in respect of that connection point. If the customer has a Type 6 meter, then a transition business single-rate or transition business 2-rate tariff must be used until a Type 1-5 meter is installed.

(d) From 1 July 2017, a Business Distribution Network User connected to the Distribution Network that would qualify as a small business customer but has annual usage of 40 MWh or more must be assigned to a distribution network tariff that includes a demand component in respect of that connection point. If the customer has a Type 6 meter, then a transition business single-rate or transition business 2-rate tariff must be used until a Type 1-5 meter is installed.

(e) From 1 July 2017, a Residential Distribution Network User connected to the Distribution Network that would qualify as a residential customer but has annual usage of 20 MWh or more must be assigned to a distribution network tariff that includes a demand component in respect of that connection point. If the customer has a Type 6 meter, then a transition residential single-rate tariff must be used until a Type 1-5 meter is installed.

(f) A new Business Distribution Network User connecting or an existing Business Distribution Network User altering the supply arrangements to the Distribution Network from 1 July 2015 and requiring multi-phase supply must be assigned to a distribution network tariff that includes a demand component in respect of that connection point. A Type 1-5 meter is required at such sites. Customers should note that where they choose to have a Type 1-4 meter, they have the right to exercise choice regarding their metering service provider. Installation of a Type 1-5 meter by itself is not an alteration to supply, but installation of an inverter, eg for Solar PV Equipment or Battery Storage, is an alteration to supply.

(g) A new Distribution Network User (Business or Residential) connecting or an existing Distribution Network User (Business or Residential) altering the supply arrangements to the Distribution Network from 1 July 2017 must be assigned to a distribution network tariff that includes a demand component in respect of that connection point. A Type 1-5 meter is required at such sites. Customers should note that where they choose to have a Type 1-4 meter, they have the right to exercise choice regarding their metering service provider. Installation of a Type 1-5 meter by itself is not an alteration to supply, but installation of an inverter, eg for Solar PV Equipment or Battery Storage, or of electrical appliance exceeding 25 amps, eg large airconditioning or fast battery recharger, is an alteration to supply.
Specific Tariff Requirements

(h) A Sub-Transmission (kVA) Demand customer is a Distribution Network User taking supply at 66 kV, or at 33 kV outside of the Adelaide Metropolitan area. A minimum anytime maximum demand of 5 MVA applies to the agreed demand tariff. A NEM compliant Type 1-4 interval meter is required with the ability to measure both active and reactive power. Customers should note that they have the right to exercise choice regarding their Type 1-4 meter metering service provider. Customers using more than 10 MW and/or 40 GWh pa are required to have a locationally determined transmission price. These tariffs are invoiced monthly and agreed demand is levied on a per-day basis.

(i) A Zone Substation (kVA) Demand customer is a Distribution Network User taking supply generally at 11kV from the low voltage transformer terminals. Supply may also be taken at lower voltages that exceed 1 kV. A minimum anytime maximum demand of 5 MVA applies to the agreed demand tariff. A NEM compliant Type 1-4 interval meter is required with the ability to measure both active and reactive power. Customers should note that they have the right to exercise choice regarding their Type 1-4 meter metering service provider. Customers using more than 10 MW and/or 40 GWh pa are required to have a locationally determined transmission price. These tariffs are invoiced monthly and agreed demand is levied on a per day basis.

(j) A High Voltage (kVA) Demand customer is a Distribution Network User taking supply generally at 11 kV. Supply may also be taken at lower voltages that exceed 1 kV or at 33 kV in metropolitan Adelaide. A NEM compliant Type 1-4 interval meter is required with the ability to measure both active and reactive power. Customers should note that they have the right to exercise choice regarding their Type 1-4 meter metering service provider. The customer may elect to use the HV agreed demand tariff, the HV actual demand tariff or the HV <400 kVA agreed demand tariff. These tariffs are invoiced monthly and agreed demand is levied on a per day basis.

(k) A High Voltage Sports Ground (kVA) Demand customer is a Distribution Network User taking supply generally at 11 kV that utilizes a significant quantity of sportground floodlighting. Supply may also be taken at lower voltages that exceed 1 kV or at 33 kV in metropolitan Adelaide. The time periods when the demand is measured are set out in 4 (c) below. A NEM compliant Type 1-4 interval meter is required with the ability to measure both active and reactive power. Customers should note that they have the right to exercise choice regarding their Type 1-4 meter metering service provider. The customer may elect to use the tariff options available under 2 (j) above. These tariffs are invoiced monthly and agreed demand is levied on a per day basis.

(l) A Low Voltage (kVA) Agreed Demand customer is a Distribution Network User generally taking supply at less than 1 kV and generally from the low voltage distribution transformer terminals. A NEM compliant Type 1-5 interval meter is required with the ability to measure both active and reactive power. The customer may elect to use the LV agreed demand tariff, the LV actual demand tariff or, if SA Power networks has assigned the customer to it, the LV transition actual demand tariff. These tariffs are typically invoiced monthly and agreed demand is levied on a per day basis. Customers with Type 5 meters using the actual demand tariff options may elect to use quarterly billing. Customers should note that where they choose to have a Type 1-4 meter, they have the right to exercise choice regarding their metering service provider. There is also an option for the actual demand to be levied on a ‘per day’ basis rather than a ‘per month’ basis, but the actual demand is always measured as the maximum since the previous meter reading (for Type 1-4 meters, a calendar month read is assumed). Note that this is also an optional tariff for small customers not covered by 2 (a)-(d) above. An optional small customer may elect to switch to another tariff after 12 months on this tariff.

(m) A Low Voltage Sports Ground (kVA) Agreed Demand customer is a Distribution Network User generally taking supply generally at less than 1 kV with a kVA demand and generally from the low voltage distribution transformer terminals that utilizes a significant quantity of sportground floodlighting. The time periods when the demand is measured are set out in 4 (c) below. A NEM compliant Type 1-5 interval meter is required with the ability to measure both active and reactive power. Customers should note that where they choose to have a Type
1-4 meter, they have the right to exercise choice regarding their metering service provider. The customer may also elect to use one of the tariff options available under 2 (l), (n) and (o). These tariffs are invoiced monthly and agreed demand is levied on a per day basis.

(n) A Low Voltage Business (kVA) monthly demand customer is a Distribution Network User that is a business customer generally taking supply at less than 1 kV. Consumption is charged at a flat rate. A charge also applies for the maximum demand each month with different prices applying in the peak period (summer months November to March between 1600 and 2100 workdays local SA time) and the shoulder period (all months July to June between 1200 and 1600 workdays local SA time), as detailed in the Tariff Schedule. The User utilises a Type 1-5 NEM compliant meter read monthly. Customers with Type 5 meters using the actual demand tariff options may elect to use quarterly billing. Customers should note that where they choose to have a Type 1-4 meter, they have the right to exercise choice regarding their metering service provider. The actual demand is levied on a ‘per day’ basis but the actual demand is measured as the maximum since the previous meter reading (for Type 1-4 meters, a calendar month read is assumed). This tariff is invoiced either monthly or quarterly. A customer may elect to switch to another tariff after 12 months on this tariff. A transition version of this tariff is available for business customers assigned to it during 2015/16.

(o) A Low Voltage Business (KW) monthly demand customer is a Distribution Network User that is a business customer generally taking supply at less than 1 kV. Consumption is charged at a flat rate. A charge also applies for the maximum demand each month with different prices applying in the peak summer months (November to March between 1200 and 2100 workdays SA local time) and the shoulder winter months (April to October between 1200 and 1600 workdays local SA time), as detailed in the Tariff Schedule. The User utilises a Type 1-5 NEM compliant meter read monthly. Customers with Type 5 meters using the actual demand tariff options may elect to use quarterly billing. Customers should note that where they choose to have a Type 1-4 meter, they have the right to exercise choice regarding their metering service provider. The actual demand is levied on a ‘per day’ basis but the actual demand is measured as the maximum since the previous meter reading (for Type 1-4 meters, a calendar month read is assumed). This tariff is invoiced either monthly or quarterly. A customer may elect to switch to another tariff after 12 months on this tariff. A transition version of this tariff is also available for small business customers assigned to it from July 2017.

(p) A Low Voltage Business 2 rate customer is a Distribution Network User that is not a residential customer generally taking supply at less than 1 kV and using peak and off-peak network charges. The User utilises a Type 1-6 NEM compliant meter. Where a Type 1-5 meter is utilised, the meter must have the ability to measure both active and reactive power. Peak consumption is charged at a flat rate as is Off Peak consumption. Customers should note that where they choose to have a Type 1-4 meter, they have the right to exercise choice regarding their metering service provider. This tariff is available only to Distribution Network Users that were taking supply under this tariff as at 30 June 2017 and where the customer’s supply arrangements have not altered. This tariff is not available to Distribution Network Users required to use a demand based tariff (see 2 (a) to 2 (g)) although a separate transition business 2-rate tariff is available for such customers but with Type 6 metering. This tariff is invoiced monthly or quarterly.

