

Proposed Pricing methodology

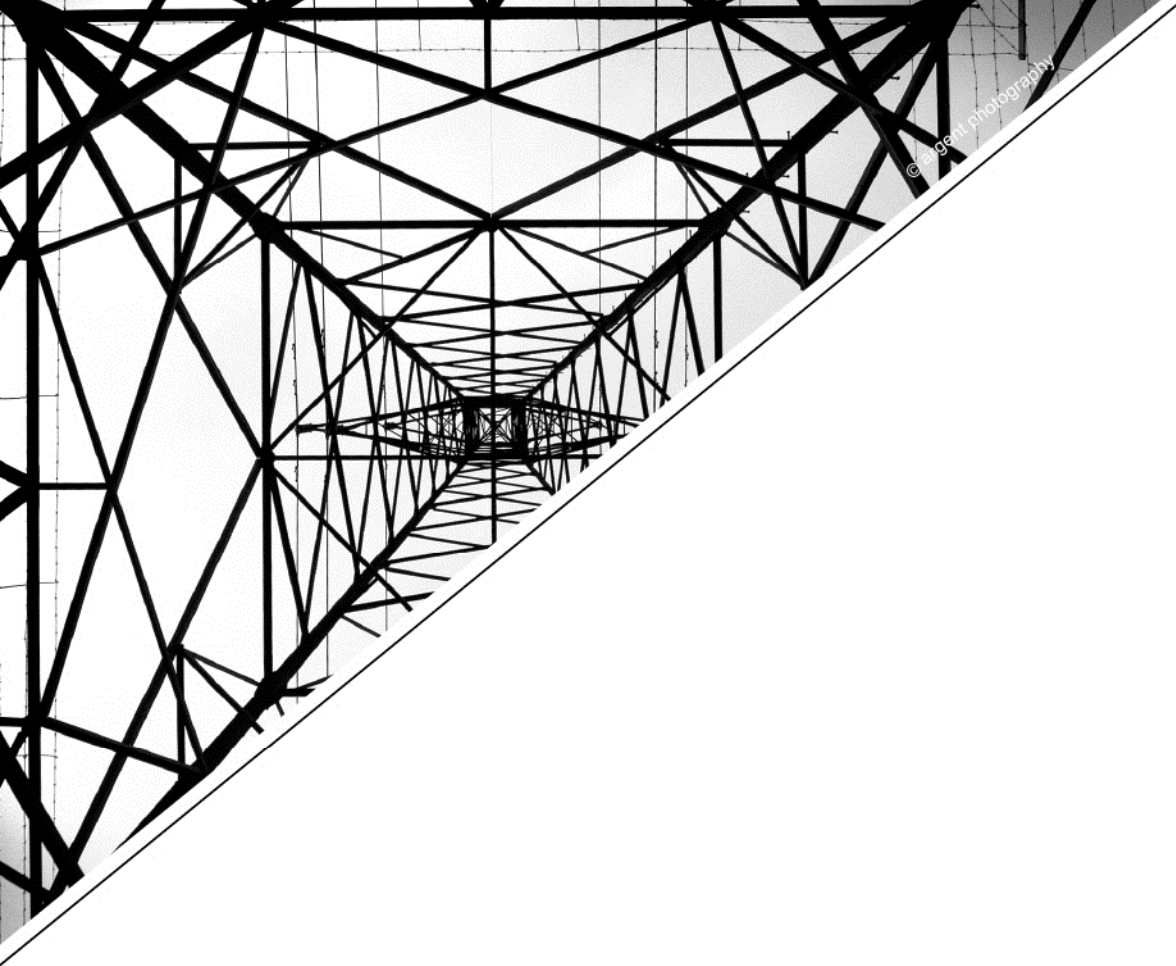
Appendix 23



Tasmanian Networks Pty Ltd



Transend Networks Pty Ltd



Proposed Pricing Methodology

1 July 2015 to 30 June 2019

Version 1



TRANSEND

Our mission is transmission

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Document History and Status

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1 Introduction

Transend Networks Pty Ltd is the electricity *Transmission Network Service Provider (TNSP)* in Tasmania.

This proposed *pricing methodology*, for the regulatory period from 1 July 2015 to 30 June 2019, is submitted to the Australian Energy Regulator (AER) in accordance with the requirements of chapter 6A of the National Electricity Rules (the *Rules*) and the AER's *pricing methodology guidelines*.

2 Interpretation

All terms in this proposed *pricing methodology* that are italicised have the meaning given to them in the *pricing methodology guidelines* or, where no definition is provided in that document, the *Rules*.

3 Prescribed transmission services

Transend's proposed *pricing methodology* relates to the provision of *prescribed transmission services* in Tasmania by Transend. These services include:

- *shared transmission services* provided to customers directly connected to the *transmission network* and connected *Network Service Providers (prescribed TUOS services)*;
- *connection services* provided to connect the *distribution network* to the *transmission network (prescribed exit services)*;
- grandfathered *connection services* provided to *Generators* and customers directly connected to the *transmission network* for *connections* that were in place or committed to be in place on 9 February 2006 (*prescribed entry services* and *prescribed exit services*); and
- services that provide equivalent benefits to all *Transmission Customers* without any differentiation based on their location, and therefore cannot be reasonably allocated on a locational basis (*prescribed common transmission services*).

Transend's proposed *pricing methodology* does not relate to the provision of *negotiated transmission services* or other *transmission services* provided by Transend that are not subject to economic regulation under the *Rules (non-regulated transmission services)*.

4 Rules requirements

Clause 6A.24.1(b) of the *Rules* states that a *pricing methodology* is a methodology, formula, process or approach that, when applied by a *TNSP*:

- (1) allocates the aggregate annual revenue requirement (AARR) for prescribed transmission services provided by that *TNSP* to:
 - (i) the categories of *prescribed transmission services* for that *TNSP*; and
 - (ii) *transmission network connection points* of *Transmission Network Users*; and
- (2) determines the structure of the prices that a *TNSP* may charge for each of the *categories of prescribed transmission services* for that *TNSP*.

The *Rules* also require that the *pricing methodology* satisfy principles and guidelines established by the *Rules*. In particular, clause 6A.10.1(e) of the *Rules* requires that a proposed *pricing methodology* must:

-
- (1) give effect to and be consistent with the *Pricing Principles for Prescribed Transmission Services* (that is, the principles set out in Rule 6A.23 of the *Rules*); and
 - (2) comply with the requirements of, and contain or be accompanied by such information as is required by, the *pricing methodology guidelines* made for that purpose under Rule 6A.25 of the *Rules*.

Further, under clause 6A.24.1(d) of the *Rules* a *TNSP* must comply with: the *pricing methodology* approved by the *AER* as part of a *transmission determination* that applies to that *TNSP*, and any other applicable requirements in the *Rules*, when the *TNSP* is setting the prices that may be charged for the provision of *prescribed transmission services*.

5 Pricing methodology guidelines requirements

The *pricing methodology guidelines* supplement and elaborate on the *Pricing Principles for Prescribed Transmission Services* contained in chapter 6A of the *Rules* in so far as they specify or clarify:

- the information that is to accompany a proposed *pricing methodology*;
- permitted pricing structures for the recovery of the locational component of *prescribed TUOS services*;
- permitted postage-stamp pricing structures for the recovery of the adjusted non-locational component of *prescribed TUOS services* and *prescribed common transmission services*;
- the types of *transmission system assets* that are directly attributable to each category of *prescribed transmission services*; and
- the parts of a proposed *pricing methodology*, or the information accompanying it that will not be publicly disclosed without the consent of the *TNSP*.

All key elements of Transend's proposed *pricing methodology* are permissible under the *pricing methodology guidelines*. These elements include:

- calculation of the locational component of *prescribed TUOS services* costs using the *modified cost reflective network pricing methodology*;
- the locational *prescribed TUOS services* price being based on *contract agreed maximum demand*;
- the postage-stamp basis of pricing structures for the non-locational component of *prescribed TUOS services* and *prescribed common transmission services* being based on *contract agreed maximum demand* or historical energy;
- the methodology for implementation of priority ordering (being the priority ordering approach under clause 6A.23.2(d) of the *Rules*);
- a description of how asset costs which may be attributable to both *prescribed entry services* and *prescribed exit services* will be allocated at a *connection point*;
- a description of billing arrangements under clause 6A.27 of the *Rules*;
- a description of prudential requirements as outlined in clause 6A.28 of the *Rules*;
- the inclusion of hypothetical worked examples;
- a description of any differences between the pricing methodology applied during the current *regulatory control period* and that proposed for the next *regulatory control period*; and

-
- a description of how Transend intends to monitor and develop records of its compliance with its approved *pricing methodology*, the *Pricing Principles for Prescribed Transmission Services* (clause 6A.23 of the Rules) and part J of the *Rules* in general.

6 Proposed pricing methodology

6.1 Background

In December 1999, the Tasmanian Electricity Regulator issued a determination in relation to electricity pricing policies. As part of that determination, Transend was required to develop a transmission pricing policy through a consultative process with (Tasmanian Electricity) Code Participants and interested parties. In November 2000 Transend's original Transmission Pricing Policy was published, describing how transmission prices were determined and applied in Tasmania from that date. It was based on pricing principles set out in the Tasmanian Electricity Code – as it existed then – and the State Regulator's Pricing Determination of December 1999. The Transmission Pricing Policy was updated regularly, including when Transend became subject to the (then) National Electricity Code.

Transend's *pricing methodology*, applicable from 1 July 2009 to 30 June 2014, was prepared to satisfy the requirements of the *Pricing Principles for Prescribed Transmission Services*, Part J of the Rules and the AER's *pricing methodology guidelines*. It was approved by the AER in its decision on Transend's transmission determination for 2009-10 to 2013-14 of April 2009.

This proposed *pricing methodology*, applicable from 1 July 2015 to 30 June 2019, proposes minor amendments to:

- permit reductions to *contract agreed maximum demand* applied to reduce *contract agreed maximum demand* based charges in prevailing financial year where the reduction is not temporary in nature (section 6.11.3); and
- include specific standby provisions in section 6.12 of this proposed *pricing methodology* to encourage customers to better manage their peak demand and reduce the impact on the *transmission network* at times of high network utilisation.

6.2 Single transmission network service provider

Transend is the sole provider of *prescribed transmission services* within Tasmania and is responsible for the allocation of the AARR within Tasmania, in accordance with clause 6A.29.2 of the *Rules*.

6.3 Aggregate annual revenue requirement

The revenue that a *TNSP* may earn in any *regulatory year* of a *regulatory control period* from the provision of *prescribed transmission services* is known as the *maximum allowed revenue*.¹

The AARR is calculated in accordance with clause 6A.22.1 of the *Rules* as:

“the *maximum allowed revenue* referred to in clause 6A.3.1 adjusted:

- (1) in accordance with clause 6A.3.2, and

¹ Clause 6A.3.1 of the *Rules*.

-
- (2) by subtracting the operating and maintenance costs expected to be incurred in the provision of *prescribed common transmission services*.”

