Avoided Transmission Use of System

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TasNetworks acknowledges the palawa (Tasmanian Aboriginal community) as the original owners and custodians of lutruwita (Tasmania). TasNetworks, acknowledges the palawa have maintained their spiritual and cultural connection to the land and water. We pay respect to Elders past and present and all Aboriginal and Torres Strait Islander peoples.

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Introduction

The purpose of this document is to explain to customers the principles governing the remuneration of eligible embedded generators (**EEGs**) who are connected to TasNetworks' distribution network, via a mechanism called avoided Transmission Use of System (**avoided TUoS**).

This document outlines the methodology we will use to calculate Avoided Transmission Use of System for eligible customers.

Background

TasNetworks' distribution network connects to TasNetworks' transmission network at multiple connection points. There is a cost to the distribution network for use of transmission services at these connection points. If the injection of electricity into TasNetworks' distribution network by an EEG causes a reduction in the charge to the distribution network for the use of transmission services at these connection points then TasNetworks will pass on those savings to the EEG, as it is required to do under the National Electricity Rules (**Rules**), as payments for avoided TUoS.

In accordance with the Rules[1], TasNetworks will pay EEGs based upon the cost of the locational component that would have been payable to the TNSP had an EEG not been connected to the network.

Details on transmission pricing methodology can be found on TasNetworks website[2]. However, regarding the calculation of avoided TUoS, the pricing can be explained basically that the transmission network service provider (**TNSP**) recovers its prescribed TUoS services revenue from three different pricing mechanisms, a common service charge, a non-locational charge, and a locational charge.

The charge that is relevant for avoided TUoS is the locational component of prescribed TUoS services. A locational charge ($/MW) is determined for each Transmission-Distribution connection site. These are published annually on our website by the 15 March[3]. The locational charge is multiplied by the specified contract capability of the Transmission-Distribution connection site.

[1] NER, Clause 5.3AA(h)
[2] Regulated Transmission Pricing - TasNetworks
[3] Transmission Prices - TasNetworks

TasNetworks' requirements

In accordance with the Rules[4], where specified prices for the locational component of prescribed TUoS services were in force at the relevant transmission network connection point throughout the relevant financial year, TasNetworks is required to:

a) Determine the costs for the locational component of prescribed TUoS services that would have been payable by the distribution network had the EEG not injected any energy at its connection point during that financial year;

b) Determine the amount by which the costs calculated in (a) exceed the amount for the locational component of prescribed TUoS services actually payable by the distribution network; and

c) Pay the value from (b) to the EEG.

The cost for the locational component of prescribed TUoS services is calculated as the prescribed TUoS locational price ($/MW/day) at the relevant connection point multiplied by the specified contract capability (MW).

Setting the contract capability

TasNetworks specifies the required locational contract capability for each transmission connection point on an annual basis via the transmission pricing mechanism. In setting the contract capability, demand at the transmission connection point is reduced by the energy injected by the EEG (although the generation capability of the embedded generator is not directly considered). The contract capability must be set at the maximum demand expected so it is a measure of peak demand. Therefore, the extent to which the EEG injects energy at the time(s) of peak demand (or what would have been peak demand at the transmission connection had they not injected the energy) is factored into determining the avoided TUoS payment.

Eligibility

To be eligible to receive avoided TUoS payments, an embedded generator must have a connection agreement with TasNetworks and be:

- Registered with AEMO; or
- If not registered meet the following criteria:
  a) are not using micro-embedded generators (size limited up to 200 kW as defined by AS 4777);
  b) are not required to connect under a standard connection service; and
  c) have made an election under clause 5A.A.2(c) to seek connection of the relevant embedded generating unit under rule 5.3A instead of under Chapter 5A.

Avoided TUoS payments are required to be paid in instances where the injection of electricity by an EEG has actually reduced TasNetworks' locational TUoS Payments, therefore no EEG can receive avoided TUoS payments if they did not inject energy into the distribution network during the relevant interval or period.