(q) A Low Voltage Business single rate customer is a Distribution Network User that is not a residential customer generally taking supply at less than 1 kV. Consumption is charged at two blocks of consumption and is detailed in the Tariff Schedule. The User utilises a Type 1-6 NEM compliant meter. Where a Type 1-5 meter is utilised, the meter must have the ability to measure both active and reactive power. Customers should note that where they choose to have a Type 1-4 meter, they have the right to exercise choice regarding their metering service provider. This tariff is available only to Distribution Network Users that were taking supply under this tariff as at 30 June 2010 and where the customer’s supply arrangements have not altered. This tariff is not available to Distribution Network Users required to use a demand based tariff (see 2 (a) to 2 (g)) although a separate transition business single-rate tariff is available for such customers but with Type 6 metering. This tariff is invoiced monthly or quarterly.

(r) A Low Voltage Residential single rate customer is a Distribution Network User that is a residential customer taking supply at less than 1 kV. Consumption is charged at two blocks of consumption and is detailed in the Tariff Schedule. The User utilises a Type 1-6 NEM compliant meter. Where a Type 1-5 meter is utilised, the meter must have the ability to measure both active and reactive power. Customers should note that where they choose to have a Type 1-4 meter, they have the right to exercise choice regarding their metering service
provider. This tariff is invoiced monthly or quarterly. This tariff is not available to Distribution Network Users required to use a demand based tariff (see 2 (a) to 2 (g)) although a separate transition residential single-rate tariff is available for such customers but with Type 6 metering. Subject to Judicial Review outcomes, there is also a separate tariff for those Residential customers that have Solar PV installed and for those Residential customers participating in the Social tariff program.

(s) A Low Voltage Residential monthly demand customer is a Distribution Network User that is a residential customer taking supply at less than 1 kV. Consumption is charged at a flat rate. A charge also applies for the maximum demand each month with different prices applying in the peak summer months (November to March) and the shoulder winter months (April to October), as detailed in the Tariff Schedule. The time period when the monthly peak demand is measured is between 1600 and 2100 local SA time. Note that demand is not measured on Christmas Day. The User utilises a Type 1-5 NEM compliant meter read monthly. Customers with Type 5 meters using the actual demand tariff options may elect to use quarterly billing. Customers should note that where they choose to have a Type 1-4 meter, they have the right to exercise choice regarding their metering service provider. The actual demand is levied on a ‘per day’ basis but the actual demand is measured as the maximum since the previous meter reading (for Type 1-4 meters, a calendar month read is assumed). Note that this is an optional tariff and is invoiced either monthly or quarterly. A customer may elect to switch to another tariff after 12 months on this tariff. A transition version of this tariff is also available for residential customers assigned to it from July 2017. A Solar Sponge version of this tariff is also available and includes time-of-use options, with off-peak usage defined as all days 1000-1500 Central Standard Time and peak usage defined as all days 1500-2000 Central Standard Time.

(t) A Low Voltage Controlled Load is used by a Distribution Network User for permanently installed storage water heaters with a rated delivery of not less than 125 litres, storage space heaters and other approved applications involving a time switch and separate metering where the timing has been set in accordance with SA Power Networks’ requirements regarding the timing of loads. Consumption is charged at a flat rate. This tariff is available only to Distribution Network Users that were taking supply under the Controlled Load tariff as at 30 June 2003, or are utilising a business single or residential tariff at the NMI in conjunction with the controlled load. This tariff is invoiced at the same frequency as other tariffs used by the Distribution Network User at that NMI. Customers may apply to SA Power Networks and pay a fee to have the time switches amended to include use under this tariff during 1000 and 1500 Central Standard Time.

(u) Unmetered Overnight Usage supply is defined as overnight use by a Distribution Network User for public lighting. These tariffs are generally invoiced monthly, unless otherwise agreed by SA Power Networks.

(v) Unmetered 24 Hour Usage supply is defined as constant 24 hour per day use by a Distribution Network User, typically public phones, traffic lights and telecommunications installations. These tariffs are generally invoiced monthly, unless otherwise agreed by SA Power Networks.

3. The supply and demand charges are levied and billed to Distribution Network Users periodically on a pro-rata basis.

4. Agreed Demand charges for business customers are determined on the basis of the maximum half-hour trading interval for::
   a. Agreed Maximum Demand (Annual Peak Demand) on workdays between 1200 and 2100 CDST during November to March only;
   b. Agreed additional maximum demand (Additional Demand), as the difference between the customer’s anytime maximum demand and the agreed maximum demand;
   c. For business customers on the Sports Ground demand kVA tariff, the Agreed Peak Demand shall be determined between 1200 and 1900 CDST during December to February only. Additional Demand shall be determined using all other times of the year.
5. Actual kVA Demand charges for business customers are determined on the basis of the maximum half-hour trading interval since the last meter read (Type 1-4 meters are assumed to be read each calendar month) for:
   a. Summer Peak Demand on work days between 1600 and 2100 CDST during November to March only;
   b. Year-round Shoulder Demand on work days between 1200 and 1600 CST or (when operating) CDST;
   c. Off-peak Demand at all other times (the price is zero for actual off-peak demand).

5. Actual kW Demand charges for business customers are determined on the basis of the maximum half-hour trading interval since the last meter read (Type 1-4 meters are assumed to be read each calendar month) for:
   a. Summer Peak Demand on work days between 1200 and 2100 CDST during November to March only;
   b. Winter Shoulder Demand on work days between 1200 and 1600 CST or (when operating) CDST;
   c. Off-peak Demand at all other times (the price is zero for actual off-peak demand).

6. Actual kW Demand charges for residential customers are determined on the basis of the maximum half-hour trading interval since the last meter read (Type 1-4 meters are assumed to be read each calendar month) for:
   a. Summer Peak Demand on all days between 1600 and 2100 CDST during November to March only;
   b. Winter Shoulder Demand on all days between 1600 and 2100 CST or (when operating) CDST;
   c. Off-peak Demand at all other times (the price is zero for actual off-peak demand).

6. Peak energy for the Business 2-rate tariff is energy consumed on business days between the hours of 0700 and 2100 Central Standard Time. Type 6 meters typically measure this for week days whereas Type 1-5 meters will measure this in on work days. For Distribution Network Users with Type 6 metering that does not recognize specific days, peak energy is energy consumed on each day between the hour of 0700 and 2100 (Central Standard Time).

7. Peak energy for the Residential kW Actual Demand Solar Sponge tariff is energy consumed on all days between the hours of 1500 and 1500 Central Standard Time. It excludes the off-peak period between 1000 and 1500 Central Standard Time on all days.

8. Off-peak energy is energy consumed other than peak energy.

9. For monthly energy blocks still in use in 2015/16,
   (a) 333.3 kWh/mth approximates 4,000 kWh per annum (residential tariffs); and
   (b) 833.3 kWh/mth approximates 10,000 kWh per annum (business single-rate tariffs). Note that this block is effectively redundant from July 2017.
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SA Power Networks

1. Introduction

This Appendix to SA Power Networks’ 2017-20 Tariff Structure statement (TSS) sets out the methodology which SA Power Networks has developed to determine the Long Run Marginal Cost (LRMC) of supply for its standard control services tariff classes. This method was established for 2010/11 and has had minor updates since then.

This LRMC is to be used by SA Power Networks in setting the charging parameters of its distribution tariffs, in accordance with the provisions of clause 6.18.5(f) of the Rules (version 75).

The consideration of LRMC applies where price signalling charging parameters (e.g., demand related components) form part of a tariff. SA Power Networks has aimed to ensure that where such price signals are introduced or varied, they are moved in such a direction as to improve alignment with the LRMC. Charging components that materially over-recover or under-recover the LRMC would not pass on an efficient pricing signal to customers that represents their cost of utilising the network.

The new Rule change explicitly requires us to base our tariffs on such costs, with the balance of other efficient costs for that tariff recovered in a way that minimises distortions to the efficient usage price signals. We utilise a fixed daily charge and energy-based charges. This is in accordance with the requirement in clause 6.18.5(g) of the Rules (version 75).

2. Approach used to calculate LRMC

In the context of an infrastructure business with asset lives of typically 40 years, short run costs are effectively zero, up to the point where the capacity of the network is exceeded. It is therefore important to use the LRMC in any consideration of the marginal cost of providing network service. In this context, the long run refers to a situation in which the investment in plant and equipment is variable.

There are three general approaches to the calculation of LRMC. Marsden Jacob Associates articulated these alternatives, in its review of possible approaches for the Queensland Competition Authority. This review was undertaken in the context of determining efficient prices for the Gladstone Area Water Board. The alternatives are as follows:

- **Marginal Incremental Cost** (MIC) - where a scenario involving increased demand is tested for its incremental effect on capex. The associated marginal cost is calculated as the difference between the present value of the investment programs divided by the increment in demand;

- **Average Incremental Cost** (AIC) - is the present value of the incremental investment associated with increasing demand divided by the present value of the increment in demand; and

- **Long Run Incremental Cost** (LRIC) - is the annuitised value of the capital expenditure divided by the increment in demand.

