



# **FINAL DECISION**

## **TransGrid transmission determination 2018 to 2023**

May 2018

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## Note

This document forms part of the AER's final decision on TransGrid's transmission determination for 2018–23. It should be read with all other parts of the final decision.

The final decision includes the following documents:

Overview

TransGrid transmission determination 2018–23

Attachment 1 – Maximum allowed revenue

Attachment 2 – Regulatory asset base

Attachment 5 – Regulatory depreciation

Attachment 6 – Capital expenditure

Attachment 8 – Corporate income tax

Attachment 9 – Efficiency benefit sharing scheme

Attachment 10 – Capital expenditure sharing scheme

Attachment A – Negotiating framework

Attachment B – Pricing methodology

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## Shortened forms

Shortened form	Extended form
AARR	aggregate annual revenue requirement
AEMC	Australian Energy Market Commission
AEMO	Australian Energy Market Operator
AER	Australian Energy Regulator
ASRR	annual service revenue requirement
augex	augmentation expenditure
capex	capital expenditure
CCP	Consumer Challenge Panel
CESS	capital expenditure sharing scheme
CPI	consumer price index
DMIA	demand management innovation allowance
DRP	debt risk premium
EBSS	efficiency benefit sharing scheme
ERP	equity risk premium
MAR	maximum allowed revenue
MRP	market risk premium
NEL	national electricity law
NEM	national electricity market
NEO	national electricity objective
NER	national electricity rules
NSP	network service provider
NTSC	negotiated transmission service criteria
opex	operating expenditure
PPI	partial performance indicators
PTRM	post-tax revenue model
RAB	regulatory asset base
RBA	Reserve Bank of Australia
repex	replacement expenditure
RFM	roll forward model
RIN	regulatory information notice

Shortened form	Extended form
RPP	revenue and pricing principles
SLCAPM	Sharpe-Lintner capital asset pricing model
STPIS	service target performance incentive scheme
TNSP	transmission network service provider
TUoS	transmission use of system
WACC	weighted average cost of capital

# Summary

The Australian Energy Regulator (AER) makes a transmission determination for each transmission network service provider (TNSP) in accordance with chapter 6A of the National Electricity Rules (NER).<sup>1</sup>

This document is our transmission determination for TransGrid for the regulatory control period 1 July 2018 to 30 June 2023. Our reasons are included in the AER's final decision on TransGrid's transmission determination (May 2018) which should be read in conjunction with this document.

Our transmission determination for TransGrid consists of:<sup>2</sup>

- A revenue determination in respect of the provision by TransGrid of prescribed transmission services (section 1)
- A determination relating to TransGrid's negotiating framework (section 2)
- A determination that specifies the negotiated transmission service criteria (NTSC) that apply to TransGrid (section 3)
- A determination that specifies the pricing methodology that applies to TransGrid (section 4)
- A determination that specifies pass through events that will apply to this determination in addition to those specified in the NER (section 5).

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<sup>1</sup> NER, cl. 6A.2.1.

<sup>2</sup> NER, cl. 6A.2.2; 6A.7.3(a1).

# 1 Revenue

We calculate the amount of revenue that TransGrid requires each year of the regulatory control period in accordance with a building block approach.<sup>3</sup> This is referred to as the *annual building block revenue requirement*. The annual building block revenue is then used to calculate the expected *maximum allowed revenue* (MAR) for each year of the 2018–23 regulatory control period. The annual MAR that TransGrid may earn from providing prescribed transmission services is subject to adjustments to account for factors such as inflation, approved pass through costs and annual performance rewards or penalties.

Our revenue determination specifies the following matters:<sup>4</sup>

- The amount of the estimated total revenue cap for the regulatory control period and the method of calculating that amount.
- The annual building block revenue requirement for each regulatory year of the regulatory control period.
- The amount of the MAR for each regulatory year of the regulatory control period or the method of calculating that amount.
- The regulatory asset base (RAB) as at the commencement of the regulatory control period.
- The methodology that will be used for the indexation of the RAB.
- The values that are to be attributed to the performance incentive scheme parameters for the purposes of the application to TransGrid of the service target performance incentive scheme (STPIS) that applies in respect of the regulatory control period.
- The values that are to be attributed to the efficiency benefit sharing scheme parameters for the purposes of the application to TransGrid of the efficiency benefit sharing scheme (EBSS) that applies in respect of the regulatory control period.
- How the capital expenditure sharing scheme is to apply to TransGrid.
- The commencement and length of the regulatory control period covered by this determination.
- That depreciation for establishing the regulatory asset base as at the commencement of the following regulatory control period is to be based on forecast capital expenditure.
- Annually updating the return on debt

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<sup>3</sup> NER, cl. 6A.5.4.

<sup>4</sup> NER, cl. 6A.4.2.

## 1.1 Method for calculating estimated total revenue cap

We determine an estimated total MAR of \$4015.1 million (\$nominal) for TransGrid for the 2018–23 regulatory control period as shown in Table 1-1. The estimated total MAR is also known as the total revenue cap. It is the sum of the expected MAR for each regulatory year.<sup>5</sup>

**Table 1-1 AER's final determination on TransGrid's annual expected maximum allowed revenue (\$ million, nominal)**

	2018–19	2019–20	2020–21	2021–22	2022–23	Total
Annual expected MAR (smoothed)	734.3	767.1	801.5	837.4	874.8	4015.1
X factor (%) <sup>a</sup>	n/a <sup>b</sup>	-1.98%	-1.98%	-1.98%	-1.98%	n/a

Source: AER analysis.

- (a) The X factors will be revised to reflect the annual return on debt update. Under the CPI-X framework, the X factor measures the real rate of change in annual expected revenue from one year to the next. A negative X factor represents a real increase in revenue. Conversely, a positive X factor represents a real decrease in revenue.
- (b) TransGrid is not required to apply an X factor for 2018–19 because we set the 2018–19 MAR in this transmission determination. The MAR for 2018–19 is around 0.5 per cent higher than the approved MAR for 2017–18 in real terms, or 3.0 per cent higher in nominal terms.

We determine the annual expected MAR by using the X factors to smooth the annual building block revenue requirement as set out below.

## 1.2 Annual building block revenue requirement

We determine the annual building block revenue requirement for TransGrid as shown in Table 1-2.

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<sup>5</sup> NER, cl. 6A.5.3.

**Table 1-2 AER's final determination on TransGrid's annual building block revenue requirement (\$ million, nominal)**

	2018–19	2019–20	2020–21	2021–22	2022–23	Total
Return on capital	416.8	424.8	435.2	445.4	458.2	2180.4
Regulatory depreciation	101.2	118.9	131.7	134.1	144.6	630.5
Operating expenditure	179.9	187.6	196.5	208.3	204.6	976.7
Revenue adjustments	4.7	18.5	5.4	12.7	5.1	46.5
Net tax allowance	31.7	33.7	35.3	37.3	39.1	177.1
<b>Annual building block revenue requirement (unsmoothed)</b>	<b>734.3</b>	<b>783.5</b>	<b>804.1</b>	<b>837.8</b>	<b>851.6</b>	<b>4011.3</b>

Source: AER analysis.

