Revised Proposal

Attachment 10.06
ES7 Network Price Guide, July 2019

January 2019

Scope

This publication explains the terms and conditions of Ausgrid's Network Use of System (NUOS) tariffs. It does not cover charges for alternative control services.

Document and Amendment History

Date	Approved By	Summary of changes
January 2019	Network Pricing Manager	The document is updated to incorporate all the changes from our Tariff Structure Statement.

Disclaimer

This document has been prepared by Ausgrid in good faith to explain the application of our tariffs.

The information in this document may be subject to revision or replacement due to a range of factors including:

- the evolving electricity market and commercial experience within that market
- regulatory decisions by the Australian Energy Regulator
- changes to the National Electricity Rules
- government and industry regulation.

Application of this document to particular users depends on the circumstances of that user and may vary between users.

This document should be read in conjunction with Ausgrid's Tariff Structure Statement, Ausgrid's Revised Regulatory Proposal for the 2019-24 regulatory period and Ausgrid's 2019/20 Annual Pricing Proposal. These documents are available from www.aer.gov.au or www.ausgrid.com.au.

In the event of inconsistency, the following order of precedence applies:

1. Ausgrid's Revised Regulatory Proposal for the 2019-24 period

2. the relevant annual Pricing Proposal

3. this Network Price Guide.

Accordingly, to the extent permitted by law, Ausgrid excludes liability for all losses, damages, claims and expenses suffered or incurred by any person arising out of or in connection with any use of this document.

Warning

It is the responsibility of the user of this document to ensure that only the current version is being used. Ausgrid may amend this document at any time.

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Feedback

We invite our customers and stakeholders to provide feedback on this document by sending comments and suggestions to:

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Information on Ausgrid's tariffs and policies is available from www.ausgrid.com.au.

CONTENTS

1 Introduction

1.1 Overview of network pricing documents

This document is Ausgrid's Network Price Guide. It provides further information to assist in the application and interpretation of Ausgrid's tariff classes and the tariffs applicable to each class reflected in Ausgrid's 2019/20 Pricing Proposal.

Every five years, Ausgrid submits a regulatory proposal to the Australian Energy Regulator (AER), which includes proposed capital and operating plans and the funding needed to deliver those plans. The AER reviews the regulatory proposal, considers feedback, and decides how much revenue Ausgrid can recover from its customers to fund its operations. The current AER determination for Ausgrid is available at www.aer.gov.au.

Ausgrid submitted a revised Tariff Structure Statement in January 2019 for the period 2019-2024 as required under the National Electricity Rules (NER). It explains Ausgrid's proposed approach to setting tariffs and indicates how the structure and level of tariffs may change over the regulatory period. In April 2019, the AER issued its final decision on Ausgrid's Tariff Structure Statement to apply from 1 July 2019.

Every year Ausgrid is required to submit a pricing proposal to the AER. The pricing proposal sets out Ausgrid's proposed tariffs and demonstrates how the proposed tariffs comply with Chapter 6 of the National Electricity Rules.

Ausgrid's 2019/20 Pricing Proposal was developed in accordance with the requirement set out in the Tariff Structure Statement of January 2019.

Ausgrid's Tariff Structure Statement and the 2019/20 Pricing Proposal are available at www.aer.gov.au or www.ausgrid.com.au. For more information on the distribution pricing arrangements under the National Electricity Rules, refer to www.aemc.gov.au.

Ausgrid publishes an annual Network Price List which sets out the applicable prices for each published Network Use of System (NUOS) tariff and supersedes the prices published for the previous financial year. The latest price list is available at www.ausgrid.com.au.

2 Assigning and reassigning customers to primary tariffs and tariff classes

This section provides a summary of Ausgrid's procedure for assigning new customers to a default NUOS tariff and for reassigning existing customers to another NUOS tariff.

This chapter should be read in conjunction with the Tariff Assignment Procedure set out in the applicable AER Determination and the annual pricing proposal, available at www.aer.gov.au or www.ausgrid.com.au. If there is any inconsistency between this chapter and the Tariff Assignment Procedure, the Tariff Assignment Procedure prevails.

2.1 Assigning new customers to a primary NUOS tariff and tariff class

Ausgrid's procedure for assigning new customers to a default NUOS tariff and reassigning existing customers to another NUOS tariff involves two aspects:

- assigning new customers or reassigning existing customers to the applicable tariff class given their connection characteristics
- assigning new customers or reassigning existing customers to the applicable NUOS tariff within their correct tariff class

Both aspects of Ausgrid's tariff assignment and reassignment procedure are discussed below.

2.1.1 Tariff class assignment

Ausgrid will assign a new customer to a network tariff class by applying the following principles:

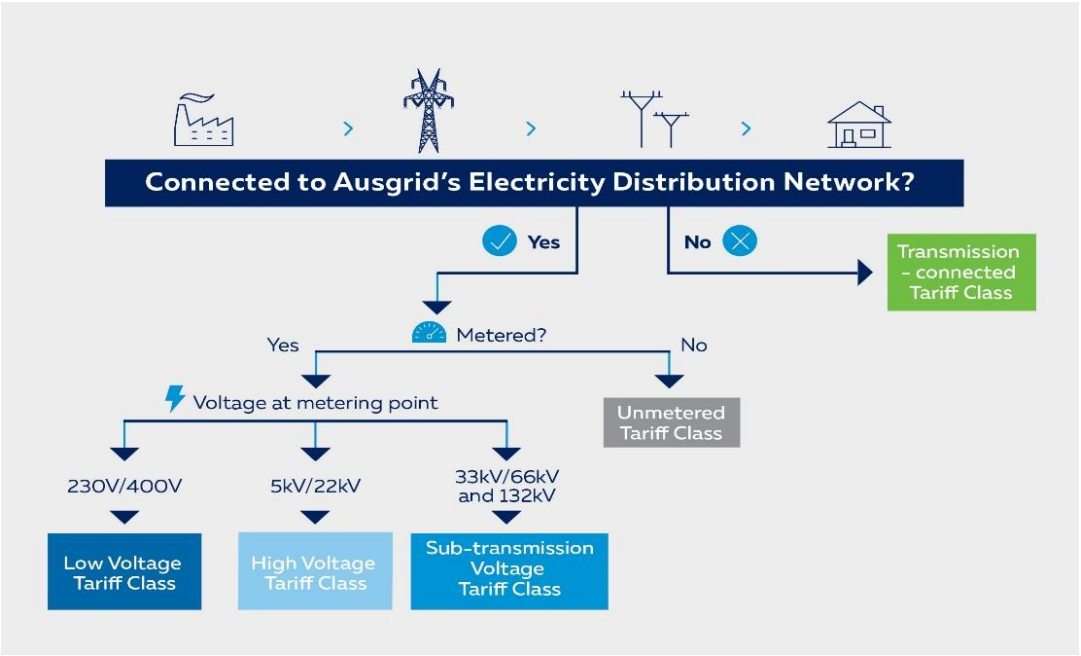
- If the supply is unmetered then the customer will be assigned to the Unmetered tariff class. Appendix C provides more detail about unmetered supplies.
- If the customer's supply voltage as measured at the metering point is either 230V (Single Phase) or 400V (Poly Phase) then the customer will be assigned to the Low Voltage tariff class.
- If the customer's supply voltage as measured at the metering point is greater than 1 kV and less than 33 kV (typically 5 kV, 11 kV or 22 kV) then the customer will be assigned to the High Voltage tariff class.
- If the customer's supply voltage as measured at the metering point is greater than or equal to 33 kV (typically 33 kV, 66 kV or 132 kV) then the customer will be assigned to the Sub-transmission tariff class.

Ausgrid's default tariff class assignment eligibility criteria and procedure is also explained in Table 2.1 and Figure 2.1.

Table 2.1: Overview of eligibility criteria for assigning customers to tariff classes

Tariff Class	Nature of Usage	Nature of Connection to Network	
		Metering	Voltage
Low Voltage	Residential or Business	Metered	230V/400V
High Voltage	Business		5kV, 11kV, 22kV
Sub-transmission	Business		33kV, 66kV, 132kV
Transmission	Business		Applicable to any site that is connected to the electricity transmission network.
Unmetered	Business	Unmetered	230V/400V

Figure 2.1: Overview of NUOS tariff class assignment procedure



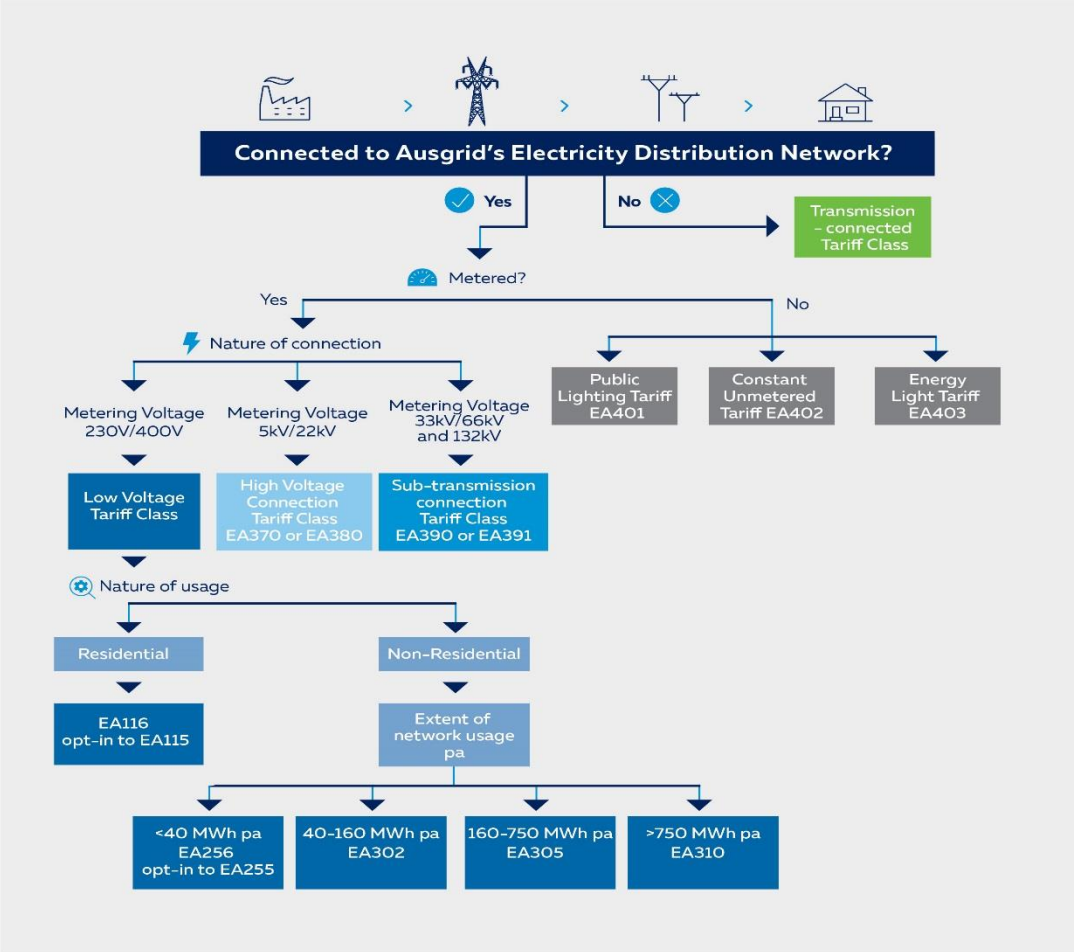
2.1.2 Primary NUOS tariff assignment

The eligibility criteria underlying Ausgrid's procedure for assigning new retail customers to default primary NUOS tariffs and for reassigning existing retail customers to another NUOS tariff is summarised in Table 2.2 and Figure 2.2.