---

1 Marsden Jacob Associates, Estimation of Long Run Marginal Cost (LRMC) - A report prepared by the Queensland Competition Authority - Final, 3 November 2004
In comparing the suitability of these three approaches, the first requires scenario definition and analysis, which although not impracticable would be very resource intensive in the context of SA Power Networks’ distribution business. Marsden Jacob make the point that because the AIC approach is based on a long term planning period, it takes a longer view of costs and provides more stable prices than the LRIC approach\(^2\).

The approach used by SA Power Networks in this TSS to determine the LRMC of its tariff classes may be characterised as the AIC. However, the calculation has been extended to incorporate the incremental operating cost associated with new capital investment. This is the same as the approach taken by EnergyAustralia in its 2009 Pricing Proposal\(^3\).

The AIC may be expressed algebraically as follows:

\[
LRMC(AIC) = \frac{PV(\text{growth related capex}) + PV(\text{growth related opex})}{PV(\text{incremental demand})}
\]

Where:

- **growth related capex** is the annualised capital expenditure to meet the additional demand and new customer connections forecast over the forecast period;
- **growth related opex** is the incremental annual cost of operating and maintaining the newly constructed network and connection assets over the forecast period; and
- **incremental demand** is the forecast change in kVA demand compared with the base year.

The network is augmented to provide additional capacity for the connection of additional demand. Since the network capacity to supply demand is measured in units of kVA, the LRMC is calculated as the annualised cost per unit of additional network kVA capacity, in $/kVA per annum.

### 3. Process employed

For the purpose of complying with the Rules, the LRMC calculation is required for each of SA Power Networks’ five tariff classes:

- Major business;
- High Voltage business;
- Distribution Transformer business;
- Low Voltage business; and
- Low Voltage Residential.

As these tariff classes involve customers connected at different levels of the network, the calculations of LRMC must be carried out for the following levels of the network:

- Subtransmission;

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\(^2\) Marsden Jacob, LRMC, November 2004, p.16.

SA Power Networks

- Zone Substation;
- High voltage;
- Distribution Transformer; and
- Low voltage.

The process employed by SA Power Networks in the calculation of the network LRMC for its tariff classes is illustrated in the flow diagram in Figure 1.

![Flow Diagram](image)

**Figure 1 - Approach used to calculate LRMC for tariff classes**

The left hand side of Figure 1 shows the basic forecast inputs to the calculation: capex; opex; and demand. The right hand block depicts the process by which the LRMC (AIC) is determined for the levels of the network and tariff classes.

### 4. Capex and opex forecasts

The capex and opex forecasts used to determine the LRMC should ideally be for a period commensurate with the life of the assets employed. This clearly is not practicable for assets with service lives of 30 to 40 years, but the forecast should extend as far into the future as possible.

A forecast period of 10 years (to 2020) was used by SA Power Networks, since this forecast was prepared in the course of developing estimates for the regulatory proposal to the AER in 2010. We will review the LRMC methodology and calculations as part of the Tariff Structure Statement Revised Proposal later in 2016 Quarter 3, incorporating the recently determined AER efficient opex and capex expenditures. For the purpose of this TSS, we have utilised the 2010 LRMC calculation, updated for the change in Vanilla WACC determined by the AER in the 2015-20 Decision and to include the Distribution Transformer Tariff Class.
Note that the opex expenditures, the capex expenditures and the demand forecasts used in calculating the LRMC have come from the same analysis. However, we have updated the cost of capital, and we have scaled the findings to 2017/18 efficient costs (ie $775M, as determined by the AER). This was a long-run calculation which should still have applicability today.
SA Power Networks

Capital expenditure forecast

A summary of the growth related capital expenditure forecast used by SA Power Networks for the LRMC calculation is shown in Table 1.

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Table 1 - Growth related capital expenditure forecast ($'000 real 2010-11)

The capital expenditure forecast for the 2010-15 regulatory control period is that accepted by the AER in its Decision for the 2010-15 regulatory control period. The forecast from 2015-20 was estimated by SA Power Networks’ planners at that time in the course of developing longer term strategic options for the development of the network.

This capital expenditure forecast includes two components of the costs submitted to the AER: in respect of growth related augmentation of the network; and SA Power Networks’ component of costs associated with new customer connections (net of capital contributions).
Operating expenditure forecast

The corresponding incremental operating expenditure, associated with operating and maintaining the new augmentation and connection assets, is shown in Table 2.

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<tr>
<td>Distribution substations</td>
<td>1,379</td>
<td>810</td>
<td>351</td>
<td>353</td>
<td>445</td>
<td>442</td>
<td>512</td>
<td>523</td>
<td>535</td>
<td>550</td>
<td>568</td>
</tr>
<tr>
<td>LV network</td>
<td>574</td>
<td>299</td>
<td>124</td>
<td>128</td>
<td>156</td>
<td>158</td>
<td>181</td>
<td>184</td>
<td>187</td>
<td>191</td>
<td>196</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>3,387</td>
<td>4,150</td>
<td>2,199</td>
<td>1,727</td>
<td>2,025</td>
<td>1,929</td>
<td>2,307</td>
<td>2,525</td>
<td>2,113</td>
<td>2,773</td>
<td>3,073</td>
</tr>
</tbody>
</table>

Table 2 - Growth related operating expenditure forecast ($'000 real 2010-11)^5

The operating expenditure forecast for 2010-15 is that accepted by the AER in its Decision for the 2010-15 regulatory control period. The forecast from 2015-20 was estimated as an average proportion of the value of the capital costs in this period, from the capital expenditure forecast in Table 1.

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^5 This operating expenditure forecast includes only the components of cost associated with growth in operating expenditure due to increases in the size of the network, number of customers, number of employees and amount of work being undertaken on the network (ie expenditure associated with SA Power Networks' 'scale' escalators).
Demand forecast

The demand forecast over the 10 year period is shown in Table 2. The forecast quantities are coincident with the peak demand on SA Power Networks’ network and have a 10% Probability of Exceedence (PoE). Forecasts with a 10% PoE are used in planning the capacity of the network to meet the expected demand. The LV Business demands from 2010 have been split between the Distribution Transformer Business and LV Business Tariff Classes.

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Major business</td>
<td>215</td>
<td>227</td>
<td>251</td>
<td>259</td>
<td>268</td>
<td>268</td>
<td>274</td>
<td>282</td>
<td>291</td>
<td>294</td>
<td>301</td>
</tr>
<tr>
<td>HV business</td>
<td>237</td>
<td>243</td>
<td>249</td>
<td>254</td>
<td>257</td>
<td>261</td>
<td>267</td>
<td>275</td>
<td>283</td>
<td>287</td>
<td>293</td>
</tr>
<tr>
<td>DTF business</td>
<td>686</td>
<td>704</td>
<td>722</td>
<td>736</td>
<td>744</td>
<td>756</td>
<td>775</td>
<td>797</td>
<td>821</td>
<td>831</td>
<td>850</td>
</tr>
<tr>
<td>LV business</td>
<td>696</td>
<td>715</td>
<td>733</td>
<td>748</td>
<td>755</td>
<td>768</td>
<td>787</td>
<td>809</td>
<td>833</td>
<td>844</td>
<td>863</td>
</tr>
<tr>
<td>LV residential</td>
<td>1,525</td>
<td>1,589</td>
<td>1,650</td>
<td>1,702</td>
<td>1,729</td>
<td>1,774</td>
<td>1,842</td>
<td>1,923</td>
<td>2,009</td>
<td>2,049</td>
<td>2,127</td>
</tr>
</tbody>
</table>

Table 3 - Coincident demand forecast (MVA)

This forecast is consistent with the global MW demand forecast that the AER used for SA Power Networks’ Regulatory Decision in 2010. The forecast of coincident MVA contributions for tariff classes has required some additional estimation, includes adjustments for the measured power factor of customer loads at the time of coincident peak demand and has been adjusted to split LV Business into DTF business/LV business.

6 The demand forecasts in this table are of the coincident contribution of each tariff class to SA Power Networks’ overall peak demand, with a 10% PoE. These forecast tariff class demands differ from the individual peak demand of each tariff class.
5. LRMC outcomes

The outcome from applying the calculation process described in this document to SA Power Networks’ tariff classes is shown in Table 4. The LRMC outcome has been updated for 2017-20, by indexation with the cumulative CPI of 1.2131 since 2009/10. The update also includes the effect of Vanilla WACC reducing to 6.17%.