### 1.3 Method for calculating maximum allowed revenue

We use an expected inflation rate in our post-tax revenue model (PTRM) to calculate the expected MAR (as shown in Table 1-3) in nominal dollar terms. Therefore, the calculation of the actual annual MAR will require an adjustment for actual inflation. The MAR is also subject to adjustments for updating the return on debt annually, a revenue increment or decrement determined in accordance with the STPIS, and any approved pass through amounts. This section sets out the method of this annual adjustment process.

We determine that the method for calculating TransGrid's MAR for each year of the 2018–23 period will be the sum of its allowed revenue (AR) for that year and adjustments arising from the STPIS and any approved pass through amounts.

We determine the 2018–19 AR of \$734.3 million for TransGrid. TransGrid then applies an annual adjustment to determine its AR for each subsequent year of the 2018–23 period, based on the previous year's AR and using the CPI-X methodology. That is, the subsequent year's AR is determined by adjusting the previous year's AR for actual inflation and the X factor determined after the annual return on debt update:

$$AR_t = AR_{t-1} \times (1 + \Delta CPI) \times (1 - X_t)$$

where:

AR = the allowed revenue

t = time period/financial year (for t = 2 (2019–20), 3 (2020–21), 4 (2021–22), 5 (2022–23))

ΔCPI = the annual percentage change in the Australian Bureau of

Statistics' (ABS) consumer price index (CPI) all groups, weighted average of eight capital cities from December in year  $t - 2$  to December in year  $t - 1$

X = the smoothing factor determined in accordance with the PTRM as approved in the AER's final decision, and annually revised for the return on debt update in accordance with the formula specified in section 1.11 calculated for the relevant year.

The MAR is determined annually in accordance with the NER by adding to (or deducting from) the AR:

- the service target performance incentive scheme revenue increment (or revenue decrement)<sup>6</sup>
- any approved pass through amounts.<sup>7</sup>

The annual MAR is established according to the following formula:

$$\begin{aligned} \text{MAR}_t &= (\text{allowed revenue}) + (\text{performance incentive}) + (\text{pass through}) \\ &= \text{AR}_t + \left( \left( \text{AR}_{t-2} \times \frac{1}{2} \right) + \left( \text{AR}_{t-1} \times \frac{1}{2} \right) \right) \times S_{ct} + P_t \end{aligned}$$

where:

MAR = the maximum allowed revenue

AR = the allowed revenue

S = the revenue increment or decrement determined in accordance with the STPIS

P = the pass through amount (positive or negative) that the AER has determined in accordance with clauses 6A.7.2 and 6A.7.3 of the NER

$t$  = time period/financial year (for  $t = 2$  (2019–20), 3 (2020–21), 4 (2021–20), 5 (2022–23))

$ct$  = time period/calendar year (for  $ct = 2$  (2018), 3 (2019),

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<sup>6</sup> NER, c. 6A.7.4.

<sup>7</sup> NER, cl. 6A.7.2 and 6A.7.3.

4 (2020), 5 (2021)).

TransGrid may also adjust the MAR for under or over-recovery amounts.<sup>8</sup> That is, if the revenue amounts earned from providing prescribed transmission services in previous regulatory years are higher or lower than the sum of the approved MAR for those years, the difference can be included in the subsequent years' MAR. In the case of an under-recovery, the amount is added to the subsequent years' MAR. In the case of an over-recovery, the amount is subtracted from the subsequent years' MAR.

Table 1-3 sets out the timing of the annual calculation of the AR and performance incentive.

**Table 1-3 Timing of the calculation of allowed revenues and the performance incentive for TransGrid**

<i>t</i>	Allowed revenue (financial year)	<i>ct</i>	Performance incentive (calendar year)
2	1 July 2019– 30 June 2020	2	1 January 2018– 31 December 2018
3	1 July 2019– 30 June 2021	3	1 January 2019– 31 December 2019
4	1 July 2019– 30 June 2022	4	1 January 2020– 31 December 2020
5	1 July 2019– 30 June 2023	5	1 January 2021– 31 December 2021

Note: The performance incentive for 1 January 2017–31 December 2017 is to be applied to the AR determined for 2018–19 (AR<sub>1</sub>).

## 1.4 Regulatory asset base

We determine an opening RAB value of \$6371.2 million as at the commencement of the 2018–23 regulatory control period for TransGrid.

## 1.5 Method for indexation of the regulatory asset base

The method for indexing TransGrid's RAB for each year of the 2018–23 regulatory control period will be the same as that used to escalate its AR for that relevant year—that is, to apply the annual percentage change in the published ABS CPI all groups, weighted average of eight capital cities.<sup>9</sup> For TransGrid, this will be the December quarter CPI. This method will be used as part of the roll forward of TransGrid's opening RAB for the purposes of the AER's transmission revenue determination for the regulatory control period commencing on 1 July 2023.

<sup>8</sup> NER, cl. 6A.23.3(e)(5) and 6A.24.4(c).

<sup>9</sup> ABS, *Catalogue number 6401.0, Consumer price index*, Australia.

## 1.6 Performance incentive scheme parameters

All components of version 5 of the STPIS will apply to TransGrid for the 2018–23 regulatory control period. The parameters applicable to TransGrid are set out in the tables below.

**Table 1-4 Final decision — Service Component Caps, floors and targets for 2017–2022**

Parameter	Best fit	Cap	Target	Floor
Average circuit outage rate				
Lines event rate – fault	Pearson5	9.6%	13.3%	18.2%
Transformer event rate – fault	Loglogistic	8.3%	13.8%	21.5%
Reactive plant event rate – fault	Gamma	5.7%	10.3%	15.9%
Lines event rate – forced	Loglogistic	11.2%	17.6%	26.1%
Transformer event rate – forced	Loglogistic	15.1%	26.5%	41.1%
Reactive plant event rate – forced	Weibull	15.6%	22.1%	27.8%
Loss of supply events				
Number of events > 0.05 system minutes per annum				
	Poisson	1	3	6
Number of events > 0.4 system minutes per annum				
	Geometric	0	1	3
Average outage duration	Loglogistic	28	104	265
<b>Proper operation of equipment</b>				
Failure of protection system	Poisson	11	17	25
Material failure of supervisory control and data acquisition (SCADA) system	Poisson	1	3	6
Incorrect operational isolation of primary or secondary equipment	Poisson	3	7	12

Source: AER analysis

**Table 1-5 Final decision —MIC parameter values for 2018–2023**

Parameter values - MIC	
Performance target	1348
Unplanned outage event limit	229
Dollar per dispatch interval	\$5317

Source: AER analysis

**Table 1-6 Final decision — Network capability priority projects for 2018–2023 (\$2016-17)**

Priority projects ranking assigned by TransGrid	Project	Description	Improvement target	Capex \$	Opex \$	Total \$
2	North Western Transfer Tripping Scheme	The North Western transfer tripping scheme would open the Narrabri-Moree 132 kV line (96M) in protection clearing time following outage of both Armidale-Tamworth 330 kV lines (85 and 86).	Commissioning of transfer tripping scheme. Moree solar farm allowed to supply during outage of 85 or 86 line.	120,000	2,400	122,400
3	Replace limiting high voltage plant at Wagga 132 kV substation (Line 99X rating augmentation)	Replace wave trap on line 99X at Wagga 132 substation	184 MVA (due to wave trap at Wagga 132 on line 99W)	638,000	-	638,000
9	SMART wires on Upper Tumut-Yass 330 kV line	Installation of SMART wires to reduce reactance of Upper Tumut-Yass 330 kV line.	Increase the Snowy – NSW cut-set capacity by 26 MW to 2735 MW	5,600,000	110,000	5,710,000
10	Dynamic Line Rating Monitoring	Install Dynamic Line Ratings system	4 to 20% increase from normal circuit rating during favourable weather conditions.	5,160,000	100,000	5,260,000
11	Implementation of transfer tripping Scheme at Cooma	Implement a control system to trip Boco Rock windfarm, following a coincident outage both Williamsdale-Cooma 132 kV circuits (978 & 97D).	Boco Rock wind generator allowed to operate at full output following a planned or unplanned outage of 978 or 97D 132 kV circuit.	130,000	-	130,000