Table 2.2: Assignment of new and existing customers to default primary tariffs

Tariff Class	Nature of Usage	Extent of Usage	NER Meter Type	Tariff code and tariff
Low Voltage	Residential	All	4	EA116 Residential demand
	Business	< 40 MWh per annum	4	EA256 Small business demand
		40-160 MWh per annum	4	EA302 LV 40-160 MWh (System)
		160-750 MWh per annum	≤ 3	EA305 LV 160-750 MWh (System)
		> 750 MWh per annum	≤ 3	EA310 LV > 750 MWh (System)
High Voltage	Business	All	≤ 3	EA370 HV Connection (System)
Sub-transmission	Business	All	≤ 3	EA390 ST Connection (System)
Unmetered	Business	All	-	EA401 Public Lighting EA402 Constant Unmetered EA403 Energy Light

Figure 2.2: Ausgrid's default NUOS tariff assignment procedure for new and existing customers



New Low Voltage customers must have an appropriate NER compliant metering installation connected to support the tariff requirements outlined in this price guide and also meet the requirements of Ausgrid's metering policy, ES3 Part A Metering Installation Requirements.

From 1 July 2019, new residential customers will be assigned to the new EA116 Residential demand tariff, with the option to be reassigned to the EA115 TOU demand tariff. New non-residential customers with expected usage of up to 40 MWh per annum will be assigned to the new EA256 Small business demand tariff, with the option to be reassigned to the EA255 TOU demand tariff. Business customers with a 3 phase connection must have a Type 4 (or better) metering installation, which will result in them being placed on the EA302 tariff if their estimated expected annual consumption is less than 160 MWh per annum.

Customers who have a Type 4 meter (or better) installed due to a customer initiated action, such as an upgrade of the switch board that requires a new meter, and are assessed to consume above 40 MWh per annum will be placed on the EA302 tariff either from the date that the new meter is installed or through the annual review process. If the upgraded meter is a 3 phase meter and the customer is a business, then they will also be transferred to EA302 either from the date that the new meter is installed or through the annual review process.

2.2 Reassigning existing customers to a primary NUOS tariff and tariff class

Table 2.3 describes assignment for customers who change their meter to a Type 4 (smart) meter, depending on whether the customer chooses the meter change or the change is due to meter failure, including network-driven meter family replacement. From 1 December 2017, under the Australian Energy Market Commission's Power of Choice set of regulations, any new or replacement meter will be a Type 4 (smart) meter.

Table 2.3: Existing customers – reassignment to tariffs after meter change after 1 July 2019

Meter change	Customer type	Existing tariff	Tariff after meter change	Options
Due to customer-choice	Residential	EA010, EA025	EA116 – Residential demand	EA115 – Residential TOU demand
	Small business*	EA050, EA225	EA256 – Small business demand	EA255 – Small business TOU demand
Due to meter failure	Residential	EA010	EA111 – Residential demand (introductory) for 12 months then EA116 – Residential demand	EA115 – Residential TOU demand
		EA025	EA116 – Residential demand	
	Small business*	EA050	EA251 – Small business demand (introductory) for 12 months then EA256 – Small business demand	EA255 – Small business TOU demand
		EA225	EA256 – Small business demand	

*Small business is a non-residential customer with up to 40 MWh usage pa.

2.2.1 Annual review and assessment

Ausgrid is required under Chapter 6 of the National Electricity Rules to undertake an annual review and assessment of NUOS tariffs and tariff classes.

There are a number of circumstances where Ausgrid's annual review and assessment may identify that an existing customer is no longer eligible to remain assigned to their existing NUOS tariff because:

- They have changed their voltage level of supply as measured at the metering point to the extent that they are no longer eligible to remain assigned to their existing tariff class.
- They are assigned to the correct tariff class, but have changed their usage of Ausgrid's electricity network to the extent that they are no longer eligible to remain assigned to their existing NUOS tariff.

To avoid unnecessary transaction costs associated with reassigning existing customers to another primary NUOS tariff as part of the annual pricing proposal process where the extent of network usage is a relevant factor, Ausgrid will assess the eligibility of an existing customer to remain on their current NUOS tariff on the basis of the existing customer's energy consumption and maximum demand (if applicable) in the preceding 24 months.

If Ausgrid's annual review and assessment identifies existing customers that are no longer eligible to remain assigned to their current primary NUOS tariff, Ausgrid may reassign these customers to another NUOS tariff for the purpose of the next annual pricing proposal.

Table 2.4 summarises assignment for existing customers. At 1 July 2019,

- Existing customers with a Type 6 (accumulation) meter will remain on their current tariff, either EA010 Residential non-TOU or EA050 Small business non-TOU.
- Existing customers with a Type 5 (interval) meter will remain on or be reassigned to EA025 Residential TOU or EA225 Small business TOU.
- Existing customers with a Type 4 (smart) meter will be reassigned to EA116 Residential demand or EA256 Small business demand.

Residential customers with a Type 4 (smart) meter reassigned to EA116 have the option to request assignment to EA115 Residential TOU demand and non-residential customers reassigned to EA256 have the option to request reassignment to EA255 Small business TOU demand.

Table 2.4: Existing customers – reassignment to tariffs at 1 July 2019

Existing tariff 30 June 2018	Meter type 30 June 2018	Tariff from 1 July 2019	Options
Residential customers			
EA010	Type 6 (accumulation)	EA010 – Residential non-TOU *closed*	
EA011	Type 5 (interval)	EA025 – Residential TOU closed	
	Type 4 (smart)	EA116 – Residential demand	Can ask to be reassigned to EA115
EA025	Type 5 (interval)	EA025 – Residential TOU closed	
	Type 4 (smart)	EA116 – Residential demand	Can ask to be reassigned to EA115
Small business (Non-residential customers up to 40 MWh usage pa)			
EA050	Type 6 (accumulation)	EA050 – Small business non-TOU closed	
EA051	Type 5 (interval)	EA225 – Small business TOU closed	
	Type 4 (smart)	EA256 – Small business demand	Can ask to be reassigned to EA255
EA225	Type 5 (interval)	EA225 – Small business TOU closed	
	Type 4 (smart)	EA256 – Small business demand	Can ask to be reassigned to EA255

Note: *Closed* means only available for customers already assigned to the tariff.

Figure 2.3 summarises assignment for residential customers from 1 July 2019 by meter and tariff type. Figure 2.4 summarises assignment for non-residential customers with up to 40 MWh usage pa.

Figure 2.3: Assignment for residential customers from 1 July 2019

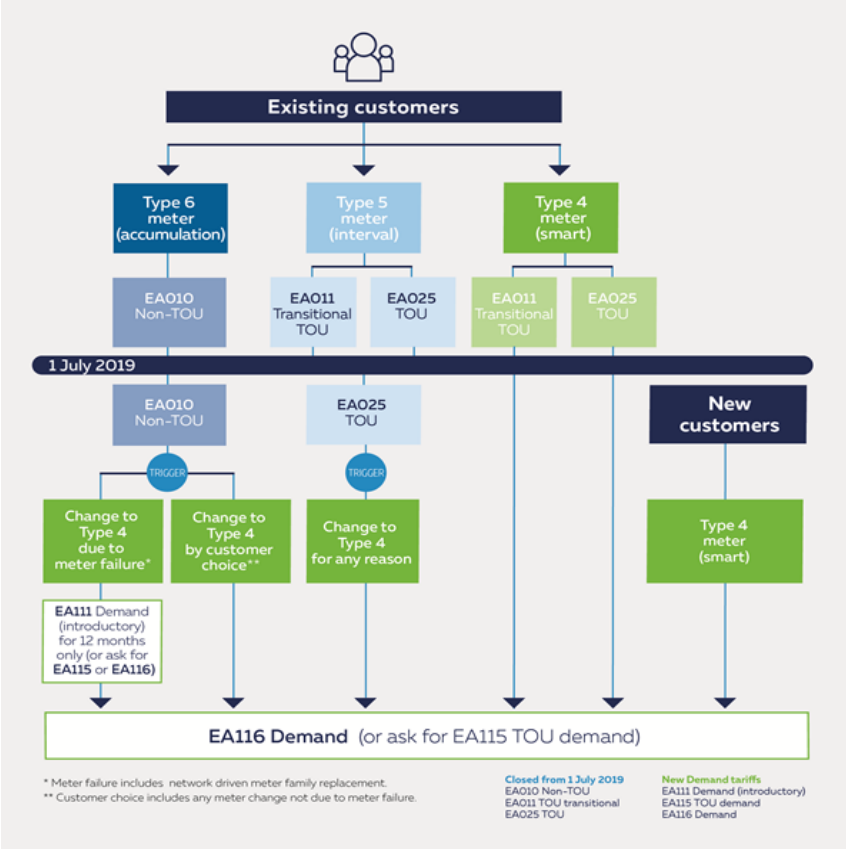
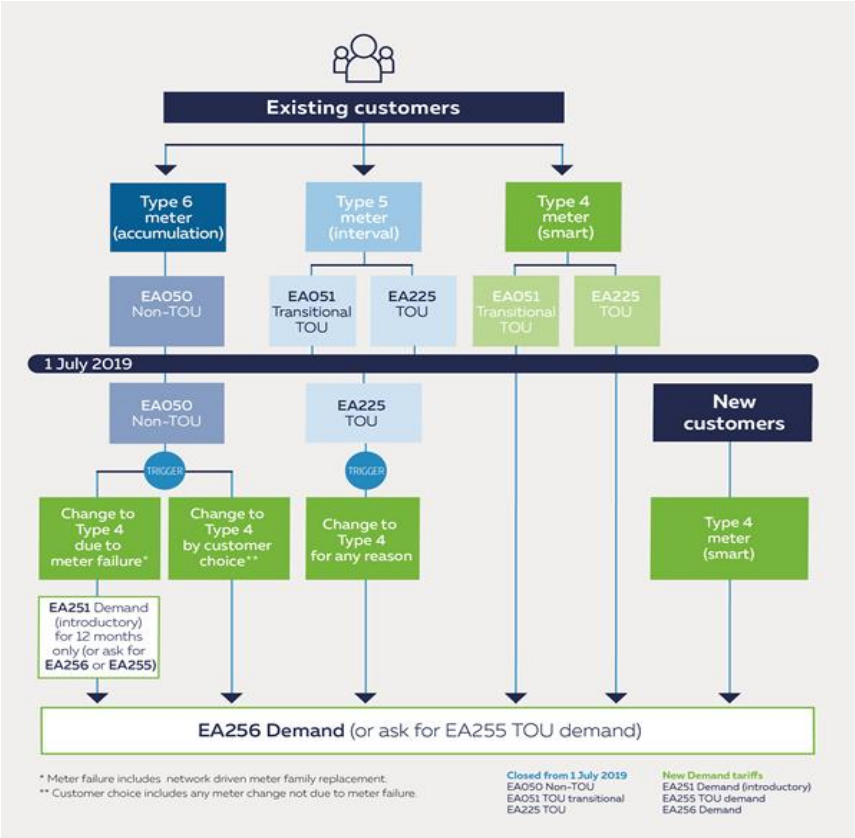


Figure 2.4: Assignment for small business customers from 1 July 2019



2.2.2 Tariff change request application

Retailers may apply on behalf of a customer to be reassigned to another NUOS tariff within the customer's applicable tariff class.

It is the responsibility of the retailer to understand the potential NUOS tariff options available to a customer and to submit a tariff change request application to Ausgrid if they wish to reassign a customer to another NUOS tariff.