<table>
<thead>
<tr>
<th>Tariff class</th>
<th>LRMC, $/kVA per annum $2009/10</th>
<th>LRMC, $/kVA per annum $2017/18</th>
</tr>
</thead>
<tbody>
<tr>
<td>Major business</td>
<td>$29</td>
<td>$35</td>
</tr>
<tr>
<td>HV business</td>
<td>$66</td>
<td>$80</td>
</tr>
<tr>
<td>DTF business</td>
<td>$89</td>
<td>$108</td>
</tr>
<tr>
<td>LV business</td>
<td>$98</td>
<td>$119</td>
</tr>
<tr>
<td>LV residential</td>
<td>$102</td>
<td>$124</td>
</tr>
</tbody>
</table>

Table 4 - Calculated LRMC for SA Power Networks' network ($2009/10)

These estimates have been used in this 2017-20 TSS.

To provide confidence in the reasonableness of these long-run estimates, we have compared these to recently prepared Victorian distributor LRMC estimates. The Victorian network is similarly privatised with similar contingency arrangements (unlike Queensland and NSW). The Victorian and SA networks also have similar weather (albeit slightly less extreme for Victorian summers) although Victoria has more customers per kilometre. Given that we are trying to prepare an LRMC for use with state-wide pricing that reflects costs for the majority of customers, checking against LRMC prices with a network similar to ours but with less of the long rural lines provides a useful price.

The chart below compares SA Power Networks’ estimate of LRMC with the average of the Victorian distributors and each distributor. Some assumptions have been made to enable this comparison.
The chart implies that the LRMC prices are reasonable. We will review these prices in the Revised TSS in Quarter Three 2016.
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1. Introduction

This Appendix to SA Power Networks’ 2017-20 Tariff Structure Statement (TSS) sets out the methodology that SA Power Networks has developed to determine the Stand-alone cost and the Avoidable cost of supply, for its standard control services tariff classes. This methodology was established in 2010/11.

These costs are used by SA Power Networks in establishing the prices for standard control services, as clause 6.18.5(c) of the Rules (version 75) requires SA Power Networks to ensure that the revenue recovered for each tariff class lies between:

- An upper bound, representing the stand-alone cost of serving the customers who belong to that class; and
- A lower bound, representing the avoidable cost of not serving those customers.

The Stand-alone and Avoidable cost methodologies in this Appendix are used to calculate the revenues for each standard control services tariff class associated with each cost. These costs are compared with the tariff class revenue derived from SA Power Networks’ proposed tariffs.

2. Definition of Stand-alone and Avoidable costs

These two categories of cost may be defined for tariff classes, as follows:

- The **Stand-alone cost** for a tariff class is the cost of supplying only the tariff class concerned, with all other tariff classes not being supplied. If customers were to pay above the stand-alone cost, then it would be economically beneficial for customers to switch to an alternative provider. It would also be economically feasible for an alternative service provider to operate. This creates the possibility of inefficient bypass of the existing infrastructure; and

- The **Avoidable cost** for a tariff class is the reduction in network cost that would eventuate if the tariff class were not supplied (whilst all other tariff classes remained supplied). If customers were to be charged below the Avoidable cost, it would be economically beneficial for the business to stop supplying the customers as the associated costs would exceed the revenue obtained from the customer.

There are two alternative concepts that could be used to calculate these costs:

- To ignore the sunk nature of the existing network and estimate the costs which would be associated with an optimally designed network, constructed to supply standard control services to the tariff class or classes concerned; or

- To base the estimation of costs on the modification of the existing network to provide standard control services to the tariff class or classes concerned.

The Rules do not prescribe the methodology that should be used to calculate the Stand-alone and Avoidable costs of tariff classes of the network. SA Power Networks has chosen to base its cost
estimations on the second concept, based on the hypothetical modification of the existing network, rather than by devising and costing optimal new network structures. This has been done for two reasons:

- To avoid the very substantial resource requirements that would be involved in a full network redesign; and
- In recognition that the economic regulatory framework for distribution supports the existence and value of existing (sunk) network investments and does not support the optimisation of existing networks.

SA Power Networks’ approach is thus conceptually the same as that which was employed by Integral Energy in its 2009 Pricing Proposal, and subsequently approved by the AER\(^1\).

3. Process employed

The derivation of the Stand-alone and Avoidable cost for tariff classes uses a methodology derived from SA Power Networks’ cost of supply model. The cost of supply model has been in use for a decade and was formulated to permit the efficient allocation of network costs to tariff classes and the formulation of network prices.

SA Power Networks’ cost of supply model

In common with other network service providers, SA Power Networks employs a three-step process for the formulation of its distribution prices. The three steps are as follows:

1. Determination of the efficient revenue requirement (by the AER), which the tariffs are set to recover;
2. Allocation of that revenue as a cost to network users by tariff class and also by tariff; and
3. Conversion of the allocated cost to tariff parameters to represent a variable price for the use of the network.

The building block network revenue is firstly allocated on the basis of the undepreciated value of the assets employed to each level of the network as follows:

- Subtransmission;
- Zone substations;
- High Voltage Distribution;
- Distribution substations; and
- Low Voltage distribution network, including LV services.

Within the cost pools, the allocation of costs between tariff classes is on the basis of their relative contribution to peak demand (50% of allocation) and their energy consumption (50% of allocation). The exception to this is LV services which are allocated on a per customer basis and the balance of the LV distribution network which has a third allocation on a per customer basis, reflecting the need

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for more LV network in residential areas because of the house frontage. The demand-based 50% of allocation has been used because it mimics the outcome of allocating LRMC-based costs to users, which is then used in pricing. The other energy-based 50% allocation is used as a non-distortionary way of allocating efficient costs but in a way that does not distort the efficient price signalling of the LRMC signal. Note that this method ensures that each tariff class and each tariff have had costs allocated to them which reflect the total efficient costs of serving the customers assigned to these tariff classes and these tariffs.

The cost of supply model provides an indication of the relative recovery of costs by distribution tariffs and the direction in which prices need to be trended to improve their cost reflectivity. The model also calculates the forecast revenue obtained through pricing, which is reconciled with the annual revenue requirement.

SA Power Networks’ approach to the allocation of costs to tariffs and tariff classes, derived from the cost of supply model for the purposes of this TSS, is illustrated in Figure 1. The percentages shown in this illustration are proportions of the annual revenue associated with elements of the supply system and with non-system-related-costs.

### Revenue Cost Allocation Model to Tariff Classes 2017/18

<table>
<thead>
<tr>
<th>Allocation Basis to Tariff Class</th>
<th>Tariff Class</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>major business</td>
</tr>
<tr>
<td>Number of Customers (NMI's)</td>
<td>20</td>
</tr>
<tr>
<td>Diversified Demand MVA</td>
<td>155</td>
</tr>
<tr>
<td>Usage GWh (at Pool Exit)</td>
<td>1,006</td>
</tr>
<tr>
<td>Transmission (ElectraNet) $308M</td>
<td></td>
</tr>
<tr>
<td>Distribution (SA Power Networks) $775M</td>
<td></td>
</tr>
<tr>
<td>PV FiT Recovery (SA Government Scheme) $90M</td>
<td></td>
</tr>
</tbody>
</table>

Figure 1 - Cost allocation approach
This revised cost allocation model has been used as the basis for SA Power Networks’ consideration of the Stand-alone and Avoidable costs of the five tariff classes. The model shows the five tariff classes, the three categories of charges and the voltage levels involved in each charge category. The basis for allocating voltage level charges to tariff classes is shown (e.g., demand, usage or customers/NMIs) and the raw quantities for each tariff class are also shown.

4. Stand-alone costs

The Stand-alone cost for each tariff class was derived from an engineering estimate of the proportions of the network capacity (and associated cost) that would need to remain in place to service the load. This estimate is made for each of the five tariff classes in turn. This calculation works best with significant tariff classes as the network that is avoidable or incremental for small tariff classes is even harder to identify.

In so doing, SA Power Networks’ network planners reassessed the required network capacity at each level of the network in response to the following hypothetical question:

"If XX tariff class were the only one supplied from the network, what percentage reduction in the cost of existing assets employed to service category YY could be made but still enable the same standard of network service to be provided to tariff class XX."

The process followed is illustrated in Figure 2, for the High Voltage Business tariff class.

<table>
<thead>
<tr>
<th>Cost Pool</th>
<th>Tariff Class</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Major Business</td>
</tr>
<tr>
<td>ST networks</td>
<td></td>
</tr>
<tr>
<td>Zone substations</td>
<td></td>
</tr>
<tr>
<td>HV network</td>
<td></td>
</tr>
<tr>
<td>Distribution substations</td>
<td></td>
</tr>
<tr>
<td>LV Network (including connection and metering)</td>
<td></td>
</tr>
<tr>
<td>Non system costs</td>
<td></td>
</tr>
</tbody>
</table>

Figure 2 - Stand-alone cost calculation: HV Business example

In Figure 2, the proportions of the subtransmission, zone substation and high voltage networks that would be required to service the High Voltage Business tariff class are shown.
SA Power Networks

The HV Business tariff class comprises some 6% of coincident demand of all tariff classes. However, as a tariff class standing alone, there would not be a commensurate reduction in the costs of each asset class. For example, because High Voltage customers are dispersed throughout SA Power Networks’ territory, the required proportion of the total subtransmission network (which services all tariff classes) is higher, at 36%.