The adjustments referred in (1) above could relate to a number of factors including:

- reopening of the *revenue determination* for capital expenditure (not being a *pass through event* or a *contingent project*) under clause 6A.7.1 of the *Rules*;
- *network support pass through* under clause 6A.7.2 of the *Rules*;
- cost pass through under clause 6A.7.3 of the *Rules*;
- *service target performance incentive scheme* outcomes under clause 6A.7.4 of the *Rules*;
- *contingent projects* under Rule 6A.8 of the *Rules*; and
- revocation of *revenue determination* for wrong information or error under clause 6A.15 of the *Rules*.

The costs referred in (2) above are derived from budget projections and include:

- network switching and operations;
- administration and management of the business;
- network planning and development; and
- general overheads.

6.4 Categories of transmission services

Transend’s *AARR* is recovered from transmission charges for the following *categories of prescribed transmission services*:

- *prescribed entry services*, which include services provided by assets that are directly attributable to serving a *Generator* or group of *Generators* at a single *connection point* and are deemed to provide a *prescribed transmission service* by virtue of the operation of clause 11.6.11 of the *Rules*;
- *prescribed exit services*, which include services provided by assets that are directly attributable to serving a *Transmission Customer* or group of *Transmission Customers* at a single *connection point* and:
 - a are deemed prescribed by virtue of the operation of clause 11.6.11 of the *Rules*; or
 - b are *exit services* provided to *Distribution Network Service Providers*;
- *prescribed common transmission services*, which are services that provide equivalent benefits to all *Transmission Customers* without any differentiation based on their location, and therefore cannot be reasonably allocated on a locational basis; and
- *prescribed transmission use of system (TUOS) services*, which include services that provide benefits to *Transmission Customers* depending on their location within the *transmission system*, that are shared to a greater or lesser extent by all users across the *transmission system* and are not *prescribed common transmission services*, *prescribed entry services* or *prescribed exit services*.

6.5 The pricing process

The determination of *prescribed transmission service* prices involves five steps:

-
- (1) allocation of the costs of *transmission system* assets to the *categories of prescribed transmission service*, to the extent to which assets are directly attributable to the provision of a *category of prescribed transmission services* (section 6.6);
 - (2) calculation of the *attributable cost shares* (section 6.7);
 - (3) calculation of the *Annual Service Revenue Requirement (ASRR)* by the allocation of the *AARR* to each *category of prescribed transmission services* in accordance with the *attributable cost share* for that *category of prescribed transmission services* (section 6.8);
 - (4) allocation of the *ASRR* for *prescribed entry services*, *prescribed exit services* and *prescribed TUOS services* to each *transmission network connection point* in accordance with the principles set out in clause 6A.23.3 of the *Rules* (section 6.9); and
 - (5) calculation of prices for each category of *prescribed transmission service* (section 6.11).

Each step is described in further detail below.

6.6 Cost allocation

The **first step** in calculating *prescribed transmission service* prices is to allocate the costs of transmission system assets to the *categories of prescribed transmission services* in section 6.4 above, to the extent to which assets are directly attributable to the provision of a *category of prescribed transmission services*.

The delineation between the assets that provide *prescribed entry services*, *prescribed exit services*, *prescribed TUOS services* and *prescribed common transmission services* is set out in clause 2.4 of the *pricing methodology guidelines*.

The Transend cost allocation process assigns the optimised replacement cost (ORC)² of all assets providing *prescribed transmission services* to individual network pricing branches. Each network pricing branch is then defined as common, connection (entry or exit) or shared network. The pricing branches are used to determine the costs of the *transmission system* assets directly attributable to each *category of prescribed transmission services*, as required under chapter 6A of the *Rules*. This cost allocation process is explained in more detail in Appendix B.

6.6.1 Allocation of assets providing shared connection services

In the case of a shared *connection* asset (such as a transformer) serving multiple *transmission connection points*, which may provide both *prescribed entry services* and *prescribed exit services*, the cost of the shared *connection* asset will be allocated to the appropriate *category or categories of prescribed transmission services* based on a negotiated agreement between the parties involved.

In the absence of any such agreement, any such assets will be attributed on the basis of *contract agreed maximum demand* and the installed *generator* capacity of each *Transmission Network User*.

6.7 Calculation of the attributable cost share for each category of service

The **second step** in calculating *prescribed transmission service* prices is the calculation of the *attributable cost shares*. The *attributable cost share* for each *category of prescribed transmission services* is calculated in accordance with clause 6A.22.3 of the *Rules* as the ratio of:

² Consistent with clause 6A.22.3(b) of the *Rules*.

- (1) The costs of the transmission system assets directly attributable to the provision of that category of prescribed transmission services; to
- (2) The total costs of all the TNSP's transmission system assets directly attributable to the provision of prescribed transmission services,

where these amounts are determined as detailed in section 6.6 above.

For example, if the ORC's of *prescribed transmission services* assets have been allocated to the applicable *categories of prescribed transmission services* as shown in Table 1 then the *attributable costs shares* are calculated as shown in the hypothetical example below:

Table 1 Hypothetical costs allocated to categories of prescribed transmission services

Category	ORC (\$)
Exit services	10,000,000
Entry services	5,000,000
TUOS services	65,000,000
Common services	20,000,000
Total	100,000,000

$$\begin{aligned}
 \text{Attributable cost share}_{\text{EXIT}} &= \text{ORC}_{\text{EXIT}} / \text{ORC}_{\text{TOTAL}} \\
 &= \$10,000,000 / \$100,000,000 \\
 &= 0.10
 \end{aligned}$$

with the *attributable cost shares* of the other *categories of prescribed transmission services* calculated in the same manner, as shown in Table 2.

Table 2 Hypothetical attributable cost shares

Category	ORC	Attributable cost share
Exit services	10,000,000	0.10
Entry services	5,000,000	0.05
TUOS services	65,000,000	0.65
Common services	20,000,000	0.20
Total	100,000,000	1.00

6.8 Calculation of the annual service revenue requirement (ASRR)

The **third step** in calculating *prescribed transmission service* prices is to allocate the *AARR* to each *category of prescribed transmission services* in accordance with the *attributable cost share* for that *category of prescribed transmission services*.

This allocation results in the *ASRR* for each *category of prescribed transmission services*.

Assuming an *AARR* of \$8,000,000 and applying the *attributable cost shares* determined above, the *ASRR* for each category of prescribed transmission services is calculated as:

$$\begin{aligned}
 \text{ASRR}_{\text{EXIT}} &= \text{AARR} \times \text{Attributable cost share}_{\text{EXIT}} \\
 &= \$8,000,000 \times 0.10 \\
 &= \$800,000
 \end{aligned}$$

with the *ASRRs* of the other categories of *prescribed transmission services* calculated in the same manner.

Table 3 Hypothetical annual service revenue requirements

Category	Attributable cost share	Annual Service Revenue Requirement (\$)
Exit services	0.10	800,000
Entry services	0.05	400,000
TUOS services	0.65	5,200,000
Common services	0.20	1,600,000
Total	1.00	8,000,000

6.9 Allocation of the ASRR to transmission network connection points

The **fourth step** in calculating *prescribed transmission service* prices is to allocate the *ASRR* for *prescribed entry services*, *prescribed exit services* and *prescribed TUOS services* to each *transmission network connection point* in accordance with the principles of clause 6A.23.3 of the *Rules*.

6.9.1 Prescribed entry services

The whole of the *ASRR* for *prescribed entry services* is allocated to each *transmission network connection point* in accordance with the *attributable connection point cost share* for *prescribed entry services* that are provided by the *TNSP* at that *connection point*.

The *attributable connection point cost share* for *prescribed entry services* is the ratio of the costs of the *transmission system* assets *directly attributable* to the provision of *prescribed entry services* at that *transmission network connection point* to the total costs of all the *TNSP's transmission system* assets *directly attributable* to the provision of *prescribed entry services*.

For example, if two Generators, Gen A1 and Gen A2, receive *prescribed entry services* and the cost allocation process has allocated the ORCs of assets *directly attributable* to *prescribed entry services* to them as shown in Table 4.

Table 4 Hypothetical prescribed entry services ORCs

Entry service (connection point)	ORC (\$)
Gen A1	3,500,000
Gen A2	1,500,000
Total ORC of prescribed entry assets	5,000,000

$$\begin{aligned}
 \text{Attributable connection point cost share}_{\text{GEN A1}} &= \text{ORC}_{\text{GEN A1}} / \text{ORC}_{\text{ENTRY}} \\
 &= \$3,500,000 / \$5,000,000 \\
 &= 0.70
 \end{aligned}$$

with the *attributable connection point cost share* of the other *Generator* being calculated in the same manner, shown in Table 5.

Table 5 Hypothetical attributable connection point cost shares

Entry	ORC (\$)	Attributable connection point cost share
Gen A1	3,500,000	0.70
Gen A2	1,500,000	0.30
Total	5,000,000	1.00

The *ASRR* allocated to the Gen A1 *transmission network connection point* is calculated as follows:

$$\text{ASRR}_{\text{GEN A1}} = \text{ASRR}_{\text{ENTRY}} \times \text{Attributable connection point cost share}_{\text{GEN A1}}$$

$$= \$400,000 \times 0.70$$

$$= \$280,000$$

with the *ASRR* for the Gen A2 *transmission network connection point* being calculated in the same manner.

Table 6 Hypothetical connection point ASRRs (entry)

Entry service (connection point)	ORC (\$)	Attributable connection point cost share	Connection point ASRR (\$)
Gen A1	3,500,000	0.70	280,000
Gen A2	1,500,000	0.30	120,000
Total	5,000,000	1.00	400,000

6.9.2 Prescribed exit services

The whole of the *ASRR* for *prescribed exit services* is allocated to each *transmission network connection point* in accordance with the *attributable connection point cost share* for *prescribed exit services* that are provided by the *TNSP* at that *connection point*.

The *attributable connection point cost share* for *prescribed exit services* is the ratio of the costs of the *transmission system assets directly attributable to the provision of prescribed exit services at that transmission network connection point* to the total costs of all the *transmission system assets directly attributable to the provision of prescribed exit services*.

The *ASRRs* of the *prescribed exit services connection points* are calculated in the same manner as for the *prescribed entry services connection points*.

Table 7 Hypothetical connection point ASRRs (exit)

Exit service (connection point)	ORC (\$)	Attributable connection point cost share	Connection point ASRR (\$)
Load A1	4,000,000	0.40	320,000
Load A2	800,000	0.08	64,000
Load B1	3,500,000	0.35	280,000
Load B2	1,700,000	0.17	136,000
Total	10,000,000	1.00	800,000

6.9.3 Prescribed transmission use of system (TUOS) services

The *prescribed TUOS* (shared network) services *ASRR* is recovered from:

- *prescribed TUOS services* (locational component); and
- *prescribed TUOS services* (the adjusted non-locational component).

Clause 6A.23.3(c)(1) of the *Rules* requires that:

“a share of the *ASRR* (the locational component) is to be adjusted by subtracting the estimated *auction amounts* expected to be distributed to the *Transmission Network Services Provider* under clause 3.18.4 from the *connection points* for each relevant *directional interconnector* and this adjusted share is to be allocated as between such *connection points* on the basis of the estimated proportionate use of the relevant *transmission system assets* by each of those customers, and the *CRNP methodology* and *modified CRNP methodology* represent two permitted means of estimating proportionate use”.