All tariff change request applications should be made by the customer's retailer in writing with supporting documentation on a Network Tariff and Threshold Change Application Form (refer to Appendix A). The completed form should be emailed to: nemsrpops@ausgrid.com.au

Ausgrid reserves the right to not process any application if the Network Tariff and Threshold Change Application Form is not sent to the email address specified above and/or based on missing or incomplete data. It should be noted that:

- Ausgrid will only process a tariff change request application from a retailer if the application relates to a customer that has at least 12 months of energy consumption history.
- Ausgrid will process a tariff change request application from a retailer if the application relates to a customer that has not previously applied to be reassigned to another NUOS tariff in the 12 months prior to the date of the application.
- A tariff change request application from a retailer that relates to a customer requesting to be reassigned to an individually calculated tariff must be submitted prior to 30 September for the new tariff to apply from 1 July, to allow sufficient time for Ausgrid to calculate an appropriate distribution load factor for the tariff. Ausgrid is required under Chapter 6 of the National Electricity Rules to submit forecast Distribution Loss Factors to the AER each March.
- If approved, Ausgrid will reassign the customer to the new NUOS tariff from the start of the next billing period following the date of receipt of the tariff change request application. Ausgrid does not permit backdating of any change to the customer's NUOS tariff arrangements where a retailer or a third party acting on behalf of the retailer fails to correctly follow the process set out in this price guide.

3 General description of NUOS tariffs

This section provides a general description of Ausgrid's NUOS tariffs to assist retailers, customers and other stakeholders to understand the application of Ausgrid's Network Price List for 2019/20 (contained in the Regulatory Undertaking) and particularly, Ausgrid's tariff components, tariff structures and billing arrangements.

3.1 Overview of network tariff components

The components of each primary NUOS tariff are summarised in Table 3.1 below.

Table 3.1: Summary of Ausgrid NUOS tariff components

Network Tariff	Network Access Charge	Metering Service Charge	Energy Charge		Capacity Charge	Demand Charge	
			Single Anytime	Time-of-Use		High season	Low season
EA010 Residential Non-TOU (Closed)	✓	✓	✓				
EA025 Residential TOU	✓	✓		✓			
EA111 Residential demand (introductory)	✓			✓		✓	✓
EA115 Residential TOU demand	✓			✓		✓	✓
EA116 Residential demand	✓			✓		✓	✓
EA030 Controlled Load 1	✓	✓	✓				
EA040 Controlled Load 2	✓	✓	✓				
EA050 Small business Non-TOU (Closed)	✓	✓	✓				
EA225 Small business TOU	✓	✓		✓			
EA251 Small business demand (introductory)	✓			✓		✓	✓
EA255 Small business TOU demand	✓			✓		✓	✓
EA256 Small business demand	✓			✓		✓	✓
EA302 LV 40-160 MWh (System)	✓	✓		✓	✓		
EA305 LV 160-750 MWh (System)	✓			✓	✓		
EA310 LV >750 MWh (System)	✓			✓	✓		
EA325 LV Connection (Standby) (Closed)	✓			✓	✓		
EA360 HV Connection (Standby) (Closed)	✓			✓	✓		
EA370 HV Connection (System)	✓			✓	✓		
EA380 HV Connection (Substation)	✓			✓	✓		
EA390 ST Connection	✓			✓	✓		
EA391 ST Connection (Substation)	✓			✓	✓		
EA401 Public Lighting			✓				
EA402 Constant Unmetered			✓				
EA403 Energy Light			✓				
EA501 Transmission Connected	✓			✓	✓		
Individually Calculated Tariffs (ICT)	✓			✓	✓		

3.2 Network Access Charge (NAC)

3.2.1 Applicable tariffs

NAC applies to all NUOS tariffs with the exception of the Unmetered tariff class tariffs.

3.2.2 NAC details

The NAC is a fixed charge (in cents per day) which is applied to each energised connection point at which energy or demand is recorded. A separate NAC may be applied to each connection point and their associated metering points as determined by Ausgrid. NAC also applies to the secondary tariffs EA030 Controlled Load 1 and EA040 Controlled Load 2.

3.3 Meter Service Charge (MSC)

3.3.1 Applicable tariffs

From 1 July 2015, MSC may apply to the following tariffs:

- EA010 Residential Non-TOU (Closed)[1]
- EA030 Controlled Load 1
- EA040 Controlled Load 2
- EA025 Residential TOU
- EA050 Small business Non-TOU (Closed)
- EA225 Small business TOU
- EA302 LV 40-160 MWh (System)

MSC also applies to sites where generation systems (such as solar PV and wind turbines) are connected to the Ausgrid network.

3.3.2 MSC details

Appendix D sets out information behind MSC.

3.4 Single Anytime energy charges

3.4.1 Applicable tariffs

Single Anytime energy charges apply to the following tariffs:

- EA010 Residential Non-TOU (Closed)
- EA030 Controlled Load 1
- EA040 Controlled Load 2
- EA050 Small business Non-TOU (Closed)
- EA401 Public Lighting
- EA402 Constant Unmetered
- EA403 Energy Light

3.4.2 Single Anytime energy charge details

The Single Anytime energy charge is a price charged (in cents per kWh) for energy consumed regardless of when the energy is consumed.

3.5 Time of Use (TOU) energy charges

3.5.1 Applicable tariffs

TOU energy charges apply to the following tariffs:

- EA025 Residential TOU

[1] A 'closed' network tariff is closed to new connections. It continues to be available to existing customers or premises that are currently supplied under that tariff.

- EA111 Residential demand (introductory)
- EA115 Residential TOU demand
- EA116 Residential demand
- EA225 Small business TOU
- EA251 Small business demand (introductory)
- EA255 Small business TOU demand
- EA256 Small business demand
- EA302 LV 40-160 MWh (System)
- EA305 LV 160-750 MWh (System)
- EA310 LV >750 MWh (System)
- EA325 LV Connection (Standby) (Closed)*
- EA360 HV Connection (Standby) (Closed)*
- EA370 HV Connection (System)
- EA380 HV Connection (Substation)
- EA390 ST Connection
- EA501 Transmission Connected
- Individually Calculated Tariffs (ICT)

*Not available to new customers and subject to Ausgrid's approval.

3.5.2 TOU energy charge details

A TOU energy charge is a price charged (in cents per kWh) for energy consumed during specific time periods. Time periods take into account daylight saving time. Appendix G has a detailed explanation of daylight saving time.

From 1 July 2018, seasonal TOU pricing applies as approved by the AER. The time period definitions used in the charging parameters for the TOU energy consumption charge for residential customers are summarised in Table 3.2 and Figure 3.1.

Table 3.2: Energy consumption charge: TOU charging windows for residential customers

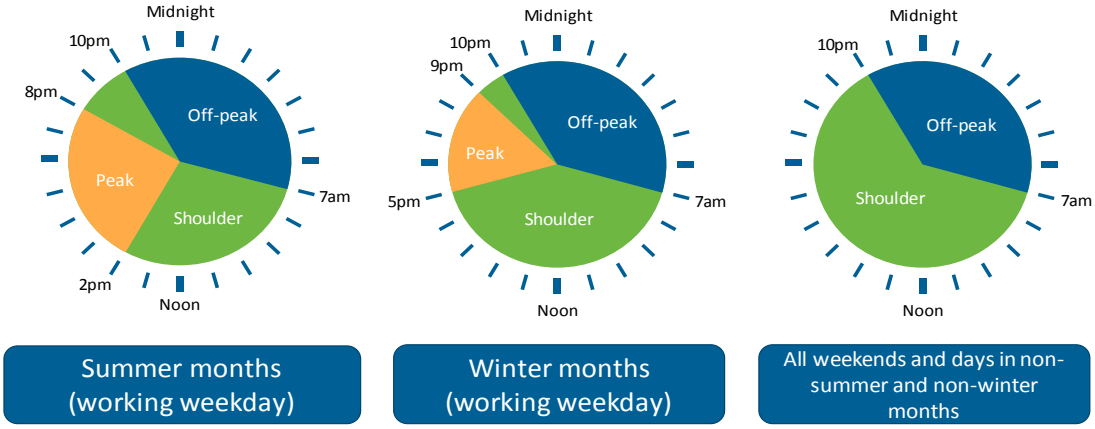
Time period	Time period definition
Peak period	• From 2 pm to 8 pm on working weekdays during 1 November to 31 March (inclusive) – the 'summer months' • From 5 pm to 9 pm on working weekdays during 1 June to 31 August (inclusive) – the 'winter months'.

Shoulder period	The shoulder period applies from 7 am to 10 pm every day, except where a peak period applies during that period.
	Specifically, it applies:
	• from 7 am to 10 pm on all weekends and public holidays
	• on working weekdays in the 'summer months':
	  ○ from 7 am to 2 pm and from 8 pm to 10 pm
	• on working weekdays in the 'winter months':
	  ○ from 7 am to 5 pm and from 9 pm to 10 pm
	• on working weekdays in the non-summer and non-winter months:
	  ○ from 7 am to 10 pm.

Off-peak period	All other times that are not Peak or Shoulder: 10 pm to 7 am.

Note: All times take into account daylight saving during the period gazetted by the NSW Government, generally from 3 am on the first Sunday in October to 2 am on the first Sunday in April.

Figure 3.1: Illustration of seasonal TOU period definitions for residential customers



The time period definitions used in the charging parameters for the TOU energy consumption charge for small business, medium to large low voltage, high voltage and sub-transmission customers are summarised in Table 3.3 and Figure 3.2.

Table 3.3: Energy consumption charge: TOU charging windows for small business, medium to large Low Voltage, High Voltage and Sub-transmission customers

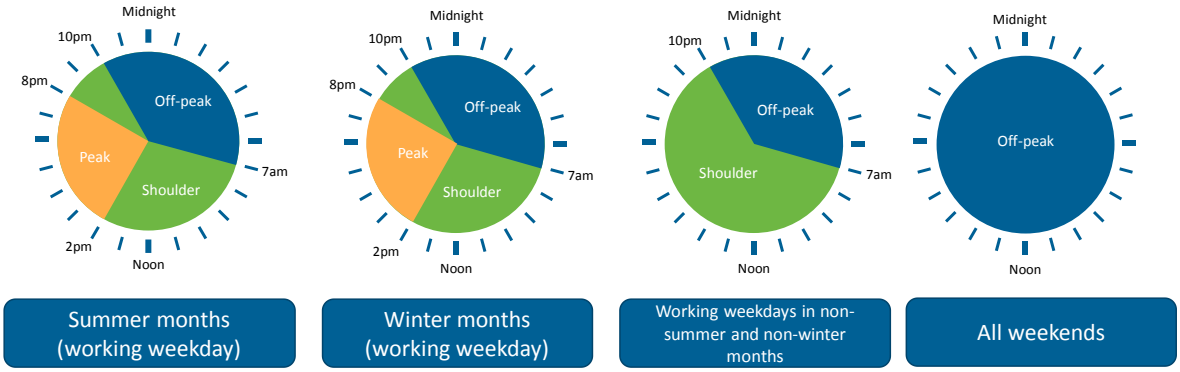
Time period	Time period definition
Peak period	• From 2 pm to 8 pm on working weekdays during 1 November to 31 March (inclusive) – the 'summer months' • From 2 pm to 8 pm on working weekdays during 1 June to 31 August (inclusive) – the 'winter months'.

Shoulder period	The shoulder period applies from 7 am to 10 pm every working weekday, except where a peak period applies during that period.
	Specifically, it applies:
	• on working weekdays in the 'summer' and 'winter' months:
	  ○ from 7 am to 2 pm and from 8 pm to 10 pm
	• on working weekdays in the non-summer and non-winter months:
	  ○ from 7 am to 10 pm.

Off-peak period	All other times that are not Peak or Shoulder: 10 pm to 7 am on working weekdays all year, and 24 hours on all weekends and public holidays all year.

Note: All times take into account daylight saving during the period gazetted by the NSW Government, generally from 3 am on the first Sunday in October to 2 am on the first Sunday in April.

Figure 3.2: Illustration of seasonal TOU period definitions for small business, medium to large Low Voltage, High Voltage and Sub-transmission customers



3.6 Demand charges

3.6.1 Applicable tariffs

Demand charges apply to the following tariffs:

- EA111 Residential demand (introductory)
- EA115 Residential TOU demand
- EA116 Residential demand
- EA251 Small business demand (introductory)
- EA255 Small business TOU demand
- EA256 Small business demand

3.6.2 Demand charge details

Demand charges are based on the monthly maximum amount of electricity consumed by a customer in any half hour interval in the peak period. The time period definitions used in the charging parameters for the demand charge for residential customers are summarised in Table 3.4.