Likewise, it is estimated that approximately 11% of the costs associated with zone substations would be required to service the High Voltage Business tariff class alone. For HV feeders, the proportion required of 7% is closer to that implied by the 6% of total coincident demand.

The resulting cost allocation for each tariff class was expressed in $/kVA, using the estimated coincident contribution to SA Power Networks’ peak system demand and after adjustment for the average power factor of the tariff class.

The process followed in relation to determining the stand-alone proportions for each system level cost category is set out in the following sub sections.

Subtransmission

A detailed review of the subtransmission lines that support supply to each of the customer tariff classes, either directly or through downstream infrastructure was made. The relative line lengths were then used to apportion the costs of this asset class.

Zone and small substations

Substations can be divided into two categories:

- Zone Substations (with installed capacity ≥ 10 MVA) and
- Small Substations (with installed capacity < 10 MVA).

SA Power Networks’ network contains approximately 161 Zone Substations and 240 Small Substations comprising 4,451 MVA of installed transformer capacity.

The standalone costs of customer tariff classes were estimated as a proportion of the total installed transformer capacity utilised by the tariff class, with allowance for dedicated substations at eight major business customer sites.

High Voltage network

The relative line lengths were also used to apportion the costs of this asset class.

The proportion of the High Voltage network utilised by major customers is 3%, involving a number of short dedicated feeders. For the High Voltage Business class in Figure 2, this proportion is 7%.

The remainder of this network is used by the High Voltage and Distribution Transformer business tariff class customers and the Low Voltage tariff classes (business and residential). The Stand-alone
costs for each of these tariff classes were estimated from the typical configuration of supply from the High Voltage network in metropolitan and rural areas.

**Distribution transformers**

The Major Business and High Voltage Business tariff classes do not use this distribution infrastructure.

SA Power Networks has an extensive rural network, and as a consequence 75% of its distribution transformers supply a single customer. The stand-alone costs of these assets were allocated directly to the Low Voltage Business and Residential customer tariff classes concerned. The remaining shared distribution substations were allocated to these tariff classes after allowance for their respective capacity shares.

**Low Voltage network and services**

The Major Business, High Voltage Business and Distribution Transformer Business tariff classes do not use this distribution infrastructure.

The Stand-alone costs for each of the Low Voltage tariff classes were estimated from the typical configuration of supply from the Low Voltage network in metropolitan and rural areas. Consideration was given to proportioning the costs of the network in mixed supply areas, taking into account the use of assets in both normal and outage conditions.

**Non system costs**

Non system costs were considered in the following categories:

- Invariant, where the cost is not expected change in the event that only one tariff class was retained;
- Customer related, where the costs vary (although not proportionately) with the number of customers in the stand-alone tariff class; and
- IT related, where the costs also would vary (although not proportionately) with the number of customers in the stand-alone tariff class.

**Summary of Stand-alone costs**

The Stand-alone costs of SA Power Networks’ five tariff classes, estimated from existing system costs using the approach above are set out in Table 1.

The percentage figures represent the stand-alone proportion of the total annual costs (cost pool), associated with each level of the network resulting from the above adjustments for equipment numbers and capacity. The percentages, when applied to the cost pool, result in the costs shown and have been updated as proportions of the forecast 2017/18 distribution revenue of $775 million.
5. Avoidable costs

In similar manner to the Stand-alone cost, an engineering estimate was made of the proportions of the network capacity (and associated cost) that could be avoided, in the event that each of the five tariff classes were to be removed in turn.

This time, SA Power Networks’ network planners assessed the required network capacity at each level of the network, in response to the following hypothetical question:

“If XX tariff class were no longer supplied from the network, what percentage reduction in the cost of existing assets employed to service category YY could be made but still enable the same standard of network service to be provided to all remaining tariff classes.”

The process followed to develop estimates of the Avoidable cost is illustrated in Figure 3, again for the High Voltage Business tariff class.

![Figure 3 - Avoidable cost calculation: HV Business example](image-url)
SA Power Networks

Figure 3 displays the remaining costs at different levels of the network to service the remaining tariff classes. For instance, it is estimated that a reduction of approximately 4% of the costs associated with zone substations would be possible if the High Voltage Business tariff class was not supplied.

It should be noted that a hypothetical reduction in the coincident system demand of around 8% would occur if the HV Business tariff class were avoided. Again, this does not provide a commensurate reduction in the costs of each asset class. Because other customer classes are dispersed throughout SA Power Networks’ territory, no costs associated with the subtransmission network would be avoided.

As with the Stand-alone cost, the Avoidable network cost was expressed in $/kVA for each tariff class.

The process followed in relation to determining the avoidable proportions for each system level cost category is set out in the following sub sections.

**Subtransmission**

A detailed review of the subtransmission lines that support supply to each of the customer tariff classes, either directly or through downstream infrastructure, was made. The relative line lengths were then used to apportion the costs of this asset class on the assumption that the customers in each tariff class in turn were not supplied from the network.

**Zone and small substations**

The Avoidable costs of customer tariff classes were estimated as a reduction in the total installed transformer capacity utilised by the tariff class, again with allowance for dedicated substations at eight Major Business customer sites.

**High Voltage network**

The relative line lengths were also used to apportion the costs of this asset class.

As the proportion of the High Voltage network utilised by major customers is less than 1%, involving a number of short dedicated feeders, the removal of this tariff class would have negligible cost impact.

The remainder of this network is used by the High Voltage and Distribution Transformer Business tariff class customers and the Low Voltage tariff classes (Business and Residential). The Avoidable costs for each of these tariff classes were again estimated from the typical configuration of supply from the High Voltage network in metropolitan and rural areas, as the proportion of network that could be removed whilst still providing supply to the remaining tariff classes.
Distribution transformers

The Major Business and High Voltage Business tariff classes do not use this distribution infrastructure.

The Avoidable costs associated with single customer distribution transformers could readily be estimated directly for the Distribution Transformer Business, Low Voltage Business and Residential tariff classes. The same approach could be followed for the proportion of substations supplying only one of these tariff classes. For shared distribution transformers, the respective capacity shares of the tariff classes were used.

Low Voltage network and services

The Major Business, High Voltage Business and Distribution Transformer Business tariff classes do not use this distribution infrastructure.

The Avoidable costs for each of the two Low Voltage tariff classes were estimated from the typical configuration of supply from the Low Voltage network in metropolitan and rural areas. In mixed supply areas no reduction in the network was appropriate.

Summary of Avoidable costs

The Avoidable costs of SA Power Networks’ five tariff classes, estimated from existing system costs using the approach above are set out both as proportions of the cost pool and in dollar terms in Table 2. As the costs represent reductions, they are negative in sign. The percentage figures represent the avoidable proportion of the total annual costs (cost pool), associated with each level of the network, resulting from the above adjustments to the required equipment and capacity requirements. The percentages, when applied to the cost pool, result in the avoidable costs shown. As with Table 1, the costs have been updated to the forecast 2017/18 revenue of $775 million.

Table 2 - Avoidable costs of tariff classes ($million p.a.)

<table>
<thead>
<tr>
<th>Network level</th>
<th>Cost Pool</th>
<th>Tariff class</th>
<th>Major business</th>
<th>HV business</th>
<th>DTF Business</th>
<th>LV business</th>
<th>LV residential</th>
</tr>
</thead>
<tbody>
<tr>
<td>Subtransmission</td>
<td>56</td>
<td>-1%</td>
<td>-1%</td>
<td>0%</td>
<td>-3%</td>
<td>-1%</td>
<td>-3%</td>
</tr>
<tr>
<td>Zone/small substations</td>
<td>103</td>
<td>-4%</td>
<td>-4%</td>
<td>-4%</td>
<td>-4%</td>
<td>-4%</td>
<td>-4%</td>
</tr>
<tr>
<td>HV network</td>
<td>189</td>
<td>0%</td>
<td>0%</td>
<td>0%</td>
<td>-8%</td>
<td>-8%</td>
<td>-2%</td>
</tr>
<tr>
<td>Distribution substations</td>
<td>97</td>
<td>0%</td>
<td>0%</td>
<td>0%</td>
<td>-2%</td>
<td>-2%</td>
<td>-2%</td>
</tr>
<tr>
<td>LV network and services</td>
<td>214</td>
<td>0%</td>
<td>0%</td>
<td>0%</td>
<td>-10%</td>
<td>-21%</td>
<td>-68%</td>
</tr>
<tr>
<td>Non system costs</td>
<td>116</td>
<td>0%</td>
<td>0%</td>
<td>0%</td>
<td>-2%</td>
<td>-2%</td>
<td>-2%</td>
</tr>
<tr>
<td>Total</td>
<td>775</td>
<td>-5%</td>
<td>-4%</td>
<td>-37%</td>
<td>-57%</td>
<td>-869</td>
<td></td>
</tr>
</tbody>
</table>

Table 2 - Avoidable costs of tariff classes ($million pa, 2017/18)
6. Compliance with Rules clause 6.18.5(e)

In Table 3, the revenue expected to be recovered from each of SA Power Networks’ tariff classes in 2017/18 is compared with the Stand-alone and Avoidable costs calculated in Sections 4 and 5.