Basslink is the only *interconnector* between Tasmania and the rest of the *NEM*. As Basslink is a *market network service provider (MNSP)*, there is no requirement for Transend to make allowance

for the estimated *inter-regional settlements residue auction amounts* as outlined in clause 6A.23.3(c)(1) of the *Rules*.

Clause 6A.23.3(d) requires that 50 per cent of the *ASRR* for *prescribed TUOS services* is to be allocated initially to each of the locational and non-locational components, unless different allocation shares can be justified. Transend will use the prescribed 50 per cent shares, in line with Transend's previous practices.³

The adjusted share of the *ASRR* is allocated between *connection points* on the basis of the estimated proportionate use of the relevant *transmission system* assets by each customer using the *modified CRNP methodology*. Transend has previously employed the *modified CRNP* because of the highly radialised nature of the *transmission system* in Tasmania and proposes to continue to apply the *modified CRNP* as described in section 6.10.

The *CRNP methodology* allocates a proportion of shared network costs to individual customer *connection points*. Transend applies the *modified CRNP methodology* using the *TPRICE cost reflective network pricing* software approved by the AER for use by *TNSPs* in the *NEM*.

Appendix C describes the *CRNP methodology* in more detail.

The remainder of the *ASRR* (the pre-adjusted non-locational component) is to be adjusted:

- by subtracting or adding any *settlements residue* due to *intra-regional loss factors* which is expected to be distributed or recovered (as the case may be) to or from the *TNSP* in accordance with clause 3.6.5(a) of the *Rules*;⁴
- for any *over-recovery amount* or *under-recovery amount* that has not previously been recovered;
- for any amount arising as a result of the application of the *modified CRNP methodology* rather than the *CRNP methodology* (see section 6.10);
- for any amount arising as a result of the application of clause 6A.23.4(h) and (i) of the *Rules* (which detail adjustments so that prices for recovering the locational component of the *ASRR* for the provision of *prescribed TUOS services* do not change by more than 2 percentage points per annum compared to the load weighted average price for this component for the relevant *region*); and
- for any amount arising as a result of the application of prudent discounts in accordance with clause 6A.26.1(d)-(g) of the *Rules*.

6.10 Modified cost reflective network pricing methodology

The modification of the standard *CRNP* process employed by Transend is to discount the charges to be recovered from radial *transmission lines* by the utilisation of those lines. For example, if the *CRNP methodology* suggests that Transend should recover \$1 million from a particular radial line that has a utilisation factor of 60 per cent, then only \$0.6 million is recovered from *connection points* relating to this line through the locational component of the *prescribed TUOS services ASRR*.

³ As noted in clause 6A.23.3(d) of the *Rules*, these 50 per cent shares are allocated to the locational and non-locational components prior to subsequent adjustments allowed by the *Rules* (see later in this section). Therefore, the actual share of the *ASRR* for *prescribed TUOS services* that is recovered from the locational component will be different to the 50 per cent share initially allocated to this component.

⁴ As noted previously, *Transend* does not receive any settlements residue auction proceeds as the *interconnection* between Tasmania and the rest of the *NEM* is a *MNSP*. However, *Transend* does receive payments from *AEMO* in relation to *settlements residue* amounts that arise due to Tasmania's *intra-regional loss factors*.

The modification applies to radial lines only and is not applied to those assets that are part of the meshed *transmission network*.

The reason for applying this modification is that it means that existing customers are not penalised for the low utilisation of such assets and it provides potential customers with a financial incentive to locate where the utilisation rate is low, thereby enhancing overall utilisation of the *transmission system* and potentially deferring augmentation.

Consistent with section 2.2(b) of the *Pricing Methodology Guidelines*, the output of the TPRICE software is a “lump sum dollar amount to be recovered at each *transmission connection point*”.⁵ Using the modified *CRNP* will mean that the aggregate value of these lump sum dollar amounts is less than the 50 per cent allocation of the *ASRR* for *prescribed TUOS services* that was to be allocated through locational component. Any part of the *ASRR* for the locational component that is not allocated due to application of the modified *CRNP* is added to the non-locational component. In the example above, \$0.4 million would not be allocated to *connection points* by virtue of the modified *CRNP*, so this amount is added to (and recovered via) the non-locational component.

6.11 Transmission prices and charges

The **fifth step** in the determination of *prescribed transmission prices* is the development of separate prices for each *category of prescribed transmission services*, being:

- *prescribed entry services*;
- *prescribed exit services*;
- *prescribed common transmission services*;
- *prescribed TUOS services* – locational component; and
- *prescribed TUOS services* – the adjusted non-locational component.

6.11.1 Prescribed entry and exit service

Prescribed entry services and *prescribed exit services* prices are calculated to recover the *prescribed entry* and *prescribed exit services ASRRs* from the *Network Users* who are served by the relevant *connection* assets.

The *prescribed entry services ASRR* is recovered as a fixed annual charge for each relevant *connection point*. The process to determine the *ASRR* for *prescribed entry services* for each individual *connection point* was determined in section 6.9.1. This amount will be recovered by a fixed dollar amount per month.

Similarly, the *prescribed exit services ASRR* is recovered as a fixed annual charge for each relevant *connection point*. The process to determine the *ASRR* for *prescribed exit services* for each individual *connection point* was determined in section 6.9.2. This amount will be recovered by a fixed dollar amount per month.

6.11.2 Prescribed TUOS services: locational component prices and charges

Consistent with the provisions of clause 2.2(c)(1) of the *pricing methodology guidelines*, locational prices will be determined on the basis of *contract agreed maximum demand*.

⁵ AER, *Final Decision, Electricity transmission network service providers, Pricing methodology guidelines*, 29 October 2007, p.6.

The *prescribed TUOS services* locational ASRR described in section 6.9.3 is priced on a *contract agreed maximum demand* basis (\$/MW/day), where the *contract agreed maximum demand* is specified in, and re-negotiated in accordance with, customer connection agreements.

The *modified CRNP methodology* outlined in S6A.3 of the *Rules* and detailed in this proposed *pricing methodology* describes the process for cost allocation for the locational component of *prescribed TUOS services*, which results in a lump sum dollar amount to be recovered at each *connection point*.

This lump sum dollar amount for each *connection point* is divided by the product of the number of days in the forthcoming financial year and the *contract agreed maximum demand* (prevailing at the time transmission prices are published) to calculate the locational price for each *connection point*⁶ and is expressed as \$/MW/day.

As provided for under clause 6A.23.4(f) of the *Rules*, *prescribed TUOS services* locational prices must not change by more than 2 percentage points per annum at *connection points* relative to the load weighted average *prescribed TUOS services* locational price for the *region*. The balance of any revenue shortfall or *over-recovery amount* resulting from these price caps is recovered or offset as appropriate by adjusting the *prescribed TUOS services* non-locational prices and charges.

As further provided for under clause 6A.23.4(g) of the *Rules*, the change specified above “may exceed 2 per cent per annum if, since the last prices were set:

- (1) the load at the connection point has materially changed;
- (2) in connection with that change, the Transmission Customer requested a renegotiation of its connection agreement with the Transmission Network Service Provider; and
- (3) the AER has approved the change of more than 2 per cent per annum.”

This provision sets the *prescribed TUOS services* locational price at a *connection point* with a material change in *load* on the same basis as a new *connection point*.

In the event that a *Transmission Customer* requests a material change in *contract agreed maximum demand* at an existing *connection point*, Transend may seek approval from the AER to set the *prescribed TUOS services* locational price as intended by clause 6A.23.4(g) of the *Rules*.

Prescribed TUOS services locational charges are determined for each *connection point* providing *prescribed TUOS services* by multiplying the *prescribed TUOS services* locational price by the *contract agreed maximum demand* (prevailing during the billing period concerned) for that *connection point*, determined in accordance with the customer's *connection agreement*, and multiplying this amount by the number of days in the billing period.

Any *over-recovery amount* or *under recovery amount* arising from variances between forecast *contract agreed maximum demands* and the *contract agreed maximum demands* used for calculating *prescribed TUOS services* locational charges will be addressed by way of an *under-recovery amount* or an *over-recovery amount* adjustment when calculating prices in future financial years.

6.11.2.1 Changes to contract agreed maximum demand

On the basis that customers' *contract agreed maximum demands* are used to determine prices and to calculate charges, any changes to a customer's *contract agreed maximum demand* will have repercussions on the recovery of the AARR. Further, a core tenet of pricing for *prescribed transmission services* is that a customer's current behaviour should only affect their locational charge, with all other charges effectively being fixed (or sunk costs). Therefore it is clear that

⁶ The *connection point* for the purposes of determining the *prescribed TUOS prices* and *prescribed TUOS charges* will be the agreed point (or points) of supply between Transend and the *transmission network user*.

customers should not be able to change their *contract agreed maximum demand* simply for the sake of reducing their charges.

If customers were permitted to reduce their *contract agreed maximum demand* during a financial year on a temporary basis, it would provide an incentive for customers with seasonal demands to alter their *contract agreed maximum demand* to match their demand. This would introduce an unnecessary element of complexity into the pricing calculations, as well as customer and asset management.

While the implications for pricing would be addressed through the existing under and over-recovery process, it would not overcome the principle outlined above that a customer's current behaviour should only affect their locational charge.

There would also be a further complication for sites providing connection services to more than one customer. In such situations, the cost of assets providing services to more than one customer are (typically) allocated according to the ratio of each customer's *contract agreed maximum demand*. In the situation where one customer reduces their *contract agreed maximum demand*, the other customer(s) at that site would face increased connection charges.

Transend proposes that a customer's connection agreement will specify the process required to adjust its *contract agreed maximum demand*. Any requests to reduce a customer's *contract agreed maximum demand* on a temporary basis (for example, for seasonal demands) will not result in any reduction during the prevailing *financial year* in any charges calculated using *contract agreed maximum demand*. However, any increases in *contract agreed maximum demand* or any decreases that are of a permanent nature will be applied immediately to the calculation of relevant charges.

6.11.3 Prescribed TUOS services: non-locational component prices and charges

Prices for recovery of the adjusted non-locational component of *prescribed TUOS services* are set on a *postage stamp basis* in accordance with clause 6A.23.4(j) of the *Rules*.

Consistent with the provisions of clause 2.3(c)(1) of the *pricing methodology guidelines* prices on a *postage stamp basis* are determined on the basis of *contract agreed maximum demand* or historical energy and calculated annually as follows.

Each *financial year* Transend will determine the following two prices to apply at every *connection point*:

- an energy based price that is a price per unit of historical metered energy or current metered energy at a *connection point* expressed as \$/MWh; and
- a *contract agreed maximum demand* price that is a price per unit of *contract agreed maximum demand* at a *connection point* expressed as \$/MW/month.

Either the energy based price or the *contract agreed maximum demand* price will apply at a *connection point* providing *prescribed TUOS services* except for those *connection points* where a *Transmission Customer* has negotiated reduced charges for the adjusted non-locational component of *prescribed TUOS services* in accordance with clause 6A.26.1 of the *Rules* (prudent discounts).

The energy based price and the *contract agreed maximum demand* price is determined so that:

- a *Transmission Customer* with a *load factor* in relation to its *connection point* equal to the median *load factor* for *connection points* with *Transmission Customers* connected to the *transmission network* in the *region* or *regions* is indifferent between the use of the energy based price and the *contract agreed maximum demand* price; and
- the total amount to be recovered by the adjusted non-locational component of *prescribed TUOS services* does not exceed the *ASRR* for this *category of prescribed transmission service*.