[4] NER, Clause 5.3AA(i)

Calculation methodology

The methodology for the calculation of the avoided TUoS amount is:

(a)	determine the ten half hour periods[5] for the financial year of highest deemed demand in the absence of the EEG at the distribution connection point to the transmission network based on: Half hourly demand at the connection point (in MW) *Plus* Coincident export from the EEG adjusted for distribution losses (in MW)
(b)	for the ten half hour periods determined under (a): The average coincident export from the embedded generator (adjusted for distribution losses[6]) that reduced TasNetworks TUoS payment (in MW) *Multiply by* The TUoS locational price at the connection point ($/MW) *Multiplied by* The number of days eligible for avoided TUoS in the year

In cases where the EEG is connected to the distribution network in a location which is serviced by multiple Transmission-Distribution connection sites, the energy will be apportioned between the connection sites in accordance with an appropriate 'engineering' calculation. This calculation will take into consideration the topology of the network and how the energy flows through the network to the relevant Transmission-Distribution connection site. TasNetworks must disclose, as requested, the basis of any such calculation to the EEG in question.

If more than one EEG is allocated to the same Transmission-Distribution connection site, the assessment of avoided TUoS will be based on the coincident output of those generators, with any savings apportioned between generators on a proportional basis.

[5] NMI data is converted to 30-minute interval data for the purposes of calculating avoided TUoS.
[6] AEMO Distribution Loss Factors

Worked example

Assumptions	
1.	Contract capability at distribution connection point A = 8MW.
2.	Actual demand at distribution connection point A for ten highest demand intervals = 7MW (excluding EEG exports).
3.	Coincident export from EEG at connection point A for ten highest demand intervals = 4MW (adjusted for distribution loss factors). In this case distribution loss factor of 1.0579 is included so absolute export of 4MW i.e., 4.23MW / 1.0579
4.	Locational price at connection point A is $70 per MW per day.
5.	Eligibility days = 365 days (i.e., EEG was connected for the full year).
Calculations on a per interval basis using the above formula and assumptions	
i)	Determine the ten half hour periods for the financial year of highest deemed demand in the absence of the EEG at the distribution connection point A: = 7MW + 4MW = 11MW.
ii)	For the ten half hour periods in (i) above, the average coincident export from the EEG (adjusted for distribution losses) that reduced TasNetworks' TUoS payment: = 11MW – 8MW = 3MW = 3MW x $70 x 365 = $76,650 In this worked example it was assumed that the ten highest demand intervals are identical so the total avoided TUoS payment for the year would be $76,650

Note:

- There may be instances where the co-incident embedded generation output is zero at the distribution connection point, resulting in no avoided TUoS payment.

Payment

Avoided TUoS payments to EEGs will be calculated retrospectively after the end of the financial year, no later than 30 September. EEGs will receive a letter notifying them of the calculated amount, requesting them to issue TasNetworks with a tax invoice quoting the supplied purchase order number. Payment will be made via electronic funds transfer upon receipt of a valid tax invoice.

Glossary

Term or Abbreviation	Description
Avoided TUoS	Refers to the additional locational charges that would have been payable by TasNetworks, in its capacity as a DNSP, to the TNSP, had an embedded generator not injected energy at its connection point into the distribution network.
AEMO	Australian Energy Market Operator
Contract capability	The contract capability is the maximum demand expected thorough the connection point at a point in time.
Connection point	The point on a distribution feeder at which an embedded generator is connected to the high voltage distribution network.
Connection agreement	An agreement between TasNetworks and an embedded generator under which the embedded generator is connected to TasNetworks' distribution network and/or receives distribution services (i.e., the conveyance of electricity via the distribution network).
Demand	Electricity consumption at a point in time
Distribution network	The assets and services that carry the electricity conveyed from generators by the high voltage transmission system and deliver it to individual consumers at the lower voltages to operate lighting, heating, appliances and industrial equipment.
DNSP	Distribution network service provider e.g., TasNetworks.
EEG	Eligible embedded generator.
kW, MW	Kilowatt, Megawatt
Micro embedded generation	A micro embedded generator is a retail customer that operates an embedded generating unit for which a micro embedded generator connection to the distribution network is appropriate. Customers with generating units of the kind contemplated by AS 4777 (i.e. Solar) are considered micro embedded generation with a size limit of up to 200 kW.
NER, or the Rules	National Electricity Rules
Transmission-Distribution connection site	A facility owned and operated by a TNSP that connects the transmission network with the distribution network, containing transformers which reduce voltage from transmission level to distribution level, commonly known as substation

Term or Abbreviation	Description
Transmission network	The assets and services that enable large generators, e.g., windfarms, hydro-electric power stations, to transmit the high voltage electrical energy they produce to population centres and major industrial users of electricity
TNSP	Transmission network service provider e.g., TasNetworks
TUoS	Transmission Use of System.
TUoS locational price	TUoS locational prices reflect the asset values associated with the parts of the network that service particular connection points, as well as the level of contracted demand at that connection point and are expressed as a price per MW.



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