<table>
<thead>
<tr>
<th>Tariff class</th>
<th>Stand-alone cost</th>
<th>Tariff revenue</th>
<th>Avoidable cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Major business</td>
<td>$96</td>
<td>$8</td>
<td>$5</td>
</tr>
<tr>
<td>HV business</td>
<td>$108</td>
<td>$33</td>
<td>$4</td>
</tr>
<tr>
<td>DTF business</td>
<td>$257</td>
<td>$146</td>
<td>$37</td>
</tr>
<tr>
<td>LV business</td>
<td>$326</td>
<td>$177</td>
<td>$57</td>
</tr>
<tr>
<td>LV residential</td>
<td>$677</td>
<td>$409</td>
<td>$269</td>
</tr>
</tbody>
</table>

Table 3 - Stand-alone and avoidable distribution network costs ($M, 2017/18)

SA Power Networks’ 2017/18 network tariff classes lie within the subsidy free range, in that the expected DUoS revenue collected from the tariff class lies between the Avoidable and Stand alone costs of supply and therefore meet the requirements of section 6.18.5(e) of the Rules (version 75).
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Introduction

This Appendix is based on extracts from the SA Power Networks *Network Tariff & Negotiated Services Manual No. 18*. This is updated each year and submitted with the Annual Pricing Proposal. The current tariff year’s version is available from the SA Power Networks website ([www.sapowernetworks.com.au](http://www.sapowernetworks.com.au)).
SA Power Networks

A. Part A

Section 3 and Section 4 of the SA Power Networks Network Tariff & Negotiated Services Manual No. 18:

3. Tariff Class Assignment Procedures

This section sets out the tariff and tariff class assignment procedures to be followed by SA Power Networks in preparing pricing proposals for 2017/18 through to 2019/20.

3.1 Tariffs and Tariff Classes

SA Power Networks’ regulated services are classified in accordance with the Rules as direct control services and include its network services and some metering services. These services have been further divided into:

- Standard control services (network services); and
- Alternative control services (certain specified metering services).

Each of these classifications of service is subject to separate regulatory determinations by the AER.

SA Power Networks’ standard control services tariffs have been grouped into five tariff classes. This grouping is shown below illustrating the principal tariffs.
Table 1 - SA Power Networks’ standard control services tariff classes

SA Power Networks’ alternative control services tariff classes, tariffs and tariff parameters were determined by the AER in their Final Decision for the 2015/16-2019/20 Determination. The annual charges have all been grouped into three tariff classes with two tariffs in each class. Note that many customers will use both of these tariffs – the non-capital and the capital tariffs. This arrangement is illustrated below.

<table>
<thead>
<tr>
<th>Tariff Class</th>
<th>Tariff</th>
</tr>
</thead>
<tbody>
<tr>
<td>Type 1-4 ‘Exceptional’ remotely read interval meter</td>
<td>Type 1-4 Non-capital</td>
</tr>
<tr>
<td></td>
<td>Type 1-4 Capital</td>
</tr>
<tr>
<td>Type 5-6 CT connected manually read meter</td>
<td>Type 5-6 CT Non-capital</td>
</tr>
<tr>
<td></td>
<td>Type 5-6 CT Capital</td>
</tr>
<tr>
<td>Type 5-6 WC manually read meter</td>
<td>Type 5-6 WC Non-capital</td>
</tr>
<tr>
<td></td>
<td>Type 5-6 WC Capital</td>
</tr>
</tbody>
</table>

Table 2 - SA Power Networks’ alternative control services tariff classes
3.2 Assignment of new customers to a tariff class

Upon receipt of an Application for Connection/Alteration and Removal of Supply (Form A) for the provision of a new or altered network connection, the SA Power Networks Project Officer responsible for managing the Application for Connection will determine the tariff and tariff class to be applied to the new or upgraded customer connection.

The tariff and tariff class to be assigned, or reassigned, to a customer will be chosen by the Project Officer in accordance with the requirements set out in Sections 4 and 5 of this Network Tariff & Negotiated Services manual. This tariff and tariff class assignment takes into account one or more of the following factors:

- Customers with similar connection and usage profiles are treated equally; and
- Customers that have micro-generation facilities are not treated less favourably than customers with similar load profiles without such facilities.

Customer notification of tariff class assignment

The Project Officer is responsible for notifying the retailer, customer or intending customer who lodged the Application to Connect, of the proposed network tariff and tariff class assignment. These details are to be provided together with SA Power Networks’ connection offer to the customer.

The connection offer will include the additional information set out in Section 3.4.

3.3 Reassignment of existing customers to another existing or a new tariff class during the next regulatory control period

SA Power Networks’ Major Customer & Metering Manager is required to carry out a bi-annual review of the consumption of customers. This review is intended to identify whether:

- An existing customer’s load or connection characteristics have changed, such that it is no longer appropriate for that customer to be assigned to the current tariff class; or
- A customer no longer has the same or materially similar load or connection characteristics as other customers in that tariff class.

In the event that this review identifies customers whose tariff class and/or tariff is no longer appropriate, then SA Power Networks’ Major Customer & Metering Manager may propose to reassign that customer to another tariff class and/or tariff.

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1 Form A is available at: www.sapowernetworks.com.au/centric/contractors_and_designers/contractor_forms_and_guides.jsp
2 In the event that a future regulatory obligation requires remotely-read interval metering or other similar metering technology to be installed at the customer’s premises, this procedure may be modified.
Customer notification of tariff class reassignment

The Major Customer & Metering Manager is responsible for using best endeavours in notifying any customers in writing of the proposed reassignment of their network tariff. If the identity of the customer is not known, then the customer’s retailer is to be notified instead.

The tariff reassignment advice will include the additional information set out in Section 3.4.

One month’s notice is to be provided to the customer or retailer of a proposed tariff class and/or tariff reassignment.

3.4 Objections to proposed tariff class and tariff assignments and reassignments

Information provided to customers concerning tariff class and tariff assignment and reassignment

Where SA Power Networks notifies customers of a tariff class and/or tariff assignment or reassignment in Sections 3.1 and 3.2 above, such notification will include reference to the web address from which this Network Tariff & Negotiated Services Manual may be obtained and also include the following advice that:

- The customer may request further information from SA Power Networks’ Regulatory Manager;
- The customer may object in writing to SA Power Networks’ Regulatory Manager concerning the proposed tariff or tariff class assignment;
- In the event that the customer is not satisfied with SA Power Networks’ internal resolution of such an objection, the customer may be entitled to appeal to the Energy Industry Ombudsman (South Australia). Typically small customers (<160 MWh) have access to the Ombudsman; and
- In the event that an objection is not resolved to the satisfaction of the customer under SA Power Networks internal review system, then the customer is entitled to seek resolution via the dispute resolution process available under Part 10 of the NEL.

Upon receipt of a request for further information concerning a tariff class assignment or reassignment, SA Power Networks’ Regulatory Manager is to arrange the provision of relevant information to the customer concerning the tariff class and/or tariff assignment or reassignment, provided that such information is not confidential.

Internal review process of tariff class and/or tariff assignment and reassignment

Upon receipt of an objection by a customer to a tariff class and/or tariff assignment or reassignment, SA Power Networks’ Regulatory Manager will reconsider the relevant tariff class/tariff assignment or reassignment, having regard to the following:

- The basis of the customer’s objection;
• The principles for tariff assignment and reassignment set out in clauses 6.18.3 and 6.18.4 of the Rules;
• The procedures for tariff assignment and reassignment set out in Attachment 14 of the AER’s Determination; and
• The process and guidelines for tariff assignment and reassignment set out in Sections 3 and 4 of this Network Tariff & Negotiated Services Manual.

The SA Power Networks Regulatory Manager will notify the customer of the outcome of SA Power Networks internal review and the reasons for accepting or rejecting the customer’s objection to the tariff class/tariff assignment or reassignment. The notification by the Regulatory Manager will also advise that:

• In the event that the customer is not satisfied with SA Power Networks’ internal resolution of such an objection, the customer may be entitled to appeal to the Energy Industry Ombudsman (South Australia); and
• In the event that an objection is not resolved to the satisfaction of the customer under the SA Power Networks internal review system, then the customer is entitled to seek resolution via the dispute resolution process available under Part 10 of the NEL.