The energy based price or the *contract agreed maximum demand* price that applies for the adjusted non-locational component of *prescribed TUOS services* at a *connection point* will be the one which results in the lower estimated charge for that *prescribed transmission service*.

When applying the energy based price, the *prescribed TUOS services* non-locational component charge for a billing period is calculated for each *connection point* by:

- multiplying the energy based price by the metered energy offtake at that *connection point* in the corresponding billing period two years earlier (that is, *historical metered energy offtake*); or
- multiplying the energy based price by the metered energy offtake at that *connection point* in the same billing period (*current metered energy offtake*) if the *historical metered energy offtake* is unavailable; or
- multiplying the energy based price by the current metered energy offtake if the historical metered energy offtake is significantly different to the current metered energy offtake.

When applying the *contract agreed maximum demand* price, the *prescribed TUOS services* non-locational component charge for a billing period will be calculated for each *connection point* by multiplying the *contract agreed maximum demand* price by the *contract agreed maximum demand* for the *connection point* (prevailing during the billing period concerned).

Forecast *prescribed TUOS services* non-locational charges will be calculated using the *contract agreed maximum demand* prevailing at the time prices are determined, while the actual *contract agreed maximum demand*-based charges will be calculated using the *contract agreed maximum demand* prevailing during the billing period concerned.

Any *over-recovery amount* or *under-recovery amount* arising from variances between forecast *contract agreed maximum demands* and the *contract agreed maximum demands* used for calculating charges will be addressed by way of an *under-recovery amount* or *over-recovery amount* adjustment when calculating prices in future financial years.

6.11.4 Prescribed common service prices and charges

Prices for *prescribed common transmission services* are set on a *postage stamp basis* in accordance with clause 6A.23.4(d) of the *Rules*.

Consistent with the provisions of clause 2.3(c)(1) of the *pricing methodology guidelines postage stamped prices* will be determined on the basis of *contract agreed maximum demand* or historical energy and calculated in a manner identical to that described for *prescribed TUOS services* non-locational charges in the previous section.

In accordance with clause 6A.23.3(f) of the *Rules* the operating and maintenance costs expected to be incurred in the provision of *prescribed common transmission services*, which are deducted from the *maximum allowed revenue* to form the *AARR*, are added to the *ASRR* for *prescribed common transmission services* and recovered through *prescribed common transmission service prices and charges*.

6.12 Standby service arrangements

This provision addresses the situation where Transend has agreed to provide *prescribed transmission services* on a standby basis (such as to cover the *outage* of onsite generation).

If Transend agrees to provide a standby service the customer's *connection agreement* must specify the terms and conditions applying to the provision of this service.

The customer's *connection agreement* would be required to specify the *contract agreed maximum demand* required to be available to the customer under normal operating conditions and a greater demand that may be sought on a standby basis subject to the operational condition of the *transmission network* at the time the standby arrangements are requested. The *transmission network* would be planned and developed to satisfy the *contract agreed maximum demand* rather than the standby demand.

If standby services are included in a customer's connection agreement, the customer will pay *prescribed exit services charges* (if applicable), *prescribed TUOS services locational component charges*, *prescribed TUOS services non-locational component charges* and *prescribed common transmission services* based:

- on the *contract agreed maximum demand* under normal operating conditions; and
- the standby demand and/or actual *energy* consumption during times that the standby service is actually utilised for *energy* delivery to the customer.

For the avoidance of doubt,

- where a standby service arrangement has been agreed between Transend and the relevant customer, the customer's *connection agreement* must specify (amongst other things) a *contract agreed maximum demand* and the conditions under which an excess demand charge as detailed in section 6.13 will apply; and
- nothing in this section 6.12 obliges Transend to agree to provide a standby service arrangement requested by a customer.

6.13 Excess demand charge

A *contract agreed maximum demand* price can only be applied for the *postage-stamped* prices if the *Transmission Customer's* connection agreement or other enforceable instrument governing the terms of connection of the *Transmission Customer*:

- nominates a *contract agreed maximum demand* for the *connection point*; and
- specifies penalties for exceeding the *contract agreed maximum demand*.

If in any month the 30 minute *billing demand*⁷ at a *connection point* exceeds the *contract agreed maximum demand* for that *connection point* without the prior approval of Transend, then the *Transmission Customer* will be liable to pay an excess active demand charge.

The excess active demand charge will be set at three times the *prescribed TUOS services locational component price* for the relevant *connection point* multiplied by the amount by which the billing demand exceeds the *contract agreed maximum demand*.

For the avoidance of doubt, it should be noted that the excess active demand charge is levied in addition to the *prescribed TUOS services locational component charge*. Monies recovered through the excess active demand charge is treated as revenue from *prescribed transmission services* and therefore included in Transend's *maximum allowed revenue*.

⁷ Billing demand is the greater of a *Transmission Customer's* 30 minute *maximum demand* and that customer's 30 minute maximum *apparent power* (in MVA) multiplied by their minimum *Rules-required power factor*.

6.14 Setting of prescribed TUOS services locational prices between annual price publications

In the event that Transend is required to set a *prescribed TUOS services* locational price at a new *connection point* or at a *connection point* where the load has changed significantly after *prescribed TUOS service* locational prices have been determined and published, an interim price, not subject to the side constraints of clause 6A.23.4(f) of the *Rules*, will be determined. This will be calculated using the prevailing pricing models with demands estimated in a manner consistent with clause 2.2(f) of the *pricing methodology guidelines*.

A price subject to the side constraints of clause 6A.23.4(f) of the *Rules* will be determined and published at the next annual price determination.

7 Billing arrangements

7.1 Billing for prescribed transmission services

Consistent with clause 6A.27.1 of the *Rules*, Transend will calculate the *transmission service* charges payable by *Transmission Network Users* for each *connection point* in accordance with the *transmission service* prices published under clause 6A.24.2 of the *Rules*.

Where charges are determined for *prescribed transmission services* from *metering data*, these charges will be based on kW or kWh obtained from the *metering data* managed by AEMO.

Transend will issue invoices to *Transmission Network Users* for *prescribed transmission services* which satisfy or exceed the minimum information requirements specified in clause 6A.27.2 of the *Rules* on a monthly basis or as specified in the customer's connection agreement.

Consistent with clause 6A.27.3 of the *Rules* a *Transmission Network User* must pay charges for *prescribed transmission services* properly charged to it and billed in accordance with this proposed *pricing methodology* by the date specified on the invoice.

7.2 Payments between Transmission Network Service Providers

If another *TNSP* is granted a Transmission Authority and is registered as a *Transmission Network Service Provider* by AEMO in the Tasmanian region, consistent with Rule 6A.27.4, one *TNSP* will become the *Co-ordinating Network Service Provider* under Rule 6A.29.1. The *TNSPs* will pay to each other relevant *TNSP* the revenue which is estimated to be collected during the following year by the first provider as charges for *prescribed transmission services* for the use of transmission systems owned by those other *TNSPs*.

Such payments will be determined by the *Co-ordinating Network Service Provider* for the region.

Financial transfers payable under Rule 6A.27.4 will be paid in equal monthly instalments or as documented in revenue collection agreements negotiated between the parties.

8 Prudential requirements

8.1 Prudential requirements for prescribed transmission services

Consistent with clause 6A.28.1 of the *Rules*, Transend may require a *Transmission Network User* to establish *prudential requirements* for either or both *connection services* and *transmission use of system services*. These *prudential requirements* may take the form of, but need not be limited to, capital contributions, pre-payments or financial guarantees.

The requirements for such *prudential requirements* will be negotiated between the parties and specified in the applicable transmission *connection agreement*.

8.2 Capital contribution or prepayment for a specific asset

Consistent with clause 6A.28.2 of the *Rules*, where Transend is required to construct or acquire specific assets to provide *prescribed connection services* or *prescribed TUOS services* to a *Transmission Network User*, Transend may require that *Transmission Network User* to make a capital contribution or prepayment for all or part of the cost of the new assets installed.

In the event that a capital contribution is required, any contribution made will be taken into account in the determination of *prescribed transmission service* prices applicable to that *Transmission Network User* by way of a proportionate reduction in the ORC of the asset(s) used for the allocation of *prescribed transmission service charges* or as negotiated between the parties.

In the event that a prepayment is required, any prepayment made will be taken into account in the determination of *prescribed transmission service* prices applicable to that *Transmission Network User* in a manner to be negotiated between the parties.

The treatment of such capital contributions or prepayments for the purposes of a *revenue determination* will, in all cases, be in accordance with the relevant provisions of the *Rules*.

9 Prudent discounts

Transend may, but is not required to, agree with a *Transmission Customer* to charge lower prices for the non-locational component of *prescribed TUOS services* and *prescribed common transmission services* provided to that *Transmission Customer*, than the prices determined in accordance with this proposed *pricing methodology*.

Transend notes that none of its *Transmission Customers* currently receive prudent discounts as at the date of this proposed *pricing methodology*.

In the event that a *Transmission Customer* does receive prudent discounts in the future, Transend will, in accordance with clause 6A.26.1(d)-(g) of the *Rules*, adjust the adjusted non-locational component of *prescribed TUOS services* and the *prescribed common transmission services* prices and charges to other customers for the amount of any anticipated *under-recovery amount* arising from prudent discounts applied.

10 Monitoring and compliance

As a regulated business, Transend is required to maintain extensive compliance monitoring and reporting systems to ensure compliance with its Transmission Licence, *revenue determination*, the *Rules* together with numerous other legislative obligations.

In order to monitor and maintain records of its compliance with its approved *pricing methodology*, the *Pricing Principles for Prescribed Transmission Services*, and Part J of the *Rules*, Transend proposes to:

- maintain the specific obligations arising from Part J of the *Rules* in its compliance management system;
- maintain electronic records of the annual calculation of *prescribed transmission service* prices and supporting information; and
- periodically subject its transmission pricing models and processes to functional audit by suitably qualified persons.

11 Additional information requirements

A number of additional information requirements arise from the *pricing methodology guidelines* which have not been covered elsewhere in this proposed *pricing methodology*. In order to satisfy these requirements Transend notes that it does not:

- consider transitional arrangements are necessary as a result of the implementation of the proposed *pricing methodology*;
- have any applicable relevant *derogations* in accordance with chapter 9 of the *Rules*; or
- have any applicable transitional arrangements arising from chapter 11 of the *Rules*.