13	Implementation of transfer tripping scheme at Gadara, Tumut and Burrinjuck	Implement a control system to trip Gadara-Tumut (99P), Tumut-Burrinjuck (992) and Tumut-Blowering(97B) 132 kV circuits following coincident outage of Yass-Burrinjuck (970) & Wagga-Gadara (993), Burrinjuck-Tumut (992) & 993, 970 & Gadara-Tumut (99P) or 992 & 99P 132 kV circuits.	Installation of tripping scheme would allow generators at Burrinjuck, Blowering and Gadara to operate at full output following a planned or unplanned outage of a single 132 kV circuit.	360,000	6,800	366,800
15	Queensland-New South Wales (QNI) interconnector	Installation of a 330 kV, 120 MVar shunt capacitor bank at Armidale substation	Installation of capacitor and update of constrain equations in AEMO's NEMDE	4,690,000	94,000	4,784,000
17	Implement dynamic rating system for Darlington Point 330/220 tie transformers	Develop & implement dynamic rating system for Darlington Point 330/220 kV transformers	202 MVA during favourable conditions	600,000		600,000
18	Replace limiting high voltage plant on Mt Piper-Wallerawang 330 kV lines (TL 70 and 71)	Replace limiting HV plant and upgrade secondary plant limitations on Mt Piper-Wallerawang 330 kV lines at Mt Piper and Wallerawang substations.	1300 MVA	3,330,000	67,000	3,397,000
20	Armidale capacitor transfer tripping scheme	Implementation of transfer tripping scheme for the Armidale 132 kV capacitor bank	Remove market impact to realise a Market benefit = \$0.03 million/year (based on the historical binding constraints information).	200,000	-	200,000
21	Increase Ratings of Wagga-Lower Tumut 330 kV	Replace wave traps at LTSS and increase CT ratio at	Replaced line wave trap improves the limit to 1371	300,000	-	300,000

	line (TL 051)	Wagga SS.	MVA (2400 amps)			
22	Capacitor bank to improve NSW-VIC transfer limit	Installation of a 330 kV 100 MVA shunt capacitor bank at Stockdill substation.	Voltage stability limits that cause constraints on NSW export to Victoria. Market impact = \$0.79 million /year	5,510,000	110,00	5,620,000
<b>Total</b>				<b>26,638,000</b>	<b>490,200</b>	<b>27,128,200</b>

Source: AER analysis

## 1.7 Efficiency benefit sharing scheme parameters

The values for the efficiency benefit sharing scheme (EBSS) parameters that are to apply to TransGrid in the 2018–23 period, subject to adjustments required by the EBSS, are set out in Table 1-7.

**Table 1-7 AER's decision on TransGrid's forecast opex for the EBSS (\$million, 2017–18)**

	2018–19	2019–20	2020–21	2021–22	2022–23	Total
Forecast opex	175.6	178.7	182.7	189.0	181.3	907.3
less debt raising costs	-3.2	-3.3	-3.3	-3.3	-3.4	-16.5
less network support costs	-0.7	-2.6	-5.8	-10.0	-	-19.1
<b>Forecast opex for EBSS purposes</b>	<b>171.6</b>	<b>172.9</b>	<b>173.6</b>	<b>175.7</b>	<b>177.9</b>	<b>871.7</b>

Source: AER analysis.

In calculating EBSS carryover amounts, the AER will exclude the following costs from the EBSS:

- debt raising costs
- network support costs.

In addition to these excluded cost categories we will also:

- adjust forecast opex to add (subtract) any approved revenue increments (decrements) made after the 2018–23 regulatory determination. This may include approved pass through amounts.
- adjust actual opex to add capitalised opex that has been excluded from the RAB
- exclude categories of opex not forecast using a single year revealed cost approach for the regulatory control period beginning in 2023 where doing so better achieves the requirements of clause 6A.6.5 of the NER.

When calculating actual opex under the EBSS we will adjust reported actual opex for the 2018–23 period to reverse any movements in provisions.

## 1.8 Application of the capital expenditure sharing scheme

We will apply version 1 of the CESS as set out in the capital expenditure incentives guideline to TransGrid’s 2018–23 regulatory control period.<sup>10</sup> The guideline provides for the exclusion from the CESS of capex the service provider incurs in delivering a priority project approved under the network capability component of the STPIS.<sup>11</sup>

We applied the CESS to TransGrid in the 2014–18 regulatory control period. Our final decision on the revenue impact of the application of the CESS compared to TransGrid’s revised proposal is summarised in Table 1.8.

**Table 1.8 AER’s final decision on TransGrid’s CESS revenue increment for the 2018–23 regulatory control period (\$million, 2017–2018)**

	2018-19	2019-20	2020-21	2021-22	2022-23	Total
AER final decision	6.7	6.7	6.7	6.7	6.7	33.6

Note: Numbers may not add up due to rounding.

## 1.9 Commencement and length of the regulatory control period

The regulatory control period will be five years, commencing on 1 July 2018 and ending on 30 June 2023.

## 1.10 Depreciation for establishing the regulatory asset base as at the commencement of the next regulatory control period

The depreciation approach to be applied to establish TransGrid’s RAB at the commencement of the 2023–28 regulatory control period will be based on the depreciation schedules (straight-line) using forecast capital expenditure at the asset class level approved for the 2018–23 regulatory control period.

## 1.11 Annually updating the return on debt

Our final decision on the return on debt approach is to:

<sup>10</sup> AER, *Capex incentive guideline*, November 2013, pp. 5–9; NER, cl. 6A.6.5A(e).

<sup>11</sup> AER, *Capex incentive guideline*, November 2013, p. 6.

- Continue the full transition from the on-the-day approach for the first (2014/15) regulatory year of TransGrid's prior regulatory control period into a trailing average approach over 10 years

This gradual transition will occur through updating 10 per cent of the entire return on debt each year to reflect prevailing market conditions in that year (a full transition).<sup>12</sup> Because our return on debt approach involves annual updates to the return on debt, this means that the return on debt will be, or potentially will be, different for different regulatory years in the regulatory control period.<sup>13</sup> The NER require that the resulting change to TransGrid's annual building block revenue requirement is to be effected through a formula specified in the revenue determination.<sup>14</sup> For the purposes of clause 6A.6.2(l), our final decision is that the resulting change to TransGrid's annual building block revenue requirement is to be effected through:

- the automatic application of the return on debt methodology specified in this section 1.11
- using the return on debt averaging periods specified in confidential appendix N to our draft decision and
- implemented using TransGrid's final determination post-tax revenue model (PTRM) in accordance with section 3 of the AER's PTRM handbook for transmission network service providers.<sup>15</sup>

The return on debt methodology in this section specifies our final decision:

- methodology on the return on debt approach, and
- methodology to implement the return on debt approach

### 1.11.1 Approach to estimating the return on debt

This section sets out our final decision methodology on the return on debt approach. Below we specify the allowed return on debt formulae for each year of the 10 year transition path. In each formula:

${}_aR_{a+10}$  corresponds to the estimated return on debt that was entered into in year  $a$  and matures in year  $a+10$ —which is to be calculated using the return on debt implementation methodology in section 1.12 and TransGrid's return on debt averaging periods specified in confidential appendix N of our draft decision.