Table 3.4: Demand charge: charging windows for residential customers

Demand window	Time period definition
High season (8 months)	• From 2 pm to 8 pm on working weekdays during 1 November to 31 March (inclusive) – the 'summer months' • From 5 pm to 9 pm on working weekdays during 1 June to 31 August (inclusive) – the 'winter months'.
Low season (4 months)	• From 2 pm to 8 pm on working weekdays during 1 April to 31 May and 1 September to 31 October (inclusive) – the non-summer and non-winter months.

The time period definitions used in the charging parameters for the demand charge for small business customers are summarised in Table 3.5.

Table 3.5: Demand charge: charging windows for small business customers

Demand window	Time period definition
High season (8 months)	• From 2 pm to 8 pm on working weekdays during 1 November to 31 March (inclusive) – the 'summer months' • From 2 pm to 8 pm on working weekdays during 1 June to 31 August (inclusive) – the 'winter months'.
Low season (4 months)	• From 2 pm to 8 pm on working weekdays during 1 April to 31 May and 1 September to 31 October (inclusive) – the non-summer and non-winter months.

*Small business is a non-residential customer with up to 40 MWh usage pa.

3.7 Capacity charges

3.7.1 Applicable tariffs

Capacity charges apply to the following tariffs:

- EA302 LV 40-160 MWh (System)
- EA305 LV 160-750 MWh (System)
- EA310 LV >750 MWh (System)
- EA325 LV Connection (Standby) (Closed)*
- EA360 HV Connection (Standby) (Closed)*
- EA370 HV Connection (System)
- EA380 HV Connection (Substation)
- EA390 ST Connection
- EA391 ST Connection (Substation)
- EA501 Transmission Connected
- (most) Individually Calculated Tariffs (ICT)

*Not available to new customers and subject to Ausgrid's approval.

3.7.2 Capacity charge details

A capacity charge is a price applied (in cents per kW or kVA per day) to the maximum half hourly kW or kVA demand reading[2] that occurred in the period between 2 pm and 8 pm on a working weekday at a customer's connection point over the billing periods that relate to the previous 12 months including the current billing period. The volume to which the capacity charge is applied is known as the "billable maximum capacity".[3]

The time period definitions used in the charging parameters for the capacity charge for medium to large low voltage, high voltage and sub-transmission business customers are summarised in Table 3.6.

[2] Refer to Appendix E – Calculation of Power from Interval Data (Ausgrid) for the calculation of kW and kVA.

[3] Note – Ausgrid reserves the right to apply a nominated maximum capacity value for billing purposes to new large load connections to our electricity network to ensure that these sites contribute equitably to the costs of providing network services to these sites.

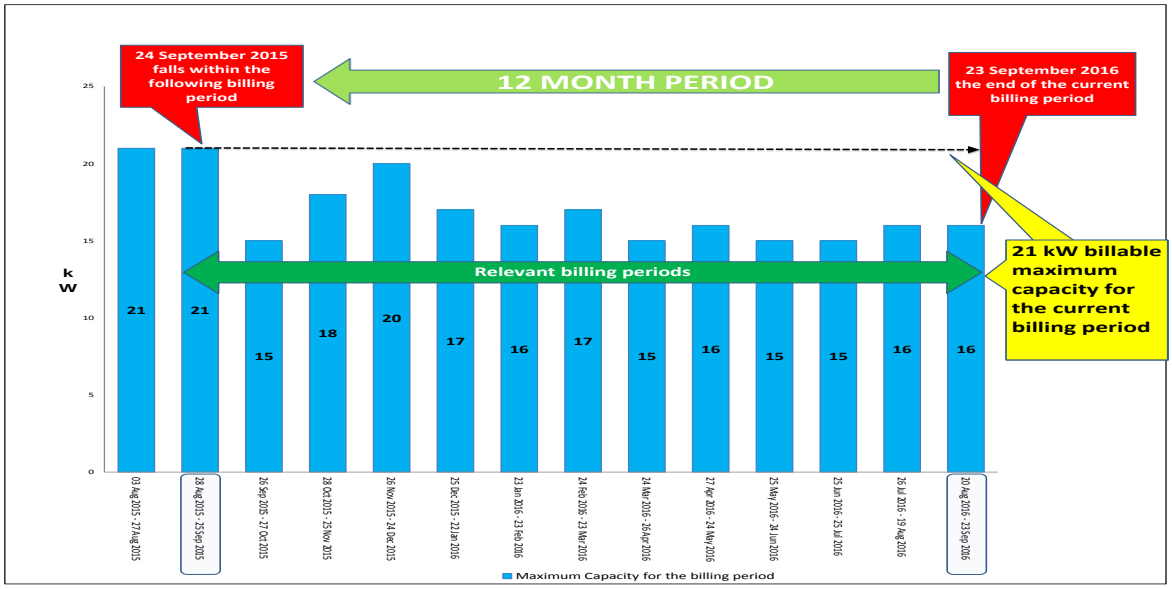
Table 3.6: Capacity charge: windows for medium to large Low Voltage, High Voltage and Sub-transmission business customers

Capacity window	Time period definition
All year round	• From 2 pm to 8 pm on working weekdays.

*Medium to large Low Voltage business customer is a non-residential customer with more than 40 MWh usage pa.

3.7.2.1 Illustrative example of the capacity charge calculation

Below is a numerical example to illustrate the calculation of the billable maximum capacity value for a hypothetical customer.



The billable maximum capacity is based on the billing periods that relate to the previous 12 months including the current billing period. The example above is based on a manually read interval meter.

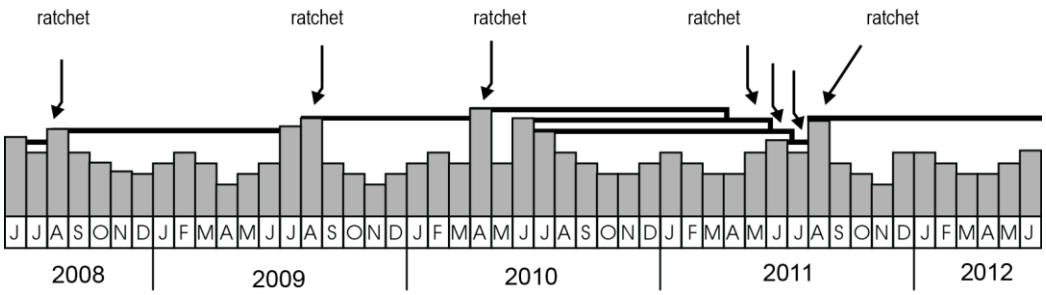
The billable maximum capacity value of 21 kW is assumed to have been recorded on 4 September 2015 from the billing period 28 August 2015 to 25 September 2015.

The billable maximum capacity value of 21 kW for the current billing period is derived from the billing period starting from 28 August 2015 to billing period ending on 23 September 2016.

For Type 1 to 4 metered sites, it will be based on strict calendar months. For Type 5, which are manually read meters as depicted above, it will be based on the billing periods that cover the 12 month period which are dictated by the meter reading schedule/occurrence.

For all meter types, 1 through to 5, where the site transfers or is permanently disconnected mid-month/read cycle, the oldest relevant billing period that will be included in the calculation will be one that includes the current billing period end date minus 12 months plus one day.

3.7.2.2 Illustrative example of the ratcheting of the capacity charge calculation



The historical monthly maximum capacity and billable maximum capacity (represented by the bold lines) of a hypothetical customer are shown above.

During each rolling 12 month period, when a maximum demand that occurred between 2 pm and 8 pm on a working weekday exceeds the existing billable maximum capacity then a new, higher billable maximum capacity occurs. In the above example this occurs in August 2008, August 2009, April 2010 and August 2011.

Conversely, if at the end of each rolling 12 month period the prior month's billable maximum capacity has not been exceeded, then a new, lower billable maximum capacity occurs. The lower billable maximum capacity is the maximum demand that occurred between 2 pm and 8 pm on a working weekday recorded in the preceding 12 month period. In the above example this occurs in April 2011, June 2011 and July 2011.

3.7.2.3 Arithmetic calculation of demand for multiple connection sites

One capacity charge is applied at each connection point. Coincident or summated capacity charges from multiple connection points are not permitted without the written consent of Ausgrid's Manager – Regulation. It is Ausgrid policy to apply arithmetic demand across monthly meter data streams for capacity charging purposes. Coincident or summated demand is not permitted without the written consent of Ausgrid's Manager – Regulation. The one exception to this rule is in the case of two or three phase supply at a connection point, where coincident demand is applied across the phases to determine the maximum demand.

3.7.2.4 Reset of capacity charge volume

In some instances the capacity charge may be reset, either by Ausgrid or at the request of a retailer on behalf of a customer. Retailers are responsible for advising Ausgrid of the customer's capacity reset requirements.

Where a customer plans to permanently reduce their network capacity the customer should provide Ausgrid written notice through their retailer before the planned reduction is to occur. Permanent decreases are a result of the movement in demand due to either planned work to decrease the demand, such as decommissioning the plant or changing plant operations, or when load management equipment is installed. The decrease in capacity will need to be expected to last for at least 12 months before a reset of the capacity charge will be approved by Ausgrid. A temporary reduction in capacity requirements will not result in a reset of the capacity charge. The customer will be required to provide relevant documentation that justifies the expected reduction in the level of billable maximum capacity. As an example, in the case of a factory being converted to a warehouse, a Certificate of Compliance Electrical Works (CCEW) will be required as evidence of the decrease in capacity.

The customer will be advised by Ausgrid of the Billable Maximum Capacity level (reset) that will apply.

Ausgrid will also consider resetting the Billable Maximum Capacity in the following circumstances:

- where a customer has implemented a demand management initiative which will permanently reduce the demand that would occur between 2 pm and 8 pm on a working weekday at the installation, such as power factor correction; or
- where an increase in the Billable Maximum Capacity has been caused by a change to the network configuration initiated by Ausgrid.

Customers that exceed their new Billable Maximum Capacity will see an increase in the capacity charge as usual. Customers may only request one reset per year.

A customer wishing to apply for a reset of the Billable Maximum Capacity may apply to Ausgrid's National Electricity Market Support group by completing the Network Tariff and Threshold Change Application Form (see Appendix A) and emailing it to: nemsrpops@ausgrid.com.au.

3.7.2.5 Retail transfers

When a customer transfers, the following historical information will be required by the new retailer to replicate the capacity calculations:

- a full 12 months of history of maximum demand that occurred between 2 pm and 8 pm on a working weekday (capacity values)
- a list of NMIs which have multiple connection points (where relevant).

This information can be sourced from the National Electricity Market Support group of Ausgrid by emailing: nmi@ausgrid.com.au.

3.7.2.6 Network tariff advice – shifting demand and power factor correction

Customers can minimise their billable maximum capacity level by shifting demand from the period between 2 pm and 8 pm on a working weekday to other time periods.

Customers on a kVA capacity charge can also minimise their billable maximum capacity level by improving the overall power factor of the installation between 2 pm and 8 pm on a working weekday. For further information on power factor correction customers can contact Ausgrid or consult the power factor information at www.ausgrid.com.au.

3.8 Application of Distribution Loss Factors (DLF)

Ausgrid is required under the National Electricity Rules to calculate a Distribution Loss Factor (DLF) for each NUOS tariff. Network charges are calculated on the metered quantities and are not subject to DLF. However, it is the responsibility of Ausgrid to determine and publish DLF.

The DLF are used by retailers in the energy trading and market settlement process to account for electrical losses in the distribution network. The DLF varies depending on the location and voltage of a customer's connection point.