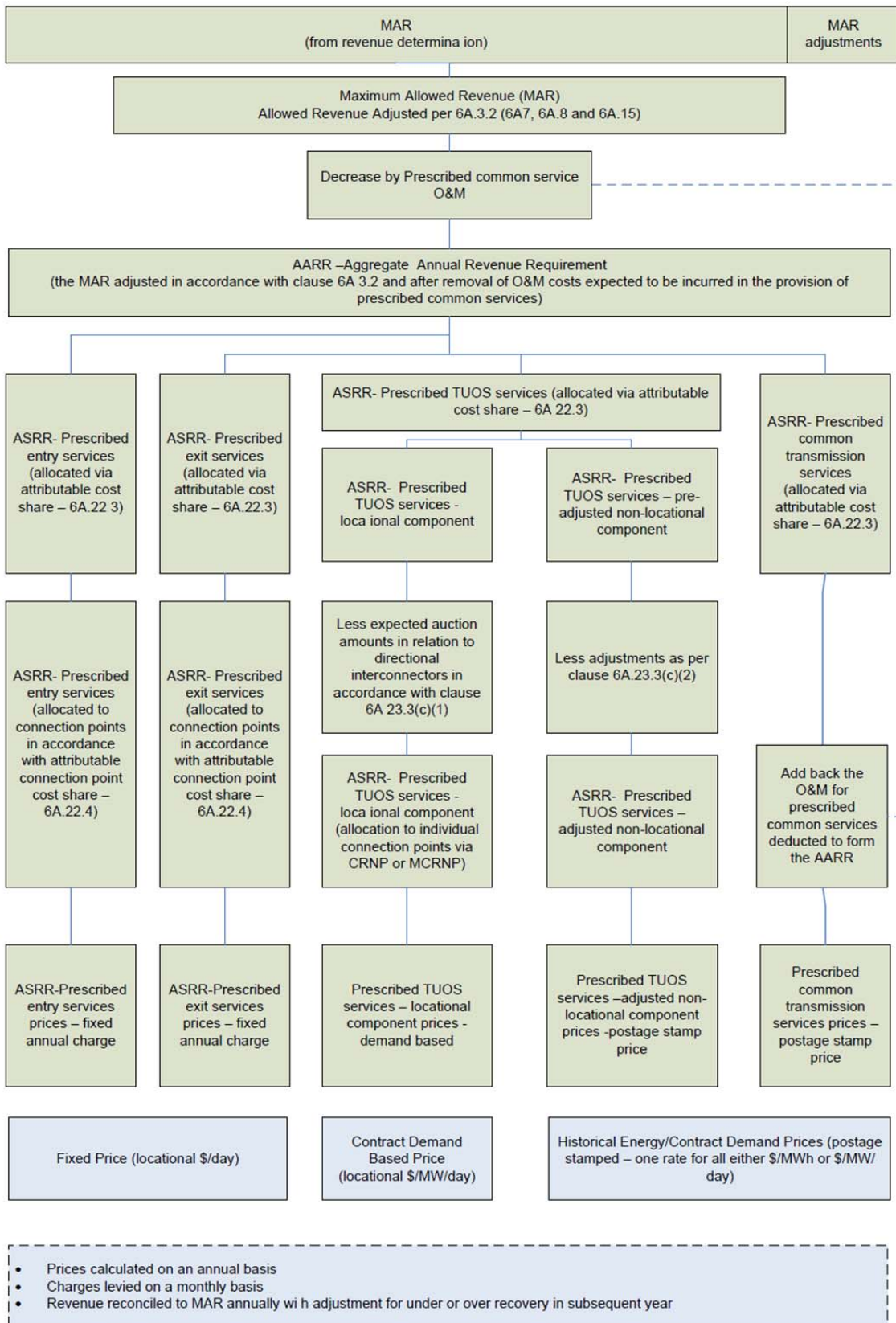
Transend has not provided a confidential version of this proposed *pricing methodology* to the *AER* in accordance with clause 2.5 of the *pricing methodology guidelines* and hence the provisions of clause 2.1(n) of the *pricing methodology guidelines* are not applicable.

12 Conclusion

Transend's proposed *pricing methodology* for the *regulatory control period* from 1 July 2015 to 30 June 2019 has been submitted to the *AER* in accordance with the requirements of chapter 6A of the *Rules* and the *pricing methodology guidelines*.

Appendix A: Overview of pricing process

Figure 1 Overview of pricing process



Appendix B: Details of cost allocation process

A cost allocation process is used to assign the optimised replacement cost (ORC)⁸ of all *prescribed transmission service* assets to each *category of prescribed transmission services* in a manner consistent with Section 2.4 of the *pricing methodology guidelines*.

The cost allocation process is summarised as follows:

Step 1: Initial cost allocation

Assets and their ORCs are assigned to one of the following primary asset categories:

- transmission lines;
- transformers;
- circuit breakers;
- common service assets (such as communications, reactive support, office buildings.); and
- substation local assets (ancillary equipment, civil work, and establishment).

The following plant items are not separately identified in the ORC database and are incorporated into the ORC of the associated primary items above:

- bus work.

Step 2: Allocation to categories of transmission services

Assets are allocated to the categories of *prescribed transmission services* in accordance with the provisions of section 2.4 of the *pricing methodology guidelines*. In the case of a shared connection asset, such as a transformer, serving multiple connection points which may provide both prescribed entry services and prescribed exit services, the cost of the shared connection asset will be allocated to the appropriate category or categories of prescribed transmission services using an appropriate cost allocator. For example:

- *Generation* or reactive plant nameplate rating capacity or agreed maximum demand (AMD) supplied by the specified transmission category of *prescribed transmission services* as a percentage of the total capacity and demand of all categories of *prescribed transmission services* at that location: costs are attributable based on the capacity and/or AMD agreed upon by the customer(s);
- unit of plant method: costs are allocated based on the number of units of plant installed (typically circuit breakers) where these units of plant can be attributed to a particular category of *prescribed transmission service*; or
- as negotiated between the connecting parties.

This process would also be adopted to allocate shared costs to individual connection points.

Step 3: Priority ordering

In the case of those costs which would be attributable to more than one category of *prescribed transmission services*, costs will be allocated in accordance with the provisions of clause 6A.23.2(d) of the *Rules*, having regard to the *stand-alone amount* costs associated with the provision of *prescribed TUOS services and prescribed common transmission services*, with the remainder being

⁸ Transend uses the optimised replacement cost of its assets sourced from its statutory financial accounts. If these values are not available, Transend will maintain an optimised replacement model of the *transmission network* to determine the appropriate optimised replacement cost of assets.

allocated to *prescribed entry services* and/or *prescribed exit services*. The implementation of the priority ordering process is detailed in Appendix D.

Conclusion

The shared network costs resulting from the cost allocation process are used as input to TPRICE, the *cost reflective network pricing* software that is approved by the AER for use by TNSPs in the NEM.

The *entry cost*, *exit cost* and *common service* costs are used as input to the calculation of *prescribed entry services* prices, *prescribed exit services* prices and *prescribed common transmission services* prices.

Appendix C: Cost reflective network pricing methodology

The *cost reflective network pricing methodology* (*CRNP methodology*) involves the following steps:

- determining the costs of the individual transmission network assets in the optimised *transmission network*;
- determining the proportion of each individual *network element* utilised in providing a *transmission service* to each point in the network for specified operating conditions;
- determining the maximum flow imposed on each *transmission element* by *load* at each *connection point*;
- allocating the costs attributed to the individual *transmission elements* to loads based on the proportionate use of the elements; and
- determining the total cost (lump sum) allocated to each point by adding the share of the costs of each individual *network element* attributed to each point in the network.

Allocation of generation to load

A major assumption in the use of the *CRNP methodology* is the definition of the *generation* source and the point where *load* is taken. The approach is to use the “electrical distance” to pair *generation* to *load*, in which a greater proportion of *load* at a particular location is supplied by *Generators* that are electrically closer than those that are electrically remote. In electrical engineering terminology the “electrical distance” is the impedance between the two locations, and this can readily be determined through a standard engineering calculation called the “fault level calculation”.

Once the assumption has been made as to the *Generators* that are supplying each load for a particular *load* and *generation* condition (time of day) it is possible to trace the flow through the *network* that results from supplying each *load* (or *Generator*). The use made of any element by a particular *load* is the ratio of the flow on the element resulting from the supply to this *load* to the total use of the *load* made by all *loads* and *Generators* in the *power system*.

Operating conditions for cost allocation

The choice of operating conditions is important in developing prices using the *CRNP methodology* or *modified CRNP methodology*. Transend has flexibility in the choice of operating conditions but notes that the NER previously set out the principles that applied in determining the sample of operating conditions considered. Of particular note was the requirement that the operating conditions to be used were to include at least 10 days with high system demand, to ensure that loading conditions, which impose peak flows on all *transmission elements*, were captured.

Clause S6A.3.2(3) of the *Rules* is less prescriptive, requiring that the allocation of dispatched generation to loads be over a range of actual operating conditions from the previous financial year and that the range of operating scenarios is chosen so as to include the conditions that result in most stress on the *transmission network* and for which *network investment* may be contemplated.

In selecting those operating scenarios it is important to recognise that the operating conditions that impose most stress on particular elements may occur at times other than for system peak demand.

Load and generation data

Clause 2.2(a) of the *pricing methodology guidelines* requires that prices for the recovery of the locational component of *prescribed TUOS services* are based on demand at times of greatest utilisation of the transmission network and for which network investment is most likely to be contemplated, in accordance with clause 6A.23.4(e) of the *Rules*.

The use made of the *network* by particular *loads* and *generators* will vary considerably depending on the *load* and *generation* conditions on the *network*. For this reason Transend uses the full year of operating data (that is, either 365 or 366 days of half hourly data) as an appropriate set of operating conditions. The TPRICE capacity method of cost allocation (used by Transend) automatically captures the peak loading conditions on *network* elements from the sample of operating conditions analysed.

Consistent with clause 2.2(f) of the *pricing methodology guidelines*, where actual operating conditions from the previous complete *financial year* are unavailable for a connection point, as would be the case for a new connection point, an estimate based on the contract agreed maximum demand and other characteristics of the load would be used to allocate costs to that *connection point*.

Appendix D: Priority Ordering Methodology

Rules requirements

Clause 6A.23.2 (d) of the *Rules* requires that:

“Where, as a result of the application of the *attributable cost share*, a portion of the *AARR* would be attributable to more than one category of *prescribed transmission services*, that *attributable cost share* is to be adjusted and applied such that any costs of a transmission system asset that would otherwise be attributed to the provision of more than one category of *prescribed transmission services*, is allocated as follows:

- (1) to the provision of prescribed TUOS services, but only to the extent of the stand-alone amount for that category of prescribed transmission services;
- (2) if any portion of the costs of a transmission system asset is not allocated to prescribed TUOS services, under subparagraph (1), that portion is to be allocated to prescribed common transmission services, but only to the extent of the stand-alone amount for that category of prescribed transmission services; and
- (3) if any portion of the costs of a transmission system asset is not attributed to prescribed transmission services under subparagraphs (1) and (2), that portion is to be attributed to prescribed entry services and prescribed exit services.”

Stand-alone amount is defined as:

“For a category of *prescribed transmission services*, the costs of a *transmission system* asset that would have been incurred had that *transmission system* asset been developed, exclusively to provide that category of *prescribed transmission services*.”

Clause 11.6.11(c) of the *Rules* states the following:

“For the purposes of new Chapter 6A:

- (1) the costs of the *transmission system* assets that from time to time may be treated as:
 - (i) directly attributable to the provision of a prescribed connection service; or
 - (ii) incurred in providing a prescribed connection service,

to a *Transmission Network User* or a group of *Transmission Network Users* at a *transmission network connection point* is limited to the costs of the eligible assets which, from time to time, provide that prescribed connection service;

- (2) any costs of an existing asset or a replacement asset (or of any portion of an existing asset or a replacement asset) that:
 - (i) is not an eligible asset (other than as a result of clause 11.6.11(d)); and
 - (ii) is used by a *Transmission Network Service Provider* to provide connection services to a *Transmission Network User* or a group of *Transmission Network Users* at a *transmission network connection point*,

must be treated as costs that are directly attributable to the provision of, or are incurred in providing, *prescribed TUOS services* and, to avoid doubt, the services provided by those assets which would otherwise be *connection services* are taken to be *prescribed TUOS services*; and

- (3) the *stand-alone amount* for *prescribed TUOS services* is taken to include any portion of the costs referred to in clause 11.6.11(c)(2) that has not been allocated under clause 6A.23.2(d)(1).”