${}_bkd_{b+1}$  refers to the allowed return on debt for regulatory year  $b+1$ .

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<sup>12</sup> By entire return on debt, we mean 100% of the base rate and debt risk premium (DRP) components of the allowed return on debt.

<sup>13</sup> NER, cl. 6A.6.2(i); NGR r. 87(9).

<sup>14</sup> NER, cl. 6A.6.2(l); NGR r. 87(12).

<sup>15</sup> AER, *Final decision—Amendment—Electricity TNSPs PTRM handbook*, 29 January 2015.

In the first regulatory year of transitioning to the trailing average approach (2014/15), the allowed rate of return on debt was based on the estimated prevailing rate of return on debt for that year (similar to the 'on the day' approach):

$${}_0kd_1 = {}_0R_{10}$$

In the second regulatory year (2015/16), the allowed rate of return on debt was the weighted average of the prevailing rates in the first and second regulatory years of the transitional period:

$${}_1kd_2 = 0.9 \cdot {}_0R_{10} + 0.1 \cdot {}_1R_{11}$$

In the third regulatory year (2016/17), the allowed rate of return on debt was the weighted average of the prevailing rates in the first, second, and third regulatory years of the transitional period:

$${}_2kd_3 = 0.8 \cdot {}_0R_{10} + 0.1 \cdot {}_1R_{11} + 0.1 \cdot {}_2R_{12}$$

In the fourth regulatory year (2017/18), the allowed rate of return on debt was the weighted average of the prevailing rates in the first, second, third and fourth regulatory years of the transitional period:

$${}_3kd_4 = 0.7 \cdot {}_0R_{10} + 0.1 \cdot {}_1R_{11} + 0.1 \cdot {}_2R_{12} + 0.1 \cdot {}_3R_{13}$$

In the fifth regulatory year (the upcoming regulatory control period, that is 2018/19), the allowed rate of return on debt will be the weighted average of the prevailing rates in the first, second, third, fourth and fifth regulatory years of the transitional period:

$${}_4kd_5 = 0.6 \cdot {}_0R_{10} + 0.1 \cdot {}_1R_{11} + 0.1 \cdot {}_2R_{12} + 0.1 \cdot {}_3R_{13} + 0.1 \cdot {}_4R_{14}$$

The calculation for all subsequent regulatory years until the transitional period is completed is set out below:

$${}_5kd_6 = 0.5 \cdot {}_0R_{10} + 0.1 \cdot {}_1R_{11} + 0.1 \cdot {}_2R_{12} + 0.1 \cdot {}_3R_{13} + 0.1 \cdot {}_4R_{14} + 0.1 \cdot {}_5R_{15}$$

$${}_6kd_7 = 0.4 \cdot {}_0R_{10} + 0.1 \cdot {}_1R_{11} + 0.1 \cdot {}_2R_{12} + 0.1 \cdot {}_3R_{13} + 0.1 \cdot {}_4R_{14} + 0.1 \cdot {}_5R_{15} + 0.1 \cdot {}_6R_{16}$$

$${}_7kd_8 = 0.3 \cdot {}_0R_{10} + 0.1 \cdot {}_1R_{11} + 0.1 \cdot {}_2R_{12} + 0.1 \cdot {}_3R_{13} + 0.1 \cdot {}_4R_{14} + 0.1 \cdot {}_5R_{15} + 0.1 \cdot {}_6R_{16} + 0.1 \cdot {}_7R_{17}$$

$${}_8kd_9 = 0.2 \cdot {}_0R_{10} + 0.1 \cdot {}_1R_{11} + 0.1 \cdot {}_2R_{12} + 0.1 \cdot {}_3R_{13} + 0.1 \cdot {}_4R_{14} + 0.1 \cdot {}_5R_{15} + 0.1 \cdot {}_6R_{16} + 0.1 \cdot {}_7R_{17} + 0.1 \cdot {}_8R_{18}$$

$${}_9kd_{10} = 0.1 \cdot {}_0R_{10} + 0.1 \cdot {}_1R_{11} + 0.1 \cdot {}_2R_{12} + 0.1 \cdot {}_3R_{13} + 0.1 \cdot {}_4R_{14} + 0.1 \cdot {}_5R_{15} + 0.1 \cdot {}_6R_{16} + 0.1 \cdot {}_7R_{17} + 0.1 \cdot {}_8R_{18} + 0.1 \cdot {}_9R_{19}$$

## 1.12 Implementing the return on debt approach

This section sets out our final decision methodology to implement the return on debt approach. This section specifies:

- our choice of data series
- extrapolation and interpolation issues with adjusting our choice of data series
- step-by-step calculation to calculating the final RBA and BVAL estimate
- contingencies associated with implementing our choice of data series, if the data series we have chosen to estimate the return on debt are unavailable or change in future regulatory years

### 1.12.1 Choice of data series

Our final decision on the choice of data series is to adopt a simple average of the debt data series published by the RBA and Bloomberg that match, as close as available, our benchmarks of a BBB+ credit rating and a 10 year debt term. Specifically, we adopt a simple average of:

- The RBA broad-BBB rated 10 year curve, extrapolated to an effective term of 10 years (the RBA curve)
- The Bloomberg Valuation Service (BVAL) broad-BBB rated curve (the BVAL curve). Depending on the maximum term published at the time, this will be either the BVAL:
  - 10 year estimate<sup>16</sup> where it is available
  - 7 year estimate extrapolated to a 10 year term using the 7–10 year margin from the RBA curve. This will be used where the 7 year estimate is available and the 10 year estimate is not available
  - 5 year estimate extrapolated to a 10 year term using the 5–10 year margin from the RBA curve. This will be used where the 5 year estimate is available and neither the 10 year nor the 7 year estimates are available.

### 1.12.2 Choice of data series—Extrapolation and interpolation issues

Our final decision on extrapolation and interpolation issues is:

- extrapolation—where we need to extend a curve beyond its observed or published range. For example, before April 2015, Bloomberg publishes its BVAL curve to a maximum term of 7 years, whereas we require an estimate for a 10 year term.
- Interpolation—where we need a value for which there is no published estimate but it lies between two published estimates. For example, the RBA only publishes its

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<sup>16</sup> As of 14 April 2015, Bloomberg has revised its methodology for the BVAL curve (BVCSAB10). It has correspondingly recommenced publishing a 10 year yield estimate.

curve estimates for one day each month, but we require estimates for each business day.

Specifically, we will make the following adjustments as set out in table 1-9 and table 1-10.