Similarly, Transmission Loss Factors are also used in the market settlement of energy to take account of electrical losses in the transmission network.

The latest DLF are shown on Ausgrid's Network Price List, which is available from www.ausgrid.com.au.

For more information on Ausgrid's methodology for calculating DLF, refer to our DLF methodology document available from www.ausgrid.com.au.

3.9 Additional tariff specific information

3.9.1 Individually calculated tariffs (ICT)

Customers currently on a published NUOS tariff that have network usage that is greater than 10 MW or 40 GWh per annum over a period of a full financial year can apply to be reassigned to an Individually Calculated Tariff (ICT).

The customer application must be submitted to Ausgrid prior to 30 September in the financial year preceding the financial year from which the ICT will apply. This gives Ausgrid sufficient time to calculate an appropriate distribution load factor for the tariff as distribution load factors are required to be submitted by Ausgrid by early March.

3.9.2 Controlled load tariffs

Controlled load tariffs are secondary tariffs. More detailed criteria and general requirements for Controlled load tariffs are in Appendix B.

3.9.3 Temporary supply tariffs

Temporary supply tariffs apply to installations that are not permanently installed or do not provide a permanent supply to the areas in which they are required. The temporary supply tariff is effectively the appropriate existing tariff allocated to a customer as shown in Table 3.7.

Table 3.7: Meters at temporary supplies

Service Type	Capacity*	Meter	Network Price
One Phase (only)	<100 A	Type 5	EA025 Residential ToU
2 – 3 Phase	<100 A	Type 5	EA302 LV 40-160 MWh (System)
		Type 4	EA305 LV 160-750 MWh (System)
	>100 A	Type 3	EA310 LV >750 MWh (System)

*The capacity of the service is the maximum rating of the cable or busbar service as determined by Ausgrid.

A Network Tariff and Threshold Change Application Form (Appendix A) must be submitted for the supply to be considered at a substation price.

The customer is responsible for the costs of installing and dismantling mains, meters and fittings and for the inspection, connection and disconnection of the customer's installation as set out in Ausgrid's publication Connection Policy – Connection Charges.

Temporary supply must be separately metered with Rules compliant meters and will have its own NMI, separate to any permanent supply and will not affect the permanent supply arrangement and its associated NMI.

Coincident demand is not permitted between permanent and temporary connection points.

Where application for temporary supply for the purposes of carrying out experiments in lighting or industrial processes is made in writing and is approved by Ausgrid, supply will be made available at the EA310 LV >750 MWh tariff.

When determining the applicable network charges to be applied, the temporary increase in the maximum power reading (as assessed by Ausgrid) caused by the connection and use of experimental apparatus will be waived, provided that:

(a) Supply will be made available under these conditions only if no alterations to Ausgrid's service or system are involved.

(b) The customer will pay the cost of Ausgrid making only such modifications or additions to its metering equipment as may be necessary for its purposes. However, the customer may arrange for additional metering instruments to be installed by an accredited service provider, the cost of installing and removing these additional instruments to be paid by the customer.

(c) The connection of apparatus under these conditions will be limited to a period of one month unless application for the extension of this period is made in writing and is approved by Ausgrid.

The reconnection of a permanent installation, even for a short period, does not qualify as a temporary supply.

3.9.4 Standby tariffs (closed)

Tariffs EA325 LV Connection (Standby) and EA360 HV Connection (Standby) are now closed. This means that no existing or new customers may be assigned or reassigned to these tariffs except in limited circumstances and at Ausgrid's discretion. Standby supplies are loads not normally connected to the electrical supply system but increase the capacity requirements on the upstream system which must be capable of supplying the standby load in addition to normally supplied loads. In accordance with the current AEMO National Metering Identifier Procedure document, the standby connection point must be assigned a separate NMI to the normal supply point.

The standby supply prices have four charging components. These consist of a fixed charge, and peak, shoulder and off-peak energy charges. The fixed charge is designed to recover the cost of the feeder, even while no capacity is being used. Whether or not the customer uses the supply, the customer will be charged a fixed daily charge for the provision of the supply.

The terms and conditions set out in the connection agreement of a standby supply may vary according to the circumstances and such customers may be required to enter into a connection agreement. Ausgrid reserves the right to reassess existing standby supplies at any time for their impact on the electricity system and apply revised or new standby prices according to current metering and pricing methodologies. In general, standby supplies should not be used as the standard supply for a customer.

A Capital Contribution usually applies to any connection as set out in Ausgrid's publication Connection Policy – Connection Charges.

Electricity supplied under this tariff may be used by the customer for all agreed purposes for which electricity may be required to be used during outages of the normal means of supply at the customer's premises.

For customers requiring standby supply from Ausgrid where agreements have already been entered into which do not comply with these requirements, the existing services are retained unless a change is specifically requested by the customer.

3.9.5 Transitional tariffs

Transitional tariffs EA011 and EA051 are closed from 1 July 2019. Any existing customers on these tariffs will be reassigned to the appropriate tariff according to their meter type.

Residential customers who are on EA011 and have a Type 5 (interval) meter will be reassigned to EA025 Residential TOU. Those who have a Type 4 (smart) meter will be reassigned to EA116 Residential demand.

Small business customers who are on EA051 and have a Type 5 (interval) meter will be reassigned to EA050 Small business TOU. Those who have a Type 4 (smart) meter will be reassigned to EA256 Small business demand.

Glossary

Ancillary network services	Non-routine services provided to individual customers on an “as needs” basis. Examples of these services include providing design related information for connections to be made to our network, special meter reads and site establishment fees.
AEMC	Australian Energy Market Commission
AEMO	Australian Energy Market Operator
AER	Australian Energy Regulator
Basic accumulation metering	Accumulation meters keep track only of the total accumulated electricity usage. Customers are charged the same amount regardless of when the electricity is used.
Billable Maximum Capacity	Has the meaning given to the term in section 3.7.2.
Billing period	The time span covered by a network bill.
Business customer	Refer to Non-residential customer
CCF	Climate Change Fund
Charging parameter	Pricing component that makes up a tariff.
Cost Reflective Network Price	Refer to Individually Calculated Tariff
Current Transformer (CT) connection	A connection where the transformer for use with meters and/or protection devices in which the current in the secondary winding is, within prescribed error limits, proportional to and in phase with the current in the primary winding.
Customer class	Refer to Tariff class
Demand charge	A charge applied to the maximum KW demand in any half hour interval in the peak period in a high or low season month.
Determination	A decision by the AER that determines the revenue allowance for network service providers under the National Electricity Rules.
Distribution Loss Factor	Refer to the definition set out in Ausgrid’s methodology for forecasting distribution loss factors. This document is available from www.ausgrid.com.au.
Distribution Network Service Providers	A person who engages in the activity of owning, controlling or operating a transmission or distribution system and who is registered by AEMO as a Network Service Provider.
Distribution-connected sites	Customers that are connected to the electricity distribution network.
DUOS	Distribution Use of System
Efficiency	Signifies a level of performance that describes a process that uses the lowest amount of inputs to create the greatest amount of outputs.
Existing customer	A customer that exists at the time that Ausgrid undertakes the annual review and assessment in relation to the relevant pricing proposal.
Fixed charge	A charging parameter expressed in cents per day. Also known as Network Access Charge.

High voltage tariff	A tariff that applies to connections that are connected at high voltages 5kV, 11kV or 22kV (as measured at the metering point) that is neither a Sub-transmission nor an individually calculated tariff.
Interval meter	A meter that records how much electricity is used every 30 minutes.
Individually calculated tariff	A tariff that is calculated on a site-specific basis.
Low voltage tariff	A tariff that applies to connections that are connected at low voltages 230V or 400V (as measured at the metering point).
LRMC	Long Run Marginal Cost
Metering point	The physical point of connection between the Consumers Mains and the electrical network. Each separate overhead or underground service is a separate connection point. Each separate busbar or direct cable supply from a single substation is a separate connection point, e.g. two busbar supplies equal two connection points.
Metering services	Services that measure customers' energy consumption and can assist customers to better understand and manage their energy usage.
National Electricity Law	The National Electricity Law set out in the schedule to the National Electricity (South Australia) Act 1996 (SA) and applied in each of the participating jurisdictions.
National Electricity Rules	Refers to the National Electricity Rules (NER) which governs the operation of the National Electricity Market. The Rules have the force of law, and are made under the National Electricity Law.
Network services	Transmission service or distribution service associated with the conveyance, and controlling the conveyance, of electricity through the network.
New customer	A customer that does not satisfy the definition of an existing customer.
Non-residential customer	A customer that does not satisfy the definition of a residential customer. Strata house lights and common areas are classified as non-residential customers.
NUOS	Network Use of System price, which is composed of DUOS, TUOS and CCF prices.
Phase	As defined in the *Service and Installation Rules of New South Wales August 2012.*
Primary tariff and secondary tariff	A primary tariff applies to the principal load of the customer, whereas a secondary tariff applies to separately metered loads on a controlled load circuit which is a controlled supply service, such as off-peak hot water. A secondary tariff is only available to a customer where a primary tariff is also in place.
Public lighting services	Services that involve maintaining and improving the standards of streetlights on behalf of local councils, community associations and statutory authorities across Ausgrid's network.
Regulatory Undertaking	Undertaking given to the Australian Energy Regulator by Ausgrid for the purposes of s.59A of the National Electricity (NSW) Law dated 13 May 2016.
Residential customer	A customer that is assigned to the low voltage tariff class that uses their connection to Ausgrid's electricity network for domestic purposes (e.g. watching television, personal computer usage), except where the use of the network is predominantly for the

	purpose of obtaining a commercial financial gain.
Single phase connection	Refer to Phase
Small business customer	A non-residential customer with less than 40MWh of usage per year.
Sub-transmission voltage tariff	A tariff that applies to connections that are connected at sub-transmission voltages 33kV or greater (as measured at the metering point).
Substation tariff	A tariff that is available to customers who are connected to a Transmission Connection Point Substation with distribution assets dedicated to service only their site.
Tariff	The monetary value assigned to individual charging parameters (i.e. cents per kVA or cents per day).
Tariff class	A class of retail customers for one or more direct control services who are subject to a particular network tariff or particular network tariffs as defined in the National Electricity Rules.
Tariff code	A unique code that identifies each different network tariff.
TSS	Tariff Structure Statement referred to in clause 6.18.1A in the National Electricity Rules that has been approved by the AER for that Distribution Network Service Provider.
Three phase connection	Refer to Phase
Time of Use (TOU) tariff	A tariff with a structure that applies a different price for energy consumed at times of the day.
Transitional tariff	A tariff that may be available for a defined period following changes in the network pricing structures.
Transmission-connected sites	Customers that are connected to the electricity transmission network.
TUOS	Transmission Use of System
Type 4 meter	A metering installation containing an electronic meter, or meters, capable of recording electrical energy consumption in 30 minute market intervals in accordance with the NER. Such meters are remotely read by the metering data provider appointed by the customer's retailer. Also known as smart meters with remote communication capabilities.
Type 5 meter	A metering installation containing an electronic meter, or meters, capable of recording electrical energy consumption in 30 minute market intervals in accordance with the NER. Such meters are read manually by meter readers. Data is down-loaded via probes into a hand-held data collection device carried by Ausgrid meter readers. Also known as an MRIM, TOU or interval meters.
Type 6 meter	A metering installation containing a meter, or meters, (electronic or electromechanical) capable of recording cumulative electrical energy consumption only. Such meters are read manually by Ausgrid meter readers who record the total cumulative consumption readings displayed on the Type 6 meter register. All meters can support a Type 6 Installation, but they are predominantly installed with mechanical meters or simple electronic meters. Also known as BASIC, Flat Rate or accumulation meters.
Unmetered tariff	A tariff for unmetered supply

Appendix A – Network Tariff and Threshold Change Application Form

Network Tariff and Threshold Change Application Form

Customer / Business Name: …… NMI ……..……

Street Number …… Street Name .....