External review of tariff class and/or tariff assignment and reassignment

If a customer’s objection to a tariff class assignment or reassignment is upheld by a relevant external dispute resolution body, then any adjustment which needs to be made to prices will be done by SA Power Networks as part of the next annual review of prices.
4. Tariffs

4.1 General

A customer’s retail electricity bill will generally comprise the following components, although particularly for smaller customers, these components may not be separately itemised:

- Retail charges;
- NEM charges;
- Network charges; and
- Metering charges.

Retail charges cover the cost of a retailer buying energy from the national pool or directly from a generator and selling it to the customer. The retail charge is the component that a customer negotiates a pricing plan for when entering into a market contract.

The components of a customer’s retail electricity bill are shown in the following illustration. With regard to metering services, certain components of the metering service may be provided by SA Power Networks, may be supplied by the retailer or may be procured directly by the customer. Note that the PV FiT Cost Recovery Tariff is also included in SA Power Networks’ Tariffs, along with the Distribution Use of System and the Transmission Cost Recovery Tariffs.

![Figure 1 - Components of a retail electricity bill](image-url)
Network Tariffs are set in accordance with the requirements of:

- The Electricity Act;
- The NER; and
- The AER’s Determination.

SA Power Networks is required to assign a network tariff and tariff class to each customer using the procedure set out in Attachment 14 of the AER’s determination. In practical terms, the following factors determine the nature and extent of the customer’s usage and the nature of the customer’s network connection:

- Type of use (i.e., residential or business);
- The connection point characteristics (e.g., low or high voltage);
- The maximum electrical demand (e.g., low voltage greater than 150 kVA);
- The annual usage; and
- Subject to the findings of the Federal Court, whether PV utilisation results in a different load profile.

Network tariffs include components for:

- Distribution (DUoS – Distribution Use of System);
- Transmission (TUoS – Transmission Use of System);
- PV FiT (photo-voltaic feed-in tariff recovery); and may also include
- A separate tariff for Alternative Control Services - Metering Services.

In some cases a network tariff is required to be assigned and in other cases the customer or retailer can elect a tariff subject to meeting eligibility criteria.

4.2 Categories

Tariffs are to be assigned subject to the requirements specified in the “Notes accompanying the Distribution Tariffs” as issued from time to time. Customers must advise SA Power Networks of their particular circumstances in order for the correct tariff(s) to be assigned (Distribution Code requirement). For situations not specifically covered, the following general principles apply.

4.2.1 Residential use

Residential use is electricity consumed by a Customer at a domestic dwelling and who lives in that dwelling. This may include consumption from an office located within the home so long as there is no more than one employee normally working within the dwelling. Note: For the purposes of this definition hired domestic help or carers are not to be considered employees.

Residential use can also include:

- Electricity used in outbuildings etc located on the same property as the Customers’ dwelling and where the primary use of the outbuilding is domestic;
• Short term accommodation provided due to the nature and location of the property eg shearing quarters (accommodation provided as term of employment); and
• Electricity used in the pumping of water for domestic use (or effluent) for a single premises of the same Customer and on the same property (or multiple premises where eligible for residential tariff – as above).

Residential use does not include:

• Boarding houses, nursing homes or accommodation of motel or bed and breakfast type ie short term accommodation or where a fee is charged for the use of facilities;
• A clearly public office or shop attached to a dwelling;
• Temporary supplies; or
• One metered connection for three or more independent (or semi independent) dwelling(s).

4.2.2 Business use

Business use is electricity used for any purpose other than residential. This includes industrial, commercial, accommodation, hospitality and agricultural uses.

4.2.3 Combined Business/Residential use

The customer is responsible for ensuring that facilities are provided for metering the use of electricity for each purpose. Where such facilities are impractical or not provided the distribution tariff can be assigned on the basis of majority use.

Where it is known that a connection to a dwelling is subject to dual business/residential usage (and separate metering can not be installed) then, in the absence of any detailed information, the category should be determined by the majority floor space usage of the building for which the electricity supply is provided.

4.2.4 Controlled Load

Controlled load tariff is permitted to be used in conjunction with another tariff for specific thermal storage applications. Controlled Load tariff is available for new or existing supplies in conjunction with Residential Single Rate tariff only. Where an existing supply has some other tariff in conjunction with Controlled Load then the combination may remain as is however, if the customer seeks to change tariff (eg from BSROPcl to BD) then they can no longer retain the OPCL component.

OPCL tariff is available for approved applications via a time switch controlled by SA Power Networks. The timing of night time availability is set in accordance with SA Power Networks requirements. A residential customer may request additional time between 1000 and 1500 CST for use of OPCL by application. There is a fee for the amendment of the time clock to enable
the use of OPCL at these additional times. Existing OPCL installations with afternoon boost are maintained with no change to their timing.

Where dual element system has switched OPCL supply for the bottom element and continuous OPCL supply for the top element then that arrangement can be retained as is. For new or additional OPCL installations continuous supply on OPCL tariff is no longer available only switched supply. The switched supply now has access during 1000-1500 CST.

Approved applications of OPCL are permanently installed storage water heaters with a capacity of 125 litres or more, underfloor (slab heating), swimming pool or spa heating. For swimming pool or spa applications only the heating element is permitted to be connected to OPCL, pumps and auxiliaries are to be on the accompanying tariff.

4.3 Network Tariffs

The network tariff is independent of any retail pricing plan, contract or tariff. There are a few core tariffs in each group with minor variants.

The variants allow for:

- Optional metering needs (eg Type 1-5);
- Monthly/quarterly readings; and
- Combination with controlled load tariff.

The current tariffs and eligibility criteria are listed on the SA Power Networks internet and intranet sites.
<table>
<thead>
<tr>
<th>National Electricity Rules (v75 at time of preparation)</th>
<th>Cross reference to other rule(s)</th>
<th>Cross reference to TSS</th>
<th>SA Power Networks' response</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>6.8.2 Submission of regulatory proposal and tariff structure statement</strong></td>
<td></td>
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<tr>
<td>(c) A regulatory proposal must include (but need not be limited to) the following elements:</td>
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<tr>
<td>(7) a description (with supporting materials) of how the proposed tariff structure statement complies with the pricing principles for direct control services including:</td>
<td>6.18.5</td>
<td>Section 7</td>
<td>Refer to the TSS, Section 7 for a detailed response. The tariff reform Overview Paper summarises our consideration of Customer Impact Principles as well as the Pricing Principles.</td>
</tr>
<tr>
<td>(i) a description of where there has been any departure from the pricing principles set out in paragraphs 6.18.5(e) to (g); and</td>
<td></td>
<td></td>
<td>Departure only in accordance with transition provisions of 6.18.5 (h). The tariff reform Overview Paper summarises our trade-offs between purely cost-reflective pricing and customer impacts.</td>
</tr>
<tr>
<td>(ii) an explanation of how that departure complies with clause 6.18.5(c).</td>
<td>6.18.5(c)</td>
<td></td>
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</tr>
<tr>
<td>(c1) The regulatory proposal must be accompanied by an overview paper which includes each of the following matters ... a summary of the regulatory proposal the purpose of which is to explain the regulatory proposal in reasonably plain language to electricity consumers</td>
<td>Overview Paper</td>
<td></td>
<td>We have produced a tariff reform Overview Paper that discusses the 10-year reform horizon (2025). It explains how we have set our tariff structures and how, based on stakeholder feedback, we have chosen a deliberately slow pace of reform for the 2017-20 TS Period.</td>
</tr>
<tr>
<td>(c1a) The overview paper must also include a description of how the Distribution Network Service Provider has engaged with retail customers and retailers in developing the proposed tariff structure statement and has sought to address any relevant concerns identified as a result of that engagement.</td>
<td>Overview Paper</td>
<td></td>
<td>A summary of the engagement program (workshops and individual meetings and correspondence) is included in the Overview Paper. Detail as an Appendix.</td>
</tr>
<tr>
<td>(d1) The proposed tariff structure statement must be accompanied by an indicative pricing schedule.</td>
<td>6.18.1A(e)</td>
<td>Section 6</td>
<td>Refer to the TSS, Section 6 and Appendix A for a detailed response.</td>
</tr>
<tr>
<td>(d2) The proposed tariff structure statement must comply with the pricing principles for direct control services.</td>
<td>6.8.1A(b), 6.18.5</td>
<td>Section 7</td>
<td>Refer to the TSS, Section 7 for a detailed response. The tariff reform Overview Paper summarises our consideration of Customer Impact Principles as well as the Pricing Principles.</td>
</tr>
</tbody>
</table>
6.18.1A | Tariff structure statement
---|---
(a) | A tariff structure statement of a Distribution Network Service Provider must include the following elements:

-1 | the tariff classes into which retail customers for direct control services will be divided during the relevant regulatory control period; 6.18.3 | Section 5 | Refer to the TSS, Section 5 for a detailed response. Also refer to 6.18.3.