**Table 1-9 Adjustments to the RBA curve**

Adjustment type	Amendment made?	Comments
Interpolation to construct daily estimates	Yes	<p>The RBA curve only provides an estimate for one business day at the end of each month. In our experience, averaging periods commonly start and/or end on dates during the month.</p> <p>We will address this issue by linearly interpolating between month end values where possible. While we are satisfied that interpolation over business days is also reasonable, we will interpolate over all days because:</p> <ul style="list-style-type: none"> <li>• this is consistent with our widely accepted approach to interpolate estimates of the risk free rate using CGS</li> <li>• interpolating over all days is simpler to implement</li> <li>• it is impractical to interpolate over business days for estimating the risk free rate, as this would require calculations relative to specific trading days 10 years in advance</li> <li>• the difference to the estimates between interpolating over business days or interpolating over all days is immaterial.<sup>17</sup></li> </ul> <p>Where this is not practical due to timing, we will hold the last available RBA monthly estimate constant until the end of the averaging period. It would not be practical to linearly interpolate between two RBA monthly estimates where the allowed return on debt must be estimated and incorporated into the annual debt update process before the publication of the next RBA monthly estimate after the end of the averaging period. Our final decision on the annual debt update process is set out in this section.</p>
Extrapolation to target term	Yes	<p>The 'effective term' of the RBA bond sample is commonly less than 10 years. For this reason, Lally recommended that the spread component of the yield should be extrapolated from its effective term at publication to the benchmark term (10 years).<sup>18</sup></p> <p>We agree with Lally's recommendation to extrapolate the spread component of the RBA's published yield in order to match it with the benchmark term of debt. However, we do not agree it is necessary to extrapolate the base component. As identified by the RBA and Lally,<sup>19</sup> the base component of the published 10 year yield already matches the benchmark term of debt. Therefore, extrapolating this component would result be erroneous and lead to overcompensation in most circumstances, where the yield curve is upward sloping.</p>
Conversion to effective annual rate	Yes	<p>The RBA's published methodology does not explicitly specify whether the published yields should be interpreted as effective annual rates. Effective annual rates are a consistent basis on which to compare bond rates and imply that the coupon payments compound during the year. We therefore</p>

<sup>17</sup> For example, the difference between approaches between 2 June 2014 to 30-June 2014 was 22 basis points, which means it would have changed the return on debt by 0.0022 per cent.

<sup>18</sup> Lally, *Implementation issues for the cost of debt*, November 2014, pp. 38–44.

<sup>19</sup> See the 'notes' tab in RBA, *Aggregate measures of Australia corporate bond spreads and yields*, available at: <http://www.rba.gov.au/statistics/tables/xls/f03hist.xls>; Lally, *Implementation issues for the cost of debt*, November 2014, pp. 38–44.

Adjustment type	Amendment made?	Comments
		<p>consulted the RBA, who informed us that 'the spreads and yields in F3 can be best thought of as annual rates with semi-annual compounding'.<sup>20</sup> Therefore, this would require conversion into an effective annual rate, using the same approach as is applied to the BVAL yield estimate.</p>

Source: AER analysis.

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<sup>20</sup> RBA, *Email in response to: AER follow up question on the basis of YTM quotations in RBA statistical table F3*, 16 October 2014.

**Table 1-10 Adjustments to the BVAL curve**

Adjustment type	Amendment made?	Comments
Interpolation to construct daily estimates	No	Bloomberg publishes daily estimates.
Extrapolation to target term	Depends on maximum term published by Bloomberg	<p>For most of the time that the BVAL curve has been published, it has had a maximum term of 7 years. However, between September 2014 and November 2014, it was published to a maximum 5 year term.<sup>21</sup> In April 2015, Bloomberg revised its methodology for the BVAL curve (BVCSAB10) and it now publishes a 10 year estimate.<sup>22</sup></p> <p>For the periods where 7 years is the maximum term, we extrapolate the spread component of the 7 year yield estimate to the 10 year target term. We have done so using the margin between the spread components of the extrapolated RBA 7 and 10 year yield estimates, converted to effective annual rates. We add to this extrapolation the difference between the base CGS estimates from 7 to 10 years. That is:</p> $\text{BVAL yield 10 years} = \text{BVAL yield 7 years} + \text{difference in CGS from 7 to 10 years} + \text{difference in RBA extrapolated spread to CGS from 7 to 10 years}$ <p>As recommended by Lally,<sup>23</sup> we are satisfied this approach is comparably reliable to the more complex approaches submitted by other stakeholders,<sup>24</sup> but is simpler to implement and based on publicly available data.</p> <p>For the period where 5 years is the maximum term, we extrapolate the spread component of the 5 year yield estimate to the 10 year target term using an analogous methodology to that used to extrapolate from 7 to 10 years.</p> <p>For the period where 10 years is the maximum term, we do not extrapolate the estimate.</p>
Conversion to effective annual rate	Yes	Bloomberg publishes its yield as annual rates with semi-annual compounding. This needs to be converted into an effective annual rate.

### 1.12.3 Choice of data series—Step-by-step guide to calculations

Below we describe the step-by-step processes of calculating:

<sup>21</sup> Specifically, from 15 September 2014 to 3 November 2014.

<sup>22</sup> Specifically, 14 April 2015.

<sup>23</sup> Lally, *Implementation issues for the cost of debt*, November 2014, pp. 38–44.

<sup>24</sup> Incenta, *Methodology for extrapolating the debt risk premium*, June 2014, pp. 2–3.

- the adjusted RBA estimate
- the adjusted BVAL estimate
- the final estimate—where we combine our implementations of the RBA estimate and the BVAL estimate.

These formula steps relate to the approach specified in this final decision. In the event that data availability changes during the regulatory control period, the formulas below will change to reflect the contingencies set out in section 1.12.4.

For the purposes of calculating the return on debt, a 'business day' is a day that is not a Saturday or Sunday and not a national or NSW public holiday. This is because the independent data service providers (RBA and Bloomberg) do not publish data on national or NSW public holidays.

#### *Calculation of the adjusted RBA estimate*

1. Download RBA table F3—'Aggregate measures of Australian corporate bond yields' from the RBA website.
2. From this file, download the 7 and 10 year 'Non-financial corporate BBB-rated bonds—Yield' entries for dates:
  - a. from the most recent published RBA date prior to the commencement of the nominated averaging period for debt
  - b. to the first published RBA date following the conclusion of the nominated averaging period for debt
  - c. all published dates between a. and b.
3. Download, from RBA table F16—'Indicative Mid Rates of Australian Government Securities - 2013 to Current', daily yields on CGSs for dates within the service provider's averaging period.
4. Linearly interpolate between the two nearest bonds straddling 7 years remaining term to maturity,<sup>25</sup> and the two nearest CGS bonds straddling 10 years remaining term to maturity. This should be done using the following formula: <sup>26</sup>

$$\text{yield interpolated} = \text{yield lower straddle bond} + (\text{yield upper straddle bond} - \text{yield lower straddle bond}) * (\text{date 10 years from interpolation date} - \text{maturity date lower straddle bond}) / (\text{maturity date upper straddle bond} - \text{maturity date lower straddle bond}).$$


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<sup>25</sup> That is, the bond with the nearest maturity date that is earlier than 10 years from the interpolation date, and the bond with the nearest maturity date than is later than 10 years from the interpolation date.

<sup>26</sup> This formula relies on the operation in Microsoft Excel. Dates can be subtracted from one another to work out the number of days in between two dates.