City/Town…… ……..Postcode ……

Additional Site Information: ……

Customer Email Address ……

Name …….. Signed (Customer)……

1. NMI Load/Consumption: Tick ☑ the box of the applicable load (Mandatory)

❑ Below 40MWh p.a. ❑ Between 40 and 160 MWh p.a. ❑ Between 160 and 750 MWh p.a. ❑ Over 750MWh p.a.

2. Network Tariff: Tick ☑ the box of the requested tariff

2A. ❑ EA111 Residential Demand (introductory)	The customer confirms this NMI has annual energy consumption below 160 MWh for residential use and requests the Residential Demand (introductory) network price.
2B. ❑ EA115 Residential TOU Demand	The customer confirms this NMI has annual energy consumption below 160 MWh for residential use and requests the Residential TOU Demand network price.
2C. ❑ EA116 Residential Demand	The customer confirms this NMI has annual energy consumption below 160 MWh for residential use and requests the Residential Demand network price.
2D. ❑ EA251 Small Business Demand (introductory)	The customer confirms this NMI has annual energy consumption below 40 MWh for business use and requests the Small Business Demand (introductory) network price.
2E. ❑ EA255 Small Business TOU Demand	The customer confirms this NMI has annual energy consumption below 40 MWh for business use and requests the Small Business TOU Demand network price.
2F. ❑ EA256 Small Business Demand	The customer confirms this NMI has annual energy consumption below 40 MWh for business use and requests the Small Business Demand network price.
2G. ❑ EA302 LV 40-160 MWh	The customer confirms this NMI has annual energy consumption of between 40 MWh and 160 MWh and requests the LV 40-160 MWh
2H. ❑ EA305 LV 160-750 MWh	The customer confirms this NMI has annual energy consumption of between 160 MWh and 750 MWh and requests the LV 160-750 MWh network price.
2I. ❑ EA310 LV >750 MWh	The customer confirms this NMI has annual energy consumption of more than 750 MWh and requests the LV >750 MWh network price
2J. ❑ EA380 HV Connection (Substation)	The customer requests this site receive the HV Connection (Substation) network price. Fed from the Transmission Connection Point Substation No. ……. Please supply with this application supporting documentation detailing eligibility for application of the substation price.
2K. ❑ EA391 ST Connection (Substation)	The customer requests this site receive the ST Connection (Substation) network price. Fed from the Transmission Connection Point Substation No. ……. Please supply with this application supporting documentation detailing eligibility for application of the substation price.
2L. ❑ Cost Reflective Tariff	The customer requests a Cost Reflective Tariff price. The connection point must have exceeded 10 MW on more than three occasions or 40 GWh consumption over a 12 month period.

2M. ❑ EA501 Transmission Connected

The customer requests a Transmission Connected network price (CRNP). Directly connected to the Transmission Connection Point Substation No. ……. without the use of any distribution assets. Please supply with this application supporting documentation detailing eligibility for application of the Transmission Connected price.

3. Co-incident Demand and Capacity Reset: Tick ☑ the box of the applicable request

3A. ❑ Co-incident Demand across multiple meters at a single connection point (NMI)

The Customer request this connection point be examined to receive Co-incident Demand and to be configured to meet the Code NMI Procedure requirements. If the request is not approved by Ausgrid, the connection point will receive Arithmetic Demand for the meter data streams

3B. ❑ Capacity Reset

The customer requests that the Billable Maximum Capacity value be reset to a level other than the prior 12 month maximum demand.

Reason for the capacity reset:
……..

.....
.
When submitting a capacity reset request, please provide supporting evidence for the reason mentioned.

4. Re-Classification: Tick ☑ the box of the requested re-classification

4A. NMI Re-Classification

❑ Small Where consumption over the last 12 months is below 160MWh
❑ Large Where consumption over the last 12 months is 160MWh

4B. Customer Threshold Code – Business Customer Re-Classification

❑ Low Where consumption over the last 12 months is below 100MWh
❑ High Where consumption over the last 12 months is above 100MWh

The request is endorsed by the customer's *Retailer of Choice* (Not required for business customers directly requesting a change to the customer threshold code)

Retailer Name …… Name: ……

Title: …….. ..... Signed (Retailer)……

Date: ……/……/…… Telephone (Direct line): ……. E-mail: .....

Postal Address: .....

City / Town …… Postcode .....

*NOTE: The above request, if approved, **will not** be backdated and will apply from the start of the next billing period.*

EMAIL requests to nemsrpops@ausgrid.com.au

The correct email address must be used. If a request is sent to the incorrect email address, Ausgrid cannot guarantee a response.

FAX requests (only if unable to email the request) to (02) 9277 3560

Appendix B – Controlled load tariffs

B.1 Tariff criteria

Controlled load tariffs are secondary tariffs and can only be applied at installations with one of the following primary tariffs:

- EA010 Residential Non-TOU (Closed)
- EA025 Residential TOU
- EA050 Small business Non-TOU (Closed)
- EA111 Residential demand (introductory)
- EA115 Residential TOU demand
- EA116 Residential demand
- EA225 Small business TOU
- EA251 Small business demand (introductory)
- EA255 Small business TOU demand
- EA256 Small business demand
- EA302 Low Voltage 40-160 MWh

Secondary tariffs apply to those separately metered loads that are controlled or interrupted in accordance with this document. A secondary controlled load tariff is not permitted at Type 1-3 metering installations.

These secondary tariffs apply to electricity used for operating appliances covered by this document, provided that they comply with the requirements specified. The periods of use of these appliances will be determined by Ausgrid and the load will be controlled at times which may vary from day to day to meet network requirements.

The EA030 Controlled Load 1 tariff is available for supply that is usually connected for at least six hours duration between 10 pm and 7 am. Controlled Load 1 switching times may be varied at the discretion of Ausgrid.

The EA040 Controlled Load 2 tariff is available for supply that is usually connected for at least sixteen hours per day, including at least six hours between 8 pm and 7 am and at least four hours between 7 am and 5 pm. Controlled Load 2 switching times may be varied at the discretion of Ausgrid.

The time period definitions for the two controlled load tariffs are summarised in Table B.1.

Table B.1: Controlled load time periods for residential and small business customers

Controlled load	Time period definition
EA030 Controlled load 1	Supply is usually available for 6 hours duration between 10 pm and 7 am.
EA040 Controlled load 2	Supply is usually available for 16 hours per day including more than 6 hours between 8 pm and 7 am and more than 4 hours between 7 am and 5 pm.

B.2 General requirements

B.2.1 Appliance suitability and contactor installation

Unless otherwise approved by Ausgrid, the following requirements shall be complied with.

- The hours of availability of supply must suit the intended use of the appliance.
- Load control equipment shall comply with the requirements of the NSW Service and Installation Rules of NSW, Section 4.11.3 'Load Control Equipment'.
- The load control device may be contained within the electricity meter so long as the controlled load is resistive, single phase and does not exceed 25 Amp and the total load on the meter does not exceed the current rating of the meter.
- For appliances greater than 10 kW load, please refer to Ausgrid for approval. Contact details are in the ES1 document.

B.2.2 Prohibition of changeover switch, or interconnection between primary and secondary tariffs

Any changeover switch, interconnection arrangement or device which would enable appliances, generation or energy storage systems to be interconnected or switched between controlled load and non-controlled load tariffs is not allowed. This includes traditional changeover switches as well as any changeover or interconnection functionality in other equipment (for example, Uninterruptible Power Supply (UPS) units, inverter equipment, or home energy storage units).

Where a consumer desires to charge energy storage batteries using lower cost energy, and to discharge them to displace higher cost energy, the recommended solution is to do so by using a Time of Use primary tariff.

B.2.3 Noise considerations

Relevant noise regulations should be considered before making a commitment to connect an appliance to a controlled load tariff. The NSW Protection of the Environment (Noise Control) Regulation 2008 specifies restrictions on the hours of operation of appliances that can be heard within a habitable room in any other residential premises. Appliances include heat pump water heaters, air conditioners and swimming pool pumps. Further inquiries about the noise control regulation can be made to the NSW Government (Office of Environment and Heritage) or the NSW Environment Protection Agency.

B.3 Hot water systems (electric water heaters)

B.3.1 Electric storage water heaters

Supply at the Controlled Load 1 or 2 tariffs is available for use with electric storage water heaters with rated hot water delivery and heating element combinations that comply with Table B.2.

Table B.2: Eligibility criteria for Controlled Load 1 and 2 tariffs

Total Rated Hot Water Delivery	Main Element Rating (kW)	
Litres	Controlled Load 1 (EA030)	Controlled Load 2 (EA040)
From 100L to less than 250L	Not eligible	4.8*
From 250L to less than 315L	3.6	4.8*
From 315L to less than 630L	4.8*	4.8*
630L or greater	Required to heat in 9 hours	Determined by Ausgrid

*Special Condition for Newcastle and Hunter Regions, existing installations may use 3.6 kW elements

The main element(s) will be controlled so that supply is available only during hours determined by Ausgrid.

B.3.2 Special conditions for retirement villages and similar accommodation

Table B.3 sets out the reduced minimum rated hot water delivery levels for self-contained and separately metered accommodation.

Table B.3: Eligibility conditions for retirement homes

Maximum Number of Occupants in Premises	Minimum Rated Hot Water Delivery		
	Controlled Load 1	Controlled Load 2	Minimum Rating
One	80 litres	80 litres	3.6kW
Two	125 litres	80 litres	3.6kW

B.3.3 Combinations of storage water heaters

Controlled Load tariffs are available for combinations of storage water heaters dependent on the following conditions being met:

- The combined rated hot water delivery must meet the minimum requirements for the particular tariff.
    - The rated hot water delivery of any heater must be 100 litres or greater.
    - The combined total of the heating elements must be 4.8 kW or greater.
    - The combined rating of the heating element must comply with the conditions of the tariff.
    - Where an additional water heater is being installed and the above three conditions are fulfilled, the usual number of heating hours available for the first heating element should be taken into account in selecting the rating of the additional heating element.
- If the tanks are paralleled to a common hot water line, they will be considered as one. (For example, tank volume and element ratings are the sum of the individual ratings.)

B.3.4 Electrically-boosted solar water heaters

Electrically boosted solar storage water heaters will be supplied at the Controlled Load tariff under similar conditions to other types of electric storage water heaters. The rated hot water delivery will include the electrically heated and solar sections of the unit.

B.3.5 Heat pump water heaters

Heat pump storage water heaters may be supplied by Controlled Load tariffs provided that:

- For connection to Controlled Load 1, a heat pump storage water heater shall be capable of recharging (delta t = 50 deg C) at least 250 litres in 6 hours.
- For connection to Controlled Load 2, a heat pump storage water heater shall be capable of recharging (delta t = 50 deg C) at least 100 litres in 6 hours.

B.3.6 Other heating sources for water heaters

Controlled load tariffs are not available to electrically boosted water heaters where gas, kerosene or other types of fuel are used as the primary source of heating.

B.4 Electric vehicles

B.4.1 Electric vehicle charging

Controlled load tariffs are available for the charging of electric vehicles where an electric vehicle special plug/ socket arrangement – example SAE J1772 (non-standard plug/socket outlet) is used on the vehicle end and the charging equipment or cable is hard-wired on the supply end; or alternatively where an electric vehicle special plug/ socket arrangement – example SAE J1772 (non-standard plug/socket outlet) is used on the vehicle end and on the charging equipment, with a special cable to connect the vehicle to the charger.

B.5 Other equipment

The following equipment may be operated on either Controlled Load 1 or 2, provided that the appliances are permanently connected (connection by means of standard plug/socket outlets is not acceptable). There is no minimum rating requirement for the appliance. For equipment in this category a label shall be installed at the point of hard wired connection of the appliance to alert a service technician or new owner/occupier that the appliance is supplied via a controlled load circuit. The label shall read “Supplied from Controlled Load Circuit” or similar.