This provision effectively introduces a fourth step to the priority ordering requirement.

Objective and general approach

The allocation methodology relies on the assumption that substation infrastructure and establishment costs are proportionate to the number of *high-voltage* circuit breakers in the *substation*.

Based on this assumption the appropriate allocator for substation infrastructure and establishment costs for a stand-alone arrangement is the ratio of the number of *high voltage* circuit breakers⁹ in the stand-alone arrangement to the number of *high voltage* circuit breakers in the whole *substation*.

Proposed methodology

As illustrated by the diagrams below, a “branch” is a collection of assets (for example, *transmission lines*, circuit breakers, capacitors, buses and *transformers*) that provide a *transmission service*.

Figure 2 Branch with transmission line, bus and circuit breaker

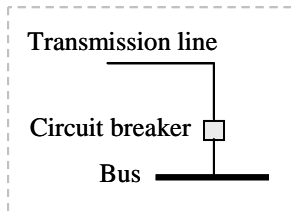


Figure 3 Branch with transformer, circuit breaker and two busses

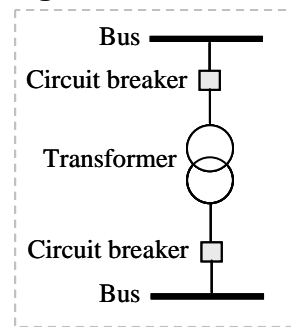
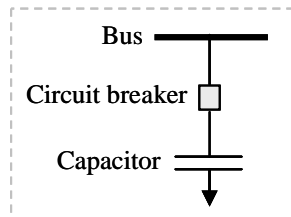


Figure 4 Branch with capacitor, circuit breaker and bus



Step 1: Branch identification

Identify the branches – being the *transmission lines*, *transformers*, major reactive devices and exits/entries in the *substation* which provide *prescribed TUOS services*, *prescribed common transmission services* and *prescribed entry services* or *prescribed exit services* – in the *substation*.

Step 2: Allocation of circuit breakers to branches

For each *high voltage* circuit breaker in the *substation*, identify the branches directly connected to it. Any circuit breaker that does not directly connect to a branch is excluded from allocation and all costs associated with it are added to the *substation* infrastructure and establishment cost.

Count the total number of circuit breakers directly connected to branches.

⁹ Low voltage circuit breakers are not considered in the stand-alone arrangements.

As a general rule, branches connecting *Distribution Network Service Providers (DNSPs)* are classified as *prescribed exit services* while branches connecting *generators* are classified as *prescribed entry service*. Assets providing *negotiated services* are not part of the regulatory asset base and fall outside the priority ordering process detailed in clause 6A.23.2(d) of the *Rules*.

Step 3: Determination of stand-alone arrangements

Step 3.1: Stand-alone arrangements for prescribed TUOS services

With reference to the number of *transmission lines* providing *prescribed TUOS services*, determine the number of circuit breakers required to provide *TUOS services* of an equivalent standard on a stand-alone basis. Transend understands the stand-alone configuration should be the simplest *substation* configuration (in the absence of development) had the *substation* been developed to provide only *prescribed TUOS services*. This may be done by way of a look up of typical stand-alone configurations.

Step 3.2: Stand-alone arrangements for prescribed common transmission services

With reference to the number of *transmission lines* providing *prescribed TUOS services* and devices providing *prescribed common transmission services*, determine the number of circuit breakers required to provide *prescribed common transmission services* of an equivalent standard on a stand-alone basis.¹⁰ Transend understands the stand-alone configuration to be the simplest *substation* configuration (in the absence of development) had the *substation* been developed to provide only *prescribed common transmission services*. This may be done by way of a look up of typical stand-alone configurations.

Step 4: Allocation of substation infrastructure and establishment costs

Step 4.1. Allocation to prescribed TUOS services

Allocate a portion of the *substation* infrastructure and establishment costs to *prescribed TUOS services* according to the ratio of the *high voltage* circuit breakers identified in step 3.1 to the total number of *high voltage* circuit breakers connected to branches in the *substation* identified in step 2.

Step 4.2 Calculate the unallocated substation infrastructure costs after TUOS allocation

Calculate the unallocated *substation* infrastructure cost by subtracting the amount calculated in step 4.1 from the total *substation* infrastructure amount. If the unallocated *substation* infrastructure cost is zero (that is, the *prescribed TUOS services* component of the *substation* infrastructure costs equals the total *substation* infrastructure amount), then no *substation* infrastructure costs would be allocated to *prescribed common transmission services*, *prescribed entry services* or *prescribed exit services*.

Step 4.3 Allocation to prescribed common transmission services

Allocate a portion of the *substation* infrastructure and establishment costs to *prescribed common transmission services* based on to the ratio of the *high voltage* circuit breakers providing *prescribed common transmission services* identified in step 3.2 to the total number of *high voltage* circuit breakers connected to branches in the *substation*. If the *common service* portion of substation infrastructure is greater than the unallocated costs calculated in step 4.2, then only the unallocated portion is attributed to *prescribed common transmission service*. In this instance, no *substation* infrastructure costs would be allocated to *prescribed entry services* or *prescribed exit services*.

¹⁰ The number of *transmission lines* providing *prescribed TUOS services* is included in determining the number of circuit breakers required to provide *prescribed common transmission services* on a stand-alone basis because the *common services* are provided to the entire *transmission network*, so they cannot be considered in isolation but must be connected to the *transmission network* through the *prescribed TUOS services*.

Step 4.4 Calculate the unallocated substation infrastructure costs after common service allocation

Re-calculate the unallocated *substation* infrastructure cost by subtracting the amount calculated in step 4.3 from the amount calculated in step 4.2. If the unallocated *substation* infrastructure cost is zero (that is, the *prescribed TUOS services* and *prescribed common transmission services* components of the *substation* infrastructure costs equals the total *substation* infrastructure amount), then no *substation* infrastructure costs would be allocated to *prescribed entry services* or *prescribed exit services*.

Step 4.5 Allocation of remaining costs

If any of the *substation* infrastructure and establishment costs have been allocated to *prescribed TUOS services* or *prescribed common transmission services* under steps 4.1 and 4.3 above, allocate the remaining costs (calculated in step 4.4) to *prescribed TUOS services*.¹¹ However, if none of the costs have been allocated to *prescribed TUOS services* or *prescribed common transmission services* under steps 4.1 or 4.3, allocate the remaining *substation* infrastructure and establishment costs (calculated in step 4.4) to each branch providing *prescribed entry services* or *prescribed exit services*. This allocation will be based on the ratio of the *high voltage* circuit breakers providing the *prescribed entry services* or *prescribed exit services* to the total number of *high voltage* circuit breakers, or in accordance with Transend's cost allocation methodology as appropriate.¹²

Notes on process

The following points should be noted:

- costs are only allocated in step 4 until fully allocated;
- consistent with clause 6A.23(d)(3) of the *Rules*, it is possible that no costs will be attributed to entry and exit services;
- new and existing *negotiated service* assets are excluded from the analysis as any incremental establishment costs associated with such assets are taken to be included in the *negotiated services* charges on a causation basis; and
- the assessment of stand-alone arrangements only needs to be conducted once per *substation* except where changes to the configuration of the *substation* occur.

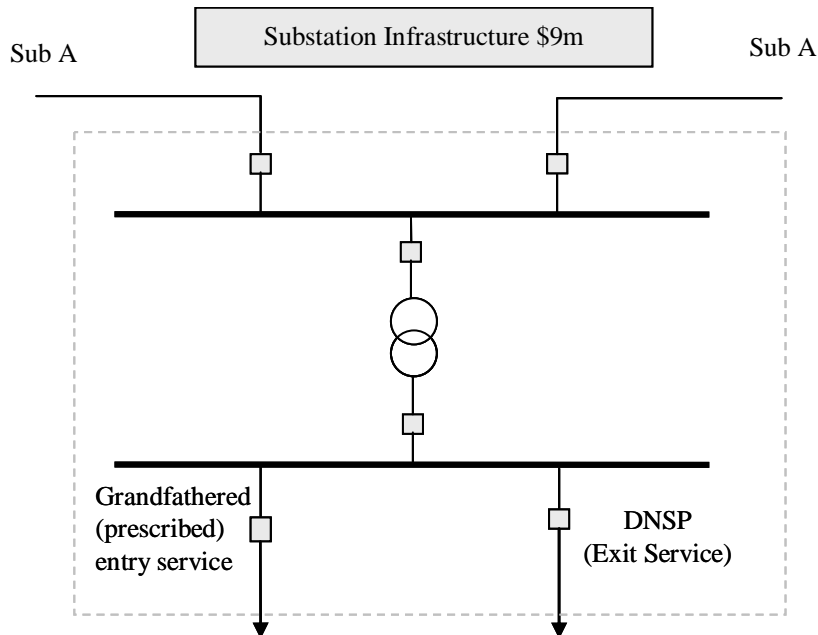
¹¹ See clause 11.6.11(c) of the *Rules*.

¹² The allocation between (or within) *prescribed entry services* or *prescribed exit services* is not included in the priority ordering process as it was not considered in clause 6A.23.3(d)(3) of the *Rules*.

Examples of application of priority ordering process

Example A

Figure 5 Substation configuration: example A



Step 1: The branches are two *transmission lines* to Sub A, a *prescribed exit service* to a *DNSP*, and a *prescribed entry service* to a *Generator* that is grandfathered under clause 11.6.11 of the *Rules*.¹³

Step 2: The total number of circuit breakers directly connected to branches is 6.

Step 3.1: No *prescribed TUOS services* are provided at this site.

Step 3.2: No *prescribed common transmission services* are provided at this site.

Step 4: Assume the total infrastructure cost that can be allocated to more than one *category of prescribed transmission service* is \$9 million.

Step 4.1: Costs are allocated to *prescribed TUOS services* in the ratio of the number of circuit breakers in the stand-alone arrangement to the total number of circuit breakers. Therefore, the infrastructure cost allocated to *TUOS* = $(0/6) \times \$9\text{m} = \0m

Step 4.2: Unallocated = $\$9\text{m} - \$0\text{m} = \$9\text{m}$

Step 4.3: Costs are allocated to *prescribed common transmission service* in the ratio of the number of circuit breakers in the stand-alone arrangement to the total number of circuit breakers. Therefore, the infrastructure cost allocated to *common service* = $(0/6) \times \$9\text{m} = \0m

¹³ With the exception of Example A, these examples do not include reference to any *prescribed entry services* for two reasons (i) for the sake of simplicity and (ii) because the impact of a *prescribed entry service* is the same as for a *prescribed exit service*. Therefore, references in the examples to *prescribed exit service* are interchangeable with references to *prescribed entry services*. This interchangeability between *prescribed entry services* and *prescribed exit service* for the purpose of cost allocation under priority ordering is the reason that the table in each example includes reference to “Costs to entry and exit” even though the relevant example may only include *prescribed exit services*.