5. Linearly extrapolate the published RBA 10 year yield (from step 2) from its published effective term to an effective term of 10 years using the formula below:<sup>27</sup>

$$\text{yield}_{10} = \text{yield}_{10 \text{ year published}} + \left[ \frac{(\text{spread to swap}_{10 \text{ year published}} - \text{spread to swap}_{7 \text{ year published}})}{(\text{effective term}_{10 \text{ year published}} - \text{effective term}_{7 \text{ year published}})} \right] * (10 - \text{effective term}_{10 \text{ year published}}).$$

6. Linearly extrapolate the published RBA 7 year yield (from step 2) from its published effective term to an effective term of 7 years using the formula below:<sup>28</sup>

$$\text{yield}_7 = \text{yield}_{7 \text{ year published}} + \left[ \frac{(\text{spread to swap}_{10 \text{ year published}} - \text{spread to swap}_{7 \text{ year published}})}{(\text{effective term}_{10 \text{ year published}} - \text{effective term}_{7 \text{ year published}})} \right] * (7 - \text{effective term}_{7 \text{ year published}}).$$

7. Subtract from the extrapolated 10 year RBA yield on each publication date the interpolated CGS yield on that date. For the 10 year term, use the RBA series as adjusted in step 5. These are the adjusted RBA 10 year spreads.<sup>29</sup>
8. Obtain daily RBA spread estimates by linear interpolation of the adjusted RBA spreads (from steps 5 and 6) for both 7 and 10 year terms between the published dates identified in step 2. Use the adjusted RBA spread estimates as calculated in step 6. This should be done using the following formula:

$$\text{spread}_{\text{interpolated}} = \text{spread}_{\text{first straddling publication date}} + \left( \frac{\text{date}_{\text{interpolation}} - \text{date}_{\text{first straddling publication date}}}{\text{date}_{\text{second straddling publication date}} - \text{date}_{\text{first straddling publication date}}} \right) * (\text{spread}_{\text{second straddling publication date}} - \text{spread}_{\text{first straddling publication date}})$$

Note: If the annual return on debt estimate must be finalised before a final published RBA month-end estimate is available, hold the last observed RBA spread constant to the end of the averaging period.

9. Add to these daily spreads (from step 8), daily interpolated estimates of the CGS (from step 4) for all business days in the service providers averaging period. Specifically:
- add the 7 year interpolated CGS estimates to the 7 year interpolated RBA spreads. These are the interpolated RBA daily 7-year yield estimates.
  - add the 10 year interpolated CGS estimate to the 10 year interpolated RBA spread. These are the interpolated RBA daily 10-year yield estimates.

<sup>27</sup> As per Lally, *Implementation issues for the cost of debt*, November 2014, pp. 38–44.

<sup>28</sup> As per Lally, *Implementation issues for the cost of debt*, November 2014, pp. 38–44.

<sup>29</sup> We have re-calculated the published 'spread to CGS' by subtracting our estimate of the interpolated CGS, as calculated in step 4, from the RBA's published yield to maturity. This allows us to combine daily data from the CGS with an estimate of the spread calculated correctly with reference to both the RBA's yield estimate and our estimate of CGS.

10. Convert the interpolated daily yield estimates (from step 9) to effective annual rates, using the formula:<sup>30</sup>

$$\text{effective annual rate} = ((1 + \text{yield} / 200)^2 - 1) * 100$$

11. Average the yield estimate for the 10 year RBA yield estimate over all business days in TransGrid's averaging period. This is our adjusted RBA estimate.

#### *Calculation of the adjusted BVAL estimate*

1. For dates after 14 April 2015, download the 10 year Corporate BBB rated Australian BVAL curve (BVCSAB10).<sup>31</sup>
2. Convert the 10 year yields into effective annual rates, using the formula:

$$\text{effective annual rate} = ((1 + \text{yield} / 200)^2 - 1) * 100$$

3. Average the extrapolated daily estimates of the BVAL 10 year yield over all business days in the TransGrid's averaging period. This is our adjusted BVAL estimate.

#### *Final estimate*

Take the simple average of the adjusted RBA estimate (from step 11 in the RBA data section) and the adjusted BVAL estimate (from step 4 in the BVAL data section). This is the annual estimate of the return on debt.

### **1.12.4 Choice of data series—Contingencies**

Our decision is to largely maintain the set of contingencies as set out in our recent decisions.<sup>32</sup> We have made our final decision based on the information and third party data that is currently available.<sup>33</sup> Nonetheless, in our experience it is common that the availability of third party data changes.

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<sup>30</sup> In this formula, the term 'published yield / 200' is based on the yield being published as a number (e.g. 2.0) rather than a percentage (e.g. 2 %, or 0.02). The RBA yield data is published in this form at the time of this decision. For example, where the yield is published as '2.0', this is equivalent to 2 per cent or 0.02. However, it is necessary to convert from the published yield to either alternative to calculate the effective annual rate. If the spread was published as 2 per cent, this term would be 'published spread/2'.

<sup>31</sup> In previous decisions, we have stated that for dates before 14 April 2015, calculating the adjusted BVAL estimate would require downloading the 7 year Corporate BBB rated Australian BVAL curve (BVCSAB07 index) and adding the difference between the 7 and 10 year daily RBA adjusted yields (as calculated in step 8 of the RBA process) to this yield. However, under the approach in this final decision, all averaging period dates should be after 14 April 2015.

<sup>32</sup> For example, see AER, *Final decision—CitiPower determination, Attachment 3: Rate of return*, May 2016, pp. 359–61; Final decision- *AusNet, Attachment 3: Rate of Return*, April 2017, pp.361-363.

<sup>33</sup> As of 14 April 2015, Bloomberg has revised its methodology for the BVAL curve (BVCSAB10). It has correspondingly recommenced publishing a 10 year yield estimate.

Specifically, our decision is to annually update the trailing average portfolio return on debt. We have set out a series of contingencies in table 1-11, below. These describe how we propose to estimate the annual return on debt in the event of revisions in the RBA's or Bloomberg's methodologies or other changes to data availability.

**Table 1-11 Contingency approaches to choice of data series**

Event	Changes to approach
Either the RBA or Bloomberg ceases publication, temporarily or permanently, of Australian yield curves that reflect a broad BBB rating.	We will estimate the annual return on debt using the remaining curve.
A different third party commences publication of a 10 year yield estimate (or we are made aware of a different third party publishing a 10 year yield estimate) <sup>34</sup> .	We will not apply estimates from a third party data provider that we have not evaluated and included in our final decision approach. We will consider any new data sources in future determinations.
Either Bloomberg or RBA substitutes its current methodology for a revised or updated methodology.	We will adopt the revised or updated methodology. Then, at the next regulatory determination, we will review this updated methodology. As noted above, we would also review any new data sources.  However, if Bloomberg or the RBA backcasts or replaces data using a revised or updated methodology we will not use the backcasted data to re-estimate our estimates of the prevailing return on debt for previous years. This would be impractical and would create regulatory uncertainty over whether the allowed return on debt would at some point in the future be re-opened. Instead, we will continue to use the Bloomberg or RBA data that we downloaded at the time of estimating the prevailing return on debt for that point in time. <sup>35</sup>
Bloomberg reduces the maximum published BVAL term from 10 years	If Bloomberg still publishes the BVAL curve to 5 or more years, we will extrapolate the BVAL curve from the longest published term to 10 years using the corresponding yield margin from the RBA curve. <sup>36</sup>

<sup>34</sup> Or we determine it is open to us to use the Reuters curve, following a proper assessment and period of consultation on this information.