- Space heaters (e.g. underfloor heating, thermal storage) and ice thermal storage
- Swimming pool equipment, i.e. pool pumps, water heaters for pools, spas and turbo tubs
- Dishwashers, clothes dryers, washing machines and air conditioners
- Other appliances approved by Ausgrid.

B.6 Special conditions for existing installations

Storage water heaters and thermal storage space heaters, in premises previously supplied at any previous obsolete controlled load tariff, are eligible for supply at one of the current controlled load tariffs, subject to the approval of the installation by Ausgrid and the following requirements.

B.6.1 Existing water heaters

Provided the heating elements comply with the requirements, the following are permitted:

- Existing water heaters formerly supplied at an obsolete tariff may be replaced by heaters of similar or increased capacity and supplied at the current appropriate controlled load tariff.
- Existing water heaters that were eligible for supply at, but not necessarily connected at one of the obsolete controlled load tariffs at the time of installation, may be supplied at the current appropriate controlled load tariff.

Existing units with 3.6kW elements are satisfactory. It is recommended that replacement water heaters use the same element rating as the previous unit provided that the volume of the unit remains the same.

B.7 Implementation of controlled load switching in Type 4 meters

Historically Ausgrid, and its predecessors, have owned and operated the load control units that have implemented the controlled load switching at the customers’ premises. With the advent of multiple metering providers for the residential market (under the Power of Choice Rules change) controlled load functionality can be realised with smart time-switch functionality delivered by independent, AEMO accredited Metering Providers.

All sites with load control must comply with the conditions below:

(a) the obligations of “Safe Operation of Load Control Relay” (set out below) are accepted;

(b) the Service Levels as described below under “Smart Time Switch requirements” are met; and

(c) the metering installation complies with Ausgrid’s Network Documents ES 3 Metering Installation Requirements Part A, and ES 12 Metering Contestability.

Deviation from these requirements is not permitted unless agreed to in writing by Ausgrid. If the conditions are not met then Ausgrid may withdraw permission for a load control tariff at the site.

B.7.1 Safe operation of load control relay

The Metering Provider shall ensure the safe operation of the Load Control Device by using only relays that comply with AS62052.21, with respect to the following minimum performance:

- (U_n) of 207V – 264V and (f_n) of 49-51Hz
- Temperature: -10ºC to +55ºC and Relative humidity of annual mean of <75 % with individual days up to 95%
- (U_c) Rated Breaking Voltage 276V

- (I_c) Rated Breaking Current minimum of 25A single phase resistive
- Short Circuit performance (at 7kA and 3kA) as per the Standard
- Number of operations (30,000) as per the Standard.

B.7.2 Smart time switch requirements

Metering Providers delivering smart time switch functionality shall comply with the following requirements:

- The hardware shall achieve clock accuracy at the same level as the associated advanced meter.
- The hardware shall support a current load control schedule and support a future load control schedule applicable on a future schedule activation date (after deployment). The load control schedule shall be re-configurable.
- Each load control schedule shall support four switching programs that are defined in terms of day type, and season. The day type means applicable days of the week. The seasons means periods of the year. The seasons are defined such that transitions can be achieved either (a) at a fixed date or (b) on a day of month (e.g. first Sunday in October). Each switching program is described by up to two start-times, and matching finish-times. All start times share a common randomised delay start. The start time and finish time is described in 24 hour time – hours and minutes – (hh:mm) – and in Australian Eastern Standard (AEMO) time. The Randomised Delay Start is described as a randomised period of maximum between 0 and 300 minutes (configurable at one minute intervals).
- The hardware's randomisation method shall be selectable between being set (1) once at time of initial configuration and maintained until next configured; or (2) at every switching event. In each case, the randomisation shall apply such that the deployed population, to which the randomisation applies, demonstrates a rectangular statistical distribution of delay across the period.
- At Loss of Supply, the Switch Position is set to OFF, prior to meter shut-down. After supply restoration, the Return to Schedule shall be configurable to apply either (a) immediately or (b) after a randomised delay configurable between 1 and 300 minutes.
- The hardware shall have the capability of responding to a remote override command that can temporarily suspend the load control schedule in the off or on position and when commanded, return to schedule in a progressive fashion. The expectation is that the Metering Coordinator / Metering Provider shall make available the functionality such that when requested by the Network, that the override can apply to all devices in a defined area.
- The hardware may support a Local Boost (load control schedule manual override with load control switch immediately forced to ON position) for the specific purpose of commissioning and fault-finding only. If activated the local boost shall time out at or before the next scheduled switching event. Such local boost facility is for technician use only and shall NOT be accessible to the customer.

B.7.3 Ausgrid specific load control schedules

The load control schedule for network tariffs EA030 Controlled Load 1 and EA040 Controlled Load 2 are summarised in Table B.4.

- Clock accuracy shall maintain ±20s.
- Randomisation Method shall achieve statistically rectangular distribution.
- Loss of Supply Switch Position shall revert to OFF position prior to shut-down of meter and Return to Schedule after a randomised delay of 180 minutes after supply restoration.
- The Suspend Load Control Schedule function, when requested, is expected to reach 80% of devices within 5 minutes.

Table B.4: Load control schedule for Ausgrid's Controlled Load network tariffs

Switching Program	Load Control Schedule Controlled Load 1 (EA030)	Load Control Schedule Controlled Load 2 (EA040)
Winter	1st Sun Apr – 1st Sun Oct Start Time 22:00 Finish Time 07:00 Randomised Delay Start 180min	1st Sun Apr – 1st Sun Oct Start Time 20:00 Finish Time 17:00 Randomised Delay Start 180 min
Spring		1st Sun Oct – 1 Nov Start Time 19:00 Finish Time 16:00 Randomised Delay Start 180 min
Summer	1st Sun Oct – 1st Sun Apr Start Time 21:00 Finish Time 06:00 Randomised Delay Start 180min	
Peak Summer		1 Nov – 1st Sun Apr Start Time 19:00 Finish Time 14:00 Randomised Delay Start 180 min

Appendix C – Unmetered supply tariffs

Unmetered tariffs apply to network customers that are not required to install a meter to measure the flow of electricity in a power conductor and accordingly there is a requirement to determine by other means the energy data that is deemed to flow in the power conductor.

Ausgrid in consultation with AEMO will determine whether a network customer is not required to install a meter in their premise by considering a broad range of factors, such as:

- the load pattern is predictable;
- for the purposes of settlements, the load pattern can be reasonably calculated by a relevant method set out in the metrology procedure;
- it would not be cost effective to meter the connection point taking into account:
    - the small magnitude of the load;
    - the connection arrangements; and
    - the geographical and physical location.

The network tariff applicable to different types of unmetered supplies are set out in the Network Price List. This document is available from www.ausgrid.com.au.

A decision to assign a network customer to an unmetered tariff does not limit Ausgrid's ability to require that this site is metered in the future.

Unmetered sites can be classified as "market" or "non-market". The difference is that market sites have had their loads independently assessed and registered by AEMO meaning that the customer can have choice of retailer. For "non-market" loads, the retailer can only be the local retailer, Energy Australia. To convert from "non-market" to market the customer must follow a set process. Detail can be supplied upon request to nbilling@ausgrid.com.au.

For further Type 7 connection information, see ES1 - Customer Connection Information which is available on the Ausgrid website at www.ausgrid.com.au.

Appendix D – Metering Services Charge (MSC)

D.1 Metering services

Metering services relate to the provision, operation and maintenance of Type 5 and 6 metering equipment, and include:

1. Meter provision – the capital costs of purchase of metering equipment;
2. Meter maintenance – activities to inspect, test, maintain, repair and replace meters;
3. Meter reading – the quarterly or other regular reading of Type 5 & 6 meters; and
4. Meter data services – services for the collection, processing, storage and delivery of metering data and the management of National Metering Identifier (NMI) standing data in accordance with the rules.

To recover the costs of the above services, the MSC has been divided into two components:

- A capital component – metering asset base (MAB) recovery, item 1
- A Non Capital Component - maintenance charge including operating expenditure and tax, items 2 through 4.

D.2 Capital cost recovery

The application of the capital component of MSC will be determined by who originally funded the meters (i.e. the customer directly or spread across all Ausgrid Network customers with metering installed prior to 1 July 2015). From 1 July 2015 to 30 March 2018, Ausgrid charged an up-front fee to cover metering hardware for all new and upgraded metering connections where the customer required an Ausgrid Type 5 or 6 metering installation.

Where it is a new connection installed from 1 July 2015 where Type 5 and 6 metering was installed, the capital component of the MSC will not apply. Where it is an upgrade and the customer did not pay for the meters originally (i.e. meters installed prior to 1 July 2015) the capital component will continue to apply. For all other connections the capital component will apply.

The rate of the capital component to be applied will be determined by the network tariff/s that is/are assigned to the NMI.

Where both capital and non-capital charges are applicable they will be charged at a combined rate.

D.3 Non-capital cost recovery

Ausgrid will charge a maintenance metering service charge for all NMI's where Ausgrid provides Type 5 and 6 metering services. Ausgrid will be nominated as Metering Coordinator, Meter Provider and Meter Data Provider for the NMI in the National Electricity Market. The rate of the non-capital component will be determined by the network tariff/s that is/are assigned to the NMI.

Where both capital and non-capital charges are applicable they will be charged at a combined rate.

Table D.1: Metering Services Charge (MSC) summary table

Charge	Description	When charged
Existing Connections Capital Charge Non-Capital Charge	Charge will be applied to all existing sites where Ausgrid funded the metering equipment and is the market metering service provider. ➢ Metering Coordinator(MC) = ENERGYAP ➢ Meter Data Provider (MDP) = TCAUSTM ➢ Meter Provider B (MPB) = TCAMP ➢ Meter Provider C (MPC) = TCAUSTM Charge includes ACS metering related operating costs and tax	Will not apply where Ausgrid ceases to be the Metering Service Provider. Ausgrid will apply the MSC as a daily charge.
Existing Connections Capital Charge Only	Charge will be applied to all existing sites connected prior to 1 July 2015, where existing Ausgrid funded Type 5 or 6 metering equipment has been replaced by a Type 4 metering installation, to recover the costs of the regulated Metering Asset Base (MAB).	Ausgrid will apply the MSC as a daily charge.
New Connections Non-Capital Charge Only	Charge will be applied to all new or customer instigated upgraded sites where the customer has funded the metering equipment and Ausgrid is the market metering service provider. ➢ Metering Coordinator (MC) = ENERGYAP ➢ Meter Data Provider (MDP) = TCAUSTM ➢ Meter Provider B (MPB) = TCAMP ➢ Meter Provider C (MPC) = TCAUSTM Charge includes ACS metering related operating costs and tax for new connections	Will not apply where Ausgrid ceases to be the Metering Service Provider. Ausgrid will apply the MSC as a daily charge.

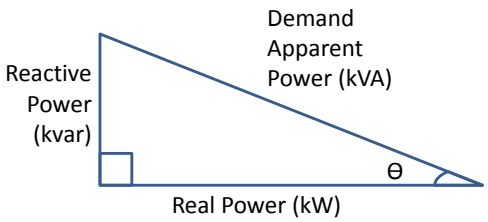
Appendix E – Calculation of Power from interval data (Ausgrid)

Interval meters that comply with the National Electricity Rules record kWh and kvarh consumption in 30-minute blocks aligned with the hour and half hour – and in Australian Eastern Standard Time (AEST). These are also called Trading Intervals. For example, kWh consumption between 11:00 and 11:30 is a trading interval. Similarly, 11:30-12:00 is a trading interval.