-2 | the policies and procedures the Distribution Network Service Provider will apply for assigning retail customers to tariffs or reassigning retail customers from one tariff to another (including any applicable restrictions); 6.18.4 | Section 8, Appendix D | Refer to the TSS, Section 8 and Appendix D for a detailed response. Also refer to 6.18.4.

-3 | the structures for each proposed tariff; | Section 5 | Our standard tariff structure is discussed in the Overview Paper and each tariff presented in detail in the TSS, Section 5.

-4 | the charging parameters for each proposed tariff; and | Section 5 | Our standard tariff structure is discussed in the Overview Paper and each tariff presented in detail in the TSS, Section 5.

-5 | a description of the approach that the Distribution Network Service Provider will take in setting each tariff in each pricing proposal of the Distribution Network Service Provider during the relevant regulatory control period in accordance with clause 6.18.5. | Section 3 | Refer to the TSS, Section 3 for a detailed response.

(b) | A tariff structure statement must comply with the pricing principles for direct control services. 6.8.2(d2), 6.18.5 | Section 7 | Refer to the TSS, Section 7 for a detailed response. The tariff reform Overview Paper summarises our consideration of Customer Impact Principles as well as the Pricing Principles.

(e) | A tariff structure statement must be accompanied by an indicative pricing schedule which sets out, for each tariff for each regulatory year of the regulatory control period, the indicative price levels determined in accordance with the tariff structure statement. 6.8.2(d1) | Section 6 | Refer to the TSS, Section 6 and Appendix A for a detailed response.

6.18.3 | Tariff classes
---|---
(b) | Each customer for direct control services must be a member of 1 or more tariff classes. 6.18.1A (a) (1) | Section 5 | Refer to the TSS, Section 5 for a detailed response. Also refer to 6.18.3.
(c) Separate tariff classes must be constituted for retail customers to whom standard control services are supplied and retail customers to whom alternative control services are supplied (but a customer for both standard control services and alternative control services may be a member of 2 or more tariff classes).

A new tariff class is to be introduced for our larger small business customers that connect directly to a distribution transformer.

(d) A tariff class must be constituted with regard to:

- the need to group retail customers together on an economically efficient basis; and

- the need to avoid unnecessary transaction costs.

6.18.4 Principles governing assignment or re-assignment of retail customers to tariff classes and assessment and review of basis of charging

<table>
<thead>
<tr>
<th>(a)</th>
<th>In formulating provisions of a distribution determination governing the assignment of retail customers to tariff classes or the re-assignment of retail customers from one tariff class to another, the AER must have regard to the following principles:</th>
</tr>
</thead>
<tbody>
<tr>
<td>(b)</td>
<td>If the charging parameters for a particular tariff result in a basis of charge that varies according to the usage or load profile of the customer, a distribution determination must contain provisions for an effective system of assessment and review of the basis on which a customer is charged.</td>
</tr>
</tbody>
</table>

Section 8, Appendix D

Attachment 14 Section D of the 2015-20 determination contains procedures for the reassigning of customers to tariff classes, with which SA Power Networks must comply during the 2015-20 regulatory control period.

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AER Att 14 p14-23 Where the charging parameters for a particular tariff result in a basis of charge that varies according to the retail customer’s usage or load profile, SA Power Networks must set out in its annual pricing proposal a method by which it will review and assess the basis on which a retail customer is charged.

6.18.5 Network pricing objective

Pricing principles

Section 7

Refer to the TSS, Section 7 for a detailed response.
The network pricing objective is that the tariffs that a Distribution Network Service Provider charges in respect of its provision of direct control services to a retail customer should reflect the Distribution Network Service Provider's efficient costs of providing those services to the retail customer.

<table>
<thead>
<tr>
<th>Application of the pricing principles</th>
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<tbody>
<tr>
<td>(b) Subject to paragraph (c), a Distribution Network Service Provider’s tariffs must comply with the pricing principles set out in paragraphs (e) to (j).</td>
<td>Section 7.2 Refer to the TSS, Section 7.2 for a detailed response.</td>
</tr>
<tr>
<td>(c) A Distribution Network Service Provider’s tariffs may vary from tariffs which would result from complying with the pricing principles set out in paragraphs (e) to (g) only:</td>
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<tr>
<td>-1 to the extent permitted under paragraph (h); and</td>
<td>Para (h) refers to the transition provisions.</td>
</tr>
<tr>
<td>-2 to the extent necessary to give effect to the pricing principles set out in paragraphs (i) to (j).</td>
<td>Para (i) refers to the capacity of customers to understand the signals being sent (and respond); Para (j) refers to jurisdictional requirements.</td>
</tr>
<tr>
<td>(d) A Distribution Network Service Provider must comply with paragraph (b) in a manner that will contribute to the achievement of the network pricing objective.</td>
<td>Section 4, 7.1 Refer to the TSS for a discussion of the establishment of efficient costs by the AER and how these are recovered via our tariffs.</td>
</tr>
</tbody>
</table>

### Pricing principles

| (e) For each tariff class, the revenue expected to be recovered must lie on or between: | Section 7.2.1, Appendix C Refer to the TSS. |
| -1 an upper bound representing the stand alone cost of serving the retail customers who belong to that class; and | |
| -2 a lower bound representing the avoidable cost of not serving those retail customers. | |
(f) Each tariff must be based on the long run marginal cost of providing the service to which it relates to the retail customers assigned to that tariff with the method of calculating such cost and the manner in which that method is applied to be determined having regard to:

-1 the costs and benefits associated with calculating, implementing and applying that method as proposed;

-2 the additional costs likely to be associated with meeting demand from retail customers that are assigned to that tariff at times of greatest utilisation of the relevant part of the distribution network; and

-3 the location of retail customers that are assigned to that tariff and the extent to which costs vary between different locations in the distribution network.

Section 7.2.2, Appendix B

Refer to the TSS.

(g) The revenue expected to be recovered from each tariff must:

-1 reflect the Distribution Network Service Provider's total efficient costs of serving the retail customers that are assigned to that tariff;

-2 when summed with the revenue expected to be received from all other tariffs, permit the Distribution Network Service Provider to recover the expected revenue for the relevant services in accordance with the applicable distribution determination for the Distribution Network Service Provider; and

-3 comply with sub-paragraphs (1) and (2) in a way that minimises distortions to the price signals for efficient usage that would result from tariffs that comply with the pricing principle set out in paragraph (f).

Section 2

The Overview Paper provides a summary description of our approach to locational pricing. The long-standing policy commitment to state-wide pricing for small customers effectively precludes us sending locational price signals in our standard tariffs.

7.2.3 Refer to the TSS.
A Distribution Network Service Provider must consider the impact on retail customers of changes in tariffs from the previous regulatory year and may vary tariffs from those that comply with paragraphs (e) to (g) to the extent the Distribution Network Service Provider considers reasonably necessary having regard to:

-1 the desirability for tariffs to comply with the pricing principles referred to in paragraphs (f) and (g), albeit after a reasonable period of transition (which may extend over more than one regulatory control period);

-2 the extent to which retail customers can choose the tariff to which they are assigned; and

-3 the extent to which retail customers are able to mitigate the impact of changes in tariffs through their usage decisions.

(i) The structure of each tariff must be reasonably capable of being understood by retail customers that are assigned to that tariff, having regard to:

-1 the type and nature of those retail customers; and

-2 the information provided to, and the consultation undertaken with, those retail customers.

(j) A tariff must comply with the Rules and all applicable regulatory instruments.

6.18.6 Side constraints on tariffs for standard control services

(a) This clause applies only to tariff classes related to the provision of standard control services.
The expected weighted average revenue to be raised from a tariff class for a particular regulatory year of a regulatory control period must not exceed the corresponding expected weighted average revenue for the preceding regulatory year in that regulatory control period by more than the permissible percentage.

<table>
<thead>
<tr>
<th>6.18.7</th>
<th>Recovery of designated pricing proposal charges</th>
</tr>
</thead>
<tbody>
<tr>
<td>(a)</td>
<td>A pricing proposal must provide for tariffs designed to pass on to retail customers the designated pricing proposed</td>
</tr>
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<thead>
<tr>
<th>6.18.7A</th>
<th>Recovery of jurisdictional scheme amounts</th>
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<tr>
<td>Jurisdictional schemes</td>
<td>Section 7.2.3</td>
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<tr>
<th>6.18.9</th>
<th>Publication of information about tariffs and tariff classes</th>
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<tbody>
<tr>
<td>(a)</td>
<td>A Distribution Network Service Provider must maintain on its website:</td>
</tr>
</tbody>
</table>

| (1) | its current tariff structure statement; |
| (2) | its current indicative pricing schedule; and |
| (3) | a statement of the provider’s tariff classes and the tariffs applicable to each class. |

Refer to the TSS for an explanation of how these Transmission costs are reflected in our tariffs.

Refer to the TSS for an explanation of how these Solar Feed-in Scheme costs are reflected in our tariffs.

- Division 3AB of the Electricity Act 1996 (SA)