<sup>35</sup> For example, for the current decisions we downloaded the RBA monthly data observation for August 2015 shortly after it was published (in September), and incorporated this data point into our prevailing return on debt estimates. After the RBA published its monthly observation for September (in October), we downloaded this data point too. This final data point is only relevant for estimation of Multinet placeholder averaging period. In doing so, we noticed that it appears the RBA has revised its methodology (though does not appear to have explained this change), and has backcast its monthly observations for the entire data series which starts in January 2005. However, we have not incorporated this backcasted RBA data into our return on debt estimates. Instead, we have continued to use the data we downloaded at the time of estimation. We note that if we had incorporated the backdated RBA data this would have decreased the allowed return on debt for the Queensland, SA and Victorian electricity distributors by between approximately 1–2 basis points. Accordingly, in this instance, our approach of not using the backdated data is in this group of service providers' interests. Our approach will be symmetrical and consistent over time, so we will not use backcast data that results from a change in the RBA or Bloomberg's methodology regardless of whether it is in or against the interests of particular groups of service providers or particular groups of consumers.

<sup>36</sup> For example, where Bloomberg only publishes a 6 year curve, we will extrapolate it to 10 years using the 6 to 10 year yield margin from the RBA curve. Or, where Bloomberg only publishes a 7 year estimate, we will extrapolate it to 10 years using the 7 to 10 year yield margin from the RBA curve.

Event	Changes to approach
	If Bloomberg no longer publishes the BVAL curve to 5 years, we will rely entirely on the RBA curve.
The RBA ceases publication of a 10 year yield estimate.	<p>If the RBA ceases publication of a 10 year yield estimate, we will extrapolate the RBA estimate to 10 years using:</p> <ul style="list-style-type: none"> <li>• if available, the margin between spreads in the Bloomberg curve,<sup>37</sup> from the RBA's longest published target term to 10 years</li> <li>• otherwise, the actual CGS margin from the RBA's longest published estimate to 10 years, plus the average DRP spread for the same term margin over the last month prior to the end of its publication.</li> </ul>
The RBA commences publication of daily estimates.	We will cease interpolating the RBA monthly yields. Instead, we will estimate both the RBA yield and the RBA year extrapolation margin (used with the BVAL curve) using these daily estimates.
Either Bloomberg or the RBA publishes a BBB+ or utilities specific yield curve.	We will adopt the BBB+ or utilities curve in place of the provider's existing curve, on the basis that it is a closer fit to a benchmark efficient entity for the service provider.

Source: AER analysis.

### **Averaging periods**

Our final decision is to accept TransGrid's proposed debt averaging periods for 2018 to 2022.<sup>38</sup>

We specified these averaging periods for the 2018 to 2022 regulatory years in confidential Appendix N to our draft decision.<sup>39</sup> This is because our practice is to keep the dates of averaging periods confidential until they have expired.

In the Guideline, we proposed that service providers could nominate averaging periods of 10 or more consecutive business days up to a maximum of 12 months.<sup>40</sup> We also proposed that an averaging period should satisfy certain conditions. We developed these conditions so that the application of the averaging period contributes to the achievement of the ARORO.<sup>41</sup>

### **Annual debt update process**

The general process we propose to adopt for the annual debt update for TransGrid is set out in table 1-12.

<sup>37</sup> Specifically, the spread to CGS.

<sup>38</sup> TransGrid, *Nomination of averaging periods for the allowed return on debt and equity for the 2017/18-2022/23 regulatory control period*, January 2017.

<sup>39</sup> AER, *Draft Decision TransGrid transmission determination 2018 to 2023 Attachment 3 – Rate of return, Averaging period – confidential appendix N*, September 2017.

<sup>40</sup> AER, *Rate of return guideline*, December 2013, p. 21.

<sup>41</sup> NER, cll. 6.5.2(c) and 6A.6.2(c); NGR, r. 87(3).

**Table 1-12 Annual debt update process**

Step	Timing	Description of step	Reasons for timing
1	25 business days before transmission prices are published.	Averaging period ends on or before this date	We determine the maximum practical end date of the averaging period from the timing of steps 2 and 3.
2	10 business days before transmission prices are published.	So TransGrid can factor this its transmission prices, we inform it of updates on the return on debt, annual building block revenue requirement and X factor that incorporates the updated return on debt	15 business days between steps 1 and 2 provides sufficient time for us to calculate (and provide quality assurance checks on) the updated return on debt, revenue and X factor.
3	Transmission prices published on the date determined by the rules	TransGrid publishes transmission prices for the relevant year.	10 business days between steps 2 and 3 is based on service providers' advice regarding the minimum period it would require to factor the updated information into its prices.

Source: AER analysis.

The process outlined in Table 1-12 does not apply to the first year of the regulatory period. This is because in our determination, X factors will already incorporate the return on debt for the first year.

The above process factors in the date that the NER require transmission prices to be published (for TransGrid, by 15 March each year).

## 2 Negotiating framework

TransGrid must comply with its negotiating framework and its NTSC (see section 3 of this determination) when it is negotiating the terms and conditions of access for negotiated transmission services to be provided to a person.<sup>42</sup>

TransGrid's negotiating framework sets out the procedure to be followed during negotiations between TransGrid and any person who wishes to receive a negotiated transmission service from TransGrid, as to the terms and conditions of access for provision of the service.<sup>43</sup>

Our approved negotiating framework for TransGrid is set out in attachment A to this determination.

On 23 May 2017, the Australian Energy Market Commission (AEMC) published a final determination and final rule on transmission connections and planning arrangements.<sup>44</sup> The final rule sets out significant changes to the arrangements by which parties connect to the transmission network, as well as changes to enhance how transmission network businesses plan their networks. The rule change removes the requirement, on and from 1 July 2018, for TNSPs to develop individual negotiating frameworks for approval by the AER, and for the AER to specify NTSC that apply to TNSPs.

In light of the AEMC rule change, our negotiating framework determination of 30 April 2018 will cease to apply from 1 July 2018.

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<sup>42</sup> NER, cl. 6A.9.2(a); 6A.9.3. TransGrid must also comply with chapters 4, 5 and 6A of the NER.

<sup>43</sup> NER, cl. 6A.9.5(a).

<sup>44</sup> AEMC, *National Electricity Amendment (Transmission Connection and Planning Arrangements) Rule 2017 No. 4*.

### 3 Negotiated transmission service criteria (NTSC)

TransGrid must comply with its negotiating framework (see section 2 of this determination) and its NTSC when it is negotiating the terms and conditions of access for negotiated transmission services to be provided to a person.<sup>45</sup>

TransGrid's NTSC sets out the criteria that are to be applied:<sup>46</sup>

- by TransGrid in negotiating:
  - the terms and conditions of access for negotiated transmission services, including the prices that are to be charged for the provision of those services by TransGrid for the regulatory control period
  - any access charges which are negotiated by TransGrid during the regulatory control period
- by a commercial arbitrator in resolving any dispute, between TransGrid and a person who wishes to receive a negotiated transmission service, in relation to:
  - the terms and conditions of access for the negotiated transmission service, including the price that is to be charged for the provision of that service by TransGrid
  - any access charges that are to be paid to or by TransGrid.

The following NTSC will apply to TransGrid for the regulatory control period covered by this determination.

#### National Electricity Objective

1. The terms and conditions of access for a negotiated transmission service, including the price that is to be charged for the provision of that service and any access charges, should promote the achievement of the National Electricity Objective.