The NEM also allocates Data Stream Identifiers to correctly tag the data from the meters:

Import kWh (real energy generation by customer)	B
Export kWh (real energy consumption by customer)	E
Import kvarh (leading reactive energy)	K
Export kvarh (lagging reactive energy)	Q

Network capacity charges are based on the Real Power (kW) or Apparent Power (kVA). kW can be derived directly from kWh. However Apparent Power requires an intermediate calculation, explained by the Power Triangle diagram, which describes the relationship between all three types of power. It also describes the term of Power Factor.



$$Power\ Factor = \cos(\theta) = \frac{Real\ Power}{Apparent\ Power}$$

$$Apparent\ Power = kVA = \sqrt{kW^2 + kvar^2}$$

E.1 Power principle

A customer's maximum power is a measure of the capacity that must be provided by the network. Power has two components, termed real and reactive:

- The Real Power is that which performs useful work, such as providing heating and motion.
- The Reactive Power component is necessary for the flow of real power, and is part of the total demand upon the supply system. The distribution network must be built to carry the Apparent Power.

Reactive power typically results from the inductive loads such as coils in industrial AC inductive motors and transformers. It is the inductance of the coils that causes the difference between the real power and the apparent power.

To determine the average apparent power for a given 30-minute interval, the following calculations are made:

$$kW = \frac{kWh_{30\ min}}{0.5} = 2 \times kWh_{30\ min}$$

$$kvar = \frac{|kvarh(lag)_{30\ min} - kvarh(lead)_{30\ min}|}{0.5} = 2 \times |kvarh(lag)_{30\ min} - kvarh(lead)_{30\ min}|$$

$$kVA = \sqrt{kW^2 + kvar^2}$$

In terms of NMI data stream suffixes, this can be simplified to the following calculation for each **30-minute** interval:

$kW = 2 \times E$
$kVA = 2 \times \sqrt{E^2 + (Q - K)^2}$

Appendix F – Methodology for calculating Avoided TUOS payments

F.1 Background

Under the National Electricity Rules, Ausgrid is required to pay Avoided Transmission Use of System (ATUOS) to eligible Embedded Generators (EG) in Ausgrid's electricity distribution network.

ATUOS payments recognise that energy supplied to the DNSP by the embedded generator would have otherwise been supplied from the electricity transmission network. The National Electricity Rules require that the ATUOS payable to an eligible embedded generator is calculated using a 'with and without' approach involving:

- Calculation of the actual TUOS charges payable by the DNSP;
- Calculation of the hypothetical TUOS charges payable by the DNSP if the Embedded Generator had not existed; and
- Payment of the full difference in the above to the embedded generator as ATUOS.

F.2 Methodology for calculating ATUOS payment

Ausgrid's methodology for calculating ATUOS payments is based on the maximum demand KW charge applied to the maximum demand of the embedded generator (kWh) using the "with and without" methodology. Importantly, this methodology does not take into account the economic benefit provided to the rest of the electricity transmission network. For example, the peak demand of the generator may not necessarily occur at a time that causes a reduction in the overall transmission network peak demand.

F.3 ATUOS calculation method – "with and without" method

$$\text{ATUOS} = \text{TUOS}_{\text{withoutEG}} - \text{TUOS}_{\text{withEG}}$$

where:

$$\text{TUOS}_{\text{withoutEG}} = \text{Demand\_Tariff} \times \text{Transmission\_Peak\_Demand}_{\text{withoutEG}}$$

$$\text{TUOS}_{\text{withEG}} = \text{Demand\_Tariff} \times \text{Transmission\_Peak\_Demand}_{\text{withEG}}$$

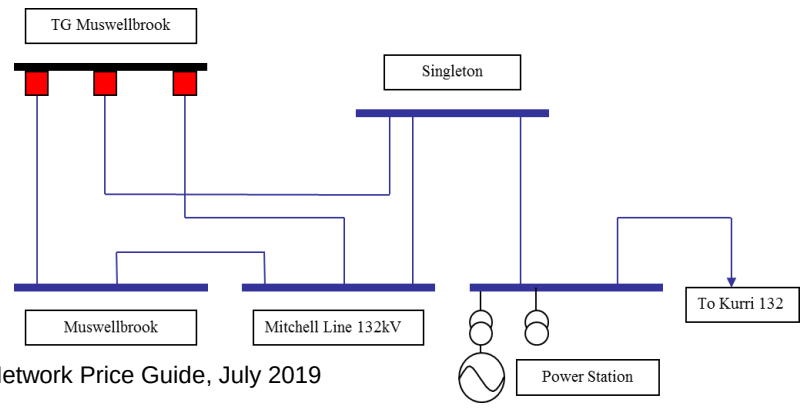
combining the above:

$$\text{ATUOS} = \text{Demand\_Tariff} \times (\text{Transmission\_Peak\_Demand}_{\text{withoutEG}} - \text{Transmission\_Peak\_Demand}_{\text{withEG}})$$

This section details the ATUOS calculation method by way of illustrative example.

Calculation example for Avoided TUOS

Figure F.1: The 132kV network near Muswellbrook, with Hypothetical Power Station 1 receiving an ATUOS payment from Ausgrid



As outlined in section 5.5 (i) of the Rules, the ATUOS payments are calculated on a 'with and without' basis. For the **'With case'** (ie. including actual generation at Power Station 1):

Determine the load for the TransGrid metering points at Muswellbrook. The result is labelled L_{With} , which, through Kirhcoff's Current Law, 'automatically' takes into account the generation at Hypothetical Power Station 1.

Therefore we write:

$L_{Actual} = L_{With} = L_{TransGrid} - L_{PowerStation1}$

Now apply the TransGrid prices to the L_{With} load to determine the B_{With} TransGrid bill.

B_{With} = Billing of L_{With}

For the **'Without case'** (ie. No generation at Hypothetical Power Station 1):

Determine the load for the TransGrid metering points at Muswellbrook, had Power Station 1 not been generating. This is the sum of the metering points at TransGrid Musswellbrook and the actual generation at Hypothetical Power Station 1. This results in $L_{Without}$ because:

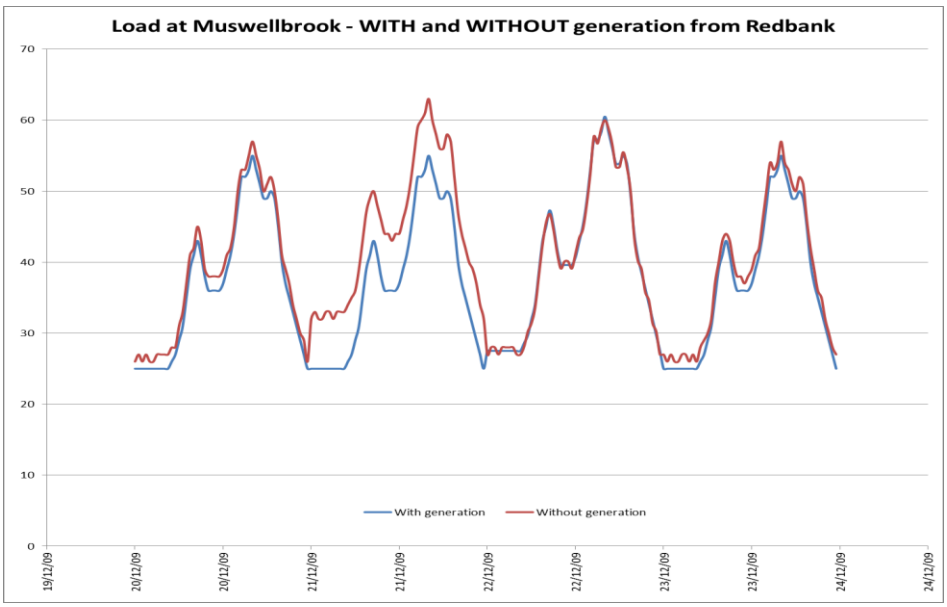
$L_{Actual} + L_{Powerstation1} = (L_{TransGrid} - L_{Powerstation1}) + L_{Powerstation1} = L_{TransGrid} = L_{Without}$

Now apply the TransGrid prices to the $L_{Without}$ load to determine the $B_{Without}$ TransGrid bill.

$B_{Without}$ = Billing of $L_{Without}$

The figure below shows the 'With' and 'Without' case half hourly load (selected days). For the 'With" case, demand charges for the actual TransGrid bill are based on the maximum demand visible on 22 December (3rd daily cycle shown). For the "Without" case, demand charges for a hypothetical TransGrid bill are based on the peak load visible on 21 December (2nd daily cycle shown).

Figure F.2: Load at Muswellbrook with and without generation from Power Station 1



Determining the amount payable for avoided TUOS

The amount payable by the DNSP to the embeded generator is therefore:

ATUOS amount = $\mathbf{B_{Without} - B_{With}}$

F.4 Metering considerations

The load figures used in the above calculations are not necessarily net at each point. For instance:

- The TransGrid charges at Muswellbrook are based on the E register[4] only, so the above calculations should use E only, not the (E-B) figures.
- The National Electricity Rules state describe the 'Without' case as if the Embedded Generator had 'not injected any energy' [5.5(i)(1)(i)]. Thus it is appropriate to use the pure injection volume rather than the net injection volume (B register rather than (B-E) figure). This corresponds with the viewpoint that since Power Station 1 pays network charges for its auxiliary supply (the E register), it has the right to use load when it sees fit, and must be considered separately to ATUOS considerations.

Selection of relevant Transmission price for calculation of ATUOS payment

There are two types of locations of embedded generators within the Ausgrid's electricity network:

- Embedded generators near transmission connection points owned by TransGrid – Ausgrid in its capacity as a DNSP is directly invoiced by TransGrid for the use of these assets, so it is clearly appropriate to use the transmission charges at TransGrid owned transmission connection points for the purpose of calculating ATUOS payments for a specific embedded generator.
- Embedded generators near dual-function connection points owned by Ausgrid – Ausgrid in its capacity as a DNSP is not invoiced by TransGrid for the provision of these services. Ausgrid earns its annual revenue allowance for its dual-function assets via the setting of designated pricing proposal charges in its capacity as a DNSP. It is for this reason that Ausgrid's methodology for the calculation of ATUOS is based on the transmission charges at the TransGrid-owned transmission connection point (as opposed to the Ausgrid-owned transmission connection point) nearest to the embedded generator.

F.5 Interaction with other embedded generators

In some instances, there are multiple embedded generators feeding into a transmission node. The ATUOS calculations for each site assume that all other embedded generators operate independently of the embedded generator of interest. The other embedded generators are implicitly included in the $L_{TransGrid}$ figure by way of Kirchoff's Current Law.

[4] AEMO National Metering Identifier Procedure August 2009, p.49.

Appendix G – Daylight Saving Time

The time periods defined in Ausgrid's Network Price List and ES7 apply to local time in New South Wales. Local time is the same as Daylight Saving Time while it is in operation, and for the rest of the year, local time is the same as Eastern Standard Time.

Ausgrid's prices are structured to follow the local time, whether that is Australian Eastern Standard or Daylight Savings Time.

Customers on non-Time of Use network prices are not affected by Daylight Saving Time. Customers on Time of Use network prices, but without Rules compliant meters installed, have their meters programmed to adjust automatically to Daylight Saving Time.

Where customers have joined the contestable market and have National Electricity Rules compliant metering, half hourly energy consumption data is forwarded to Ausgrid's Meter Data Provider (MDP). For the period that Daylight Saving Time operates the Meter Data Provider converts the customer's energy consumption to local time for the purpose of calculating consumption in each time period. The Meter Data Provider stores all data in Eastern Standard Time.

G.1 Start and end of Daylight Saving Time

The following convention is used in NSW:

Start: Daylight Saving Time (DST) normally begins at 2am Eastern Standard Time (EST) on the first Sunday in October. Therefore at 2am EST the clocks are put forward by one hour. The time then becomes 3am DST.

During Daylight Saving, local time in New South Wales is one hour in advance of Eastern Standard Time.

Finish: Daylight Saving Time normally ends at 3am DST on the first Sunday in April. Therefore at 3am DST the clocks are put back by one hour. The local time then goes in line with 2am EST.