Furthermore, in a situation where there is more than one *prescribed entry services* and/or *prescribed exit service*, such as those shown in Examples A or E, the allocation of costs between the *prescribed entry services* and/or *prescribed exit service* is described in step 3 of Appendix B.

Step 4.4: Unallocated = \$9m – \$0m = \$9m

Step 4.5: As none of the infrastructure cost has been allocated in the preceding steps, the remaining (unallocated) cost is allocated to *prescribed entry services* and *prescribed exit services*. Therefore, the infrastructure cost allocated to *prescribed entry services* and *prescribed exit services* = \$9m

Table 8 Priority ordering allocation: example A

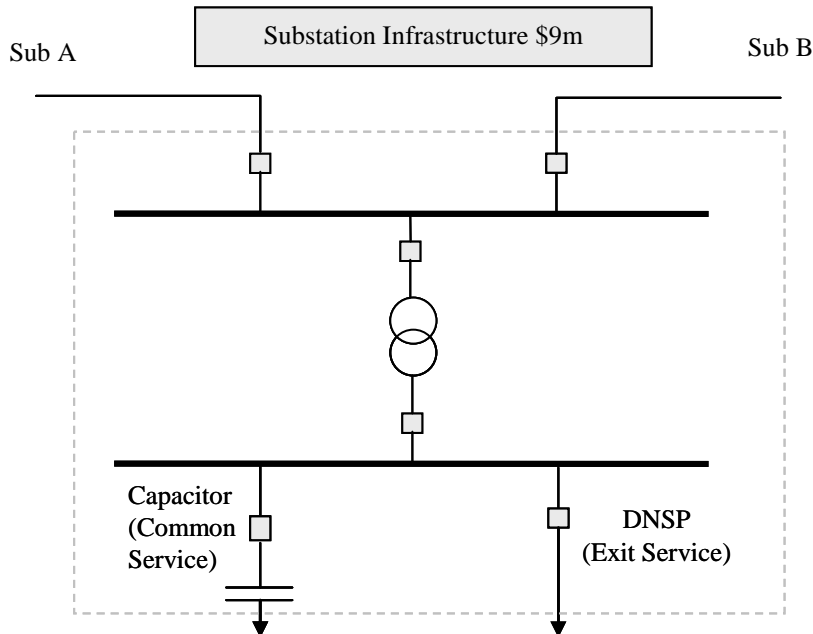
		Allocated	Yet to be allocated
Substation infrastructure costs			9,000,000
Total breakers	6		
TUOS stand-alone breakers	0		
Costs to TUOS	0	0	9,000,000
Common service stand-alone breakers	0		
Costs to common service	0	0	9,000,000
Costs to entry and exit		9,000,000	0
TOTAL		9,000,000	0

Table 9 Summary of cost allocation: example A

	Allocated
Costs allocated to TUOS	0
Costs allocated to common service	0
Costs allocated to entry and exit	9,000,000
TOTAL	9,000,000

Example B

Figure 6 Substation configuration: example B



Step 1: The branches are *transmission lines* to Sub A and Sub B, a *prescribed exit service* to a DNSP, a *transformer* and a *capacitor*.

Step 2: The total number of circuit breakers directly connected to branches is 6.

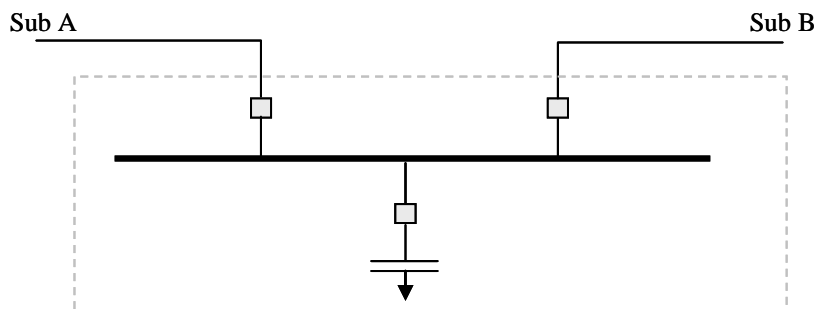
Step 3.1: The stand-alone arrangement for the provision of *prescribed TUOS services* to an equivalent standard is shown below and consists of 2 circuit breakers.

Figure 7 Stand-alone prescribed TUOS services: example B



Step 3.2: The stand-alone arrangement for the provision of *prescribed common transmission services* to an equivalent standard is shown below and consists of 3 circuit breakers.

Figure 8 Stand-alone prescribed common transmission services: example B



Step 4: Assume the total infrastructure cost that can be allocated to more than one *category of prescribed transmission service* is \$9 million.

Step 4.1: Costs are allocated to *prescribed TUOS services* in the ratio of the number of circuit breakers in the stand-alone arrangement to the total number of circuit breakers. Therefore, the infrastructure cost allocated to *TUOS* = $(2/6) \times \$9\text{m} = \3m

Step 4.2: Unallocated = $\$9\text{m} - \$3\text{m} = \$6\text{m}$

Step 4.3: Costs are allocated to *prescribed common transmission service* in the ratio of the number of circuit breakers in the stand-alone arrangement to the total number of circuit breakers. Therefore, the infrastructure cost allocated to *common service* = $(3/6) \times \$9\text{m} = \4.5m

Step 4.4: Unallocated = $\$6\text{m} - \$4.5\text{m} = \$1.5\text{m}$

Step 4.5: As part of the infrastructure cost has been allocated in the preceding steps, the remaining (unallocated) cost is allocated to *prescribed TUOS services*. Therefore, the total infrastructure cost allocated to *prescribed TUOS services* = $\$1.5\text{m} + \$3\text{m} = \$4.5\text{m}$

Table 10 Priority ordering allocation: example B

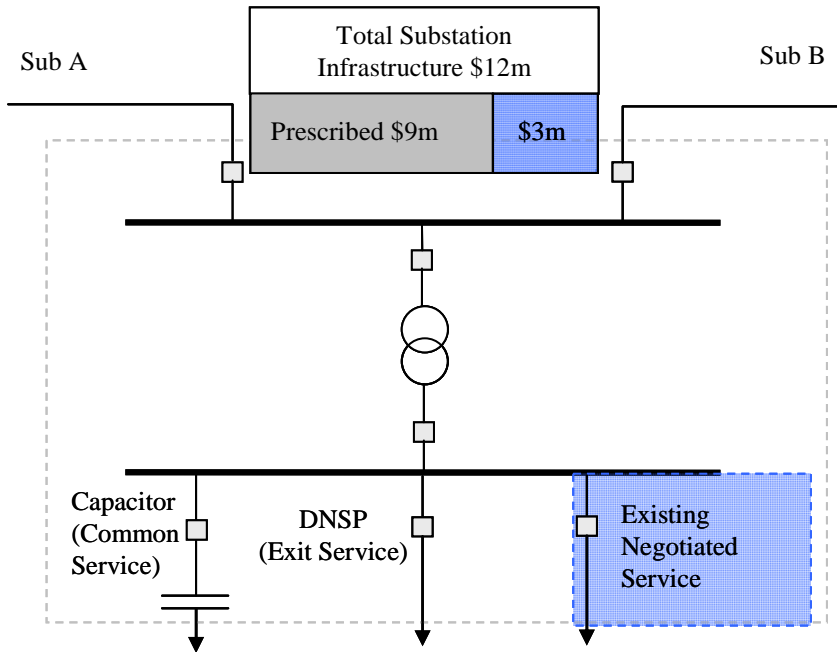
		Allocated	Yet to be allocated
Substation infrastructure costs			9,000,000
Total breakers	6		
TUOS stand-alone breakers	2		
Costs to TUOS	0.333	3,000,000	6,000,000
Common service stand-alone breakers	3		
Costs to common service	0.500	4,500,000	1,500,000
Costs to TUOS		1,500,000	0
TOTAL		9,000,000	0

Table 11 Summary of cost allocation: example B

	Allocated
Costs allocated to TUOS	4,500,000
Costs allocated to common service	4,500,000
Costs allocated to entry and exit	0
TOTAL	9,000,000

Example C

Figure 9 Substation configuration: example C

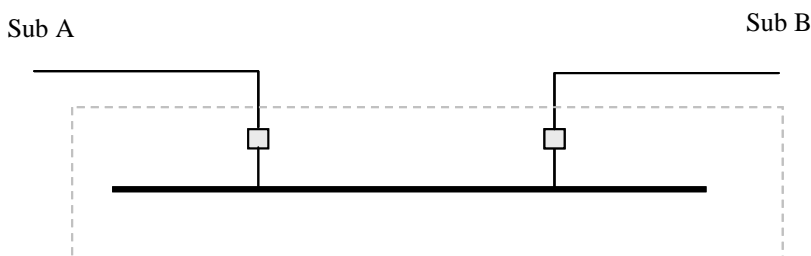


Step 1: The branches are *transmission lines* to Sub A and Sub B, a *prescribed exit service* to a DNSP, a *transformer*, a capacitor and an existing *negotiated service*.

Step 2: The total number of circuit breakers directly connected to branches is 6 (none of the costs for *prescribed transmission services* are allocated to the *negotiated service*).

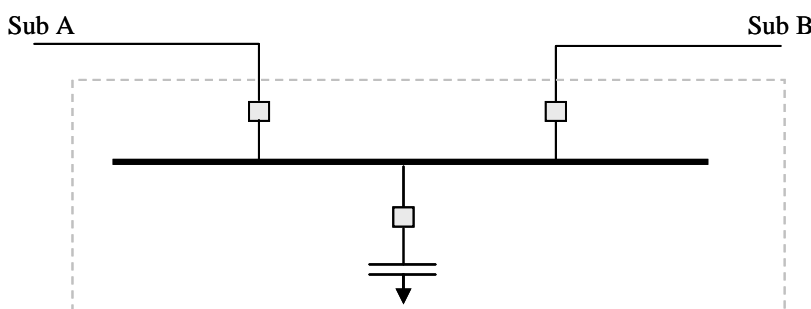
Step 3.1: The stand-alone arrangement for the provision of *prescribed TUOS services* to an equivalent standard is shown below and consists of 2 circuit breakers.

Figure 10 Stand-alone prescribed TUOS services: example C



Step 3.2: The stand-alone arrangement for the provision of *prescribed common transmission services* to an equivalent standard is shown below and consists of 3 circuit breakers.

Figure 11 Stand-alone prescribed common transmission services: example C



Step 4: Assume the total infrastructure cost is \$12m; \$3m of which is for the existing negotiated service, which does not form part of the regulatory asset base and is not governed by clause 6A.23.2(d) of the *Rules*. Therefore, the total infrastructure cost that can be allocated to more than one *category of prescribed transmission service* is \$9 million.

Step 4.1: Costs are allocated to *prescribed TUOS services* in the ratio of the number of circuit breakers in the stand-alone arrangement to the total number of circuit breakers. Therefore, the infrastructure cost allocated to *TUOS* = $(2/6) \times \$9m = \$3m$

Step 4.2: Unallocated = $\$9m - \$3m = \$6m$

Step 4.3: Costs are allocated to *prescribed common transmission service* in the ratio of the number of circuit breakers in the stand-alone arrangement to the total number of circuit breakers. Therefore, the infrastructure cost allocated to *common service* = $(3/6) \times \$9m = \$4.5m$

Step 4.4: Unallocated = $\$6m - \$4.5m = \$1.5m$

Step 4.5: As part of the infrastructure cost has been allocated in the preceding steps, the remaining (unallocated) cost is allocated to *prescribed TUOS services*. Therefore, the infrastructure cost allocated to *prescribed TUOS services* = $\$1.5m + \$3m = \$4.5m$

Table 12 Priority ordering allocation: example C

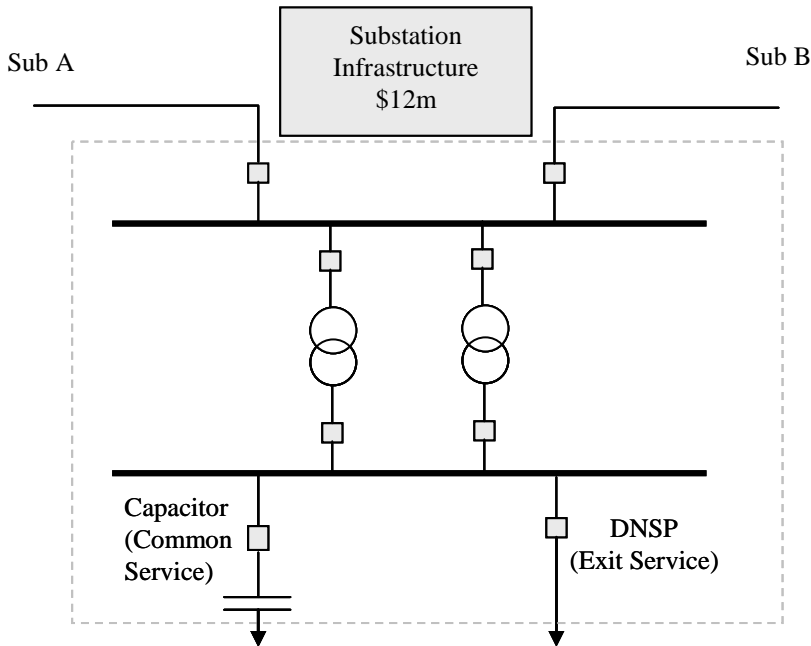
		Allocated	Yet to be allocated
Substation infrastructure costs			9,000,000
Total breakers	6		
TUOS stand-alone breakers	2		
Costs to TUOS	0.333	3,000,000	6,000,000
Common service stand-alone breakers	3		
Costs to common service	0.500	4,500,000	1,500,000
Costs to TUOS		1,500,000	0
TOTAL		9,000,000	0

Table 13 Summary of cost allocation: example C

	Allocated
Costs allocated to TUOS	4,500,000
Costs allocated to common service	4,500,000
Costs allocated to entry and exit	0
TOTAL	9,000,000

Example D

Figure 12 Substation configuration: example D



Step 1: The branches are *transmission lines* to Sub A and Sub B, a *prescribed exit service* to a DNISP, two *transformers* and a capacitor.

Step 2: The total number of circuit breakers directly connected to branches is 8.

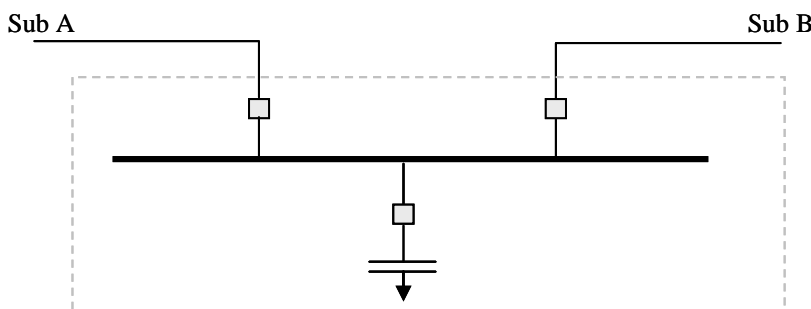
Step 3.1: The stand-alone arrangement for the provision of *prescribed TUOS services* to an equivalent standard is shown below and consists of 2 circuit breakers.

Figure 13 Stand-alone prescribed TUOS services: example D



Step 3.2: The stand-alone arrangement for the provision of *prescribed common transmission services* to an equivalent standard is shown below and consists of 3 circuit breakers.

Figure 14 Stand-alone prescribed common transmission services: example D



Step 4: Assume the total infrastructure cost that can be allocated to more than one *category of prescribed transmission service* is \$12 million.

Step 4.1: Costs are allocated to *prescribed TUOS services* in the ratio of the number of circuit breakers in the stand-alone arrangement to the total number of circuit breakers. Therefore, the infrastructure cost allocated to *TUOS* = $(2/8) \times \$12\text{m} = \3m

Step 4.2: Unallocated = $\$12\text{m} - \$3\text{m} = \$9\text{m}$

Step 4.3: Costs are allocated to *prescribed common transmission service* in the ratio of the number of circuit breakers in the stand-alone arrangement to the total number of circuit breakers. Therefore, the infrastructure cost allocated to *common service* = $(3/8) \times \$12\text{m} = \4.5m

Step 4.4: Unallocated = $\$9\text{m} - \$4.5\text{m} = \$4.5\text{m}$

Step 4.5: As part of the infrastructure cost has been allocated in the preceding steps, the remaining (unallocated) cost is allocated to *prescribed TUOS services*. Therefore, the infrastructure cost allocated to *prescribed TUOS services* = $\$4.5\text{m} + \$3\text{m} = \$7.5\text{m}$

Table 14 Priority ordering allocation: example D

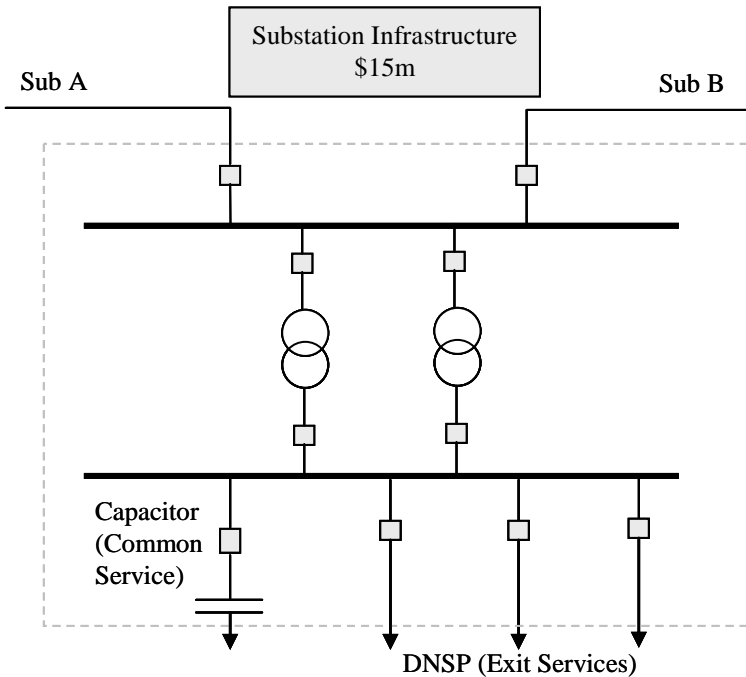
		Allocated	Yet to be allocated
Substation infrastructure costs			12,000,000
Total breakers	8		
TUOS stand-alone breakers	2		
Costs to TUOS	0.250	3,000,000	9,000,000
Common service stand-alone breakers	3		
Costs to common service	0.375	4,500,000	4,500,000
Costs to TUOS		4,500,000	0
TOTAL		12,000,000	0

Table 15 Summary of cost allocation: example D

	Allocated
Costs allocated to TUOS	7,500,000
Costs allocated to common service	4,500,000
Costs allocated to entry and exit	0
TOTAL	12,000,000

Example E

Figure 15 Substation configuration: example E



Step 1: The branches are *transmission lines* to Sub A and Sub B, *prescribed exit services* to DNSP(s), two *transformers* and a capacitor.

Step 2: The total number of circuit breakers directly connected to branches is 10.

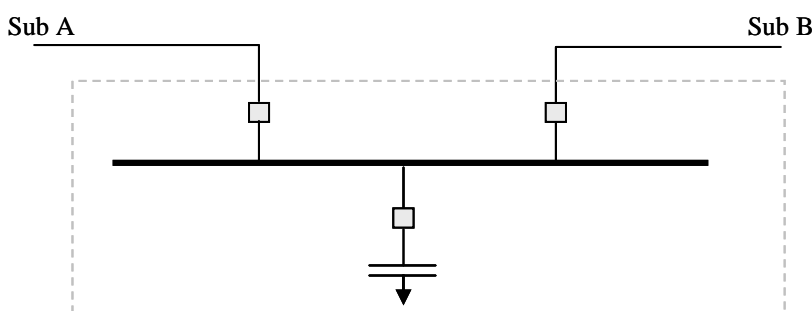
Step 3.1: The stand-alone arrangement for the provision of *prescribed TUOS services* to an equivalent standard is shown below and consists of 2 circuit breakers.

Figure 16 Stand-alone prescribed TUOS services: example E



Step 3.2: The stand-alone arrangement for the provision of *prescribed common transmission services* to an equivalent standard is shown below and consists of 3 circuit breakers.

Figure 17 Stand-alone prescribed common transmission services: example E



Step 4: Assume the total infrastructure cost that can be allocated to more than one *category of prescribed transmission service* is \$15 million.

Step 4.1: Costs are allocated to *prescribed TUOS services* in the ratio of the number of circuit breakers in the stand-alone arrangement to the total number of circuit breakers. Therefore, the infrastructure cost allocated to *TUOS* = $(2/10) \times \$15\text{m} = \3m

Step 4.2: Unallocated = $\$15\text{m} - \$3\text{m} = \$12\text{m}$

Step 4.3: Costs are allocated to *prescribed common transmission service* in the ratio of the number of circuit breakers in the stand-alone arrangement to the total number of circuit breakers. Therefore, the infrastructure cost allocated to *common service* = $(3/10) \times \$15\text{m} = \4.5m

Step 4.4: Unallocated = $\$12\text{m} - \$4.5\text{m} = \$7.5\text{m}$

Step 4.5: As part of the infrastructure cost has been allocated in the preceding steps, the remaining (unallocated) cost is allocated to *prescribed TUOS services*. Therefore, the infrastructure cost allocated to *prescribed TUOS services* = $\$7.5\text{m} + \$3\text{m} = \$10.5\text{m}$

Table 16 Priority ordering allocation: example E

		Allocated	Yet to be allocated
Substation infrastructure costs			15,000,000
Total breakers	10		
TUOS stand-alone breakers	2		
Costs to TUOS	0.200	3,000,000	12,000,000
Common service stand-alone breakers	3		
Costs to common service	0.300	4,500,000	7,500,000
Costs to TUOS		7,500,000	0
TOTAL		15,000,000	0

Table 17 Summary of cost allocation: example E

	Allocated
Costs allocated to TUOS	10,500,000
Costs allocated to common service	4,500,000
Costs allocated to entry and exit	0
TOTAL	15,000,000