#### Criteria for terms and conditions of access

##### *Terms and conditions of access*

2. The terms and conditions of access for a negotiated transmission service must be fair, reasonable and consistent with the safe and reliable operation of the power system in accordance with the NER.

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<sup>45</sup> NER, cl.6A.9.2(a); 6A.9.3. TransGrid must also comply with chapters 4, 5 and 6A of the NER.

<sup>46</sup> NER, cl. 6A.9.4.

3. The terms and conditions of access for negotiated transmission services, particularly any exclusions and limitations of liability and indemnities, must not be unreasonably onerous. Relevant considerations include the allocation of risk between the TNSP and the other party, the price for the negotiated transmission service and the cost to the TNSP of providing the negotiated service.
4. The terms and conditions of access for a negotiated transmission service must take into account the need for the service to be provided in a manner that does not adversely affect the safe and reliable operation of the power system in accordance with the NER.

### ***Price of services***

5. The price of a negotiated transmission service must reflect the cost that the TNSP has incurred or incurs in providing that service, and must be determined in accordance with the principles and policies set out in the Cost Allocation Methodology.
6. Subject to criteria 7 and 8, the price for a negotiated transmission service must be at least equal to the avoided cost of providing that service but no more than the cost of providing it on a stand-alone basis.
7. If the negotiated transmission service is a shared transmission service that:
  - (a) exceeds any network performance requirements which it is required to meet under any relevant electricity legislation; or
  - (b) exceeds the network performance requirements set out in schedule 5.1a and 5.1 of the NER

then the difference between the price for that service and the price for the shared transmission service which meets network performance requirements must reflect the TNSP's incremental cost of providing that service (as appropriate).

8. For shared transmission services, the difference in price between a negotiated transmission service that does not meet or exceed network performance requirements and a service that meets those requirements should reflect the TNSP's avoided costs. Schedules 5.1a and 5.1 of the NER or any relevant electricity legislation must be considered in determining whether any network service performance requirements have not been met or exceeded.
9. The price for a negotiated transmission service must be the same for all Transmission Network Users. The exception is if there is a material difference in the costs of providing the negotiated transmission service to different Transmission Network Users or classes of Transmission Network Users.
10. The price for a negotiated transmission service must be subject to adjustment over time to the extent that the assets used to provide that service are subsequently used to provide services to another person. In such cases, the adjustment must reflect the extent to which the costs of that asset are recovered through charges to that other person.

11. The price for a negotiated transmission service must be such as to enable the TNSP to recover the efficient costs of complying with all regulatory obligations associated with the provision of the negotiated transmission service.

## **Criteria for access charges**

### ***Access charges***

12. Any access charges must be based on the costs reasonably incurred by the TNSP in providing Transmission Network User access. This includes the compensation for forgone revenue referred to in clause 5.4A(h) to (j) of the NER and the costs that are likely to be incurred by a person referred to in clause 5.4A(h) to (j) of the NER (as appropriate).

## 4 Pricing methodology

The pricing methodology that will apply to TransGrid for the period of this determination is set out in Attachment B.

The role of TransGrid's pricing methodology is to answer the question 'who should pay how much'<sup>47</sup> in order for TransGrid to recover its costs. TransGrid's pricing methodology provides a 'formula, process or approach'<sup>48</sup> that when applied:

- allocates the aggregate annual revenue requirement to the categories of prescribed transmission services that a transmission business provides and to the connection points of network users<sup>49</sup>
- determines the structure of prices that a transmission business may charge for each category of prescribed transmission services.<sup>50</sup>

TransGrid's pricing methodology relates to prescribed transmission services only.

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<sup>47</sup> AEMC, *Rule determination: National Electricity Amendment (Pricing of Prescribed Transmission Services) Rule 2006 No. 22*, 21 December 2006, p. 1.

<sup>48</sup> NER, cl. 6A.24.1(b).

<sup>49</sup> NER, cl. 6A.24.1(b)(1).

<sup>50</sup> NER, cl. 6A.24.1(b)(2).

## 5 Pass through events

A pass through event is one which entails TransGrid incurring materially lower or higher costs in providing prescribed transmission services than it would have incurred but for that event (a negative or positive change event, respectively).<sup>51</sup> Where a pass through event occurs TransGrid may seek our approval to, or we may require TransGrid to pass those cost changes through to its users.<sup>52</sup>

Under the NER any of the following is a pass through event for this transmission determination:<sup>53</sup>

- a regulatory change event
- a service standard event
- a tax change event
- an insurance event
- any other event specified in this transmission determination as a pass through event for this determination.

The first four of these pass through events are prescribed by, and defined in, the NER.<sup>54</sup> In addition, the following nominated pass through events will apply:

**Table 5-1 Approved nominated pass through events**

Event	Definition
Insurance Cap Event	<p>An insurance cap event occurs if:</p> <ol style="list-style-type: none"> <li>1. TransGrid makes a claim or claims and receives the benefit of a payment or payments under a relevant insurance policy.</li> <li>2. TransGrid incurs costs beyond the policy limit of the relevant insurance policy at the time of the event that gives rise to the relevant claim</li> <li>3. the costs beyond the relevant policy limit materially increase the costs to TransGrid in providing prescribed transmission services.</li> </ol> <p>For this insurance cap event a relevant insurance policy is an insurance policy held during the 2018/19 – 2022/23 regulatory control period or a previous regulatory control period in which TransGrid was regulated.</p> <p>Note: in making a determination on an insurance cap event, the AER will have regard to, amongst other things:</p> <ol style="list-style-type: none"> <li>i. the insurance policy for the event</li> <li>ii. the level of insurance that an efficient and prudent TNSP would obtain in</li> </ol>

<sup>51</sup> NER, Chapter 10 Glossary.

<sup>52</sup> NER, cl. 6A.7.3(a), (b).

<sup>53</sup> NER, cl. 6A.7.3(1a).

<sup>54</sup> NER, Chapter 10 Glossary.

Event	Definition
	<p>respect of the event</p> <p>iii. any assessment by the AER of TransGrid's insurance documented in respect of its transmission determination for the relevant period.</p>
Insurer Credit Risk Event	<p>An insurer's credit risk event occurs if:</p> <p>A nominated insurer of TransGrid becomes insolvent, and as a result, in respect of an existing, or potential, claim for a risk that was insured by the insolvent insurer, TransGrid:</p> <ol style="list-style-type: none"> <li>1. is subject to a materially higher or lower claim limit or a materially higher or lower deductible than would have otherwise applied under the insolvent insurer's policy; or</li> <li>2. incurs additional costs associated with self-funding an insurance claim, which would otherwise have been covered by the insolvent insurer.</li> </ol> <p>Note: In assessing an insurer's credit risk event pass through application, the AER will have regard to, amongst other things:</p> <ol style="list-style-type: none"> <li>i. TransGrid's attempts to mitigate and prevent the event from occurring by reviewing and considering the insurer's track record, size, credit rating and reputation, and</li> <li>ii. in the event that a claim would have been made after the insurance provider became insolvent, whether TransGrid had reasonable opportunity to insure the risk with a different provider.</li> </ol>
Natural Disaster Event	<p>Natural Disaster Event means any natural disaster including but not limited to fire, flood or earthquake that occurs during the 2018/19 – 2022/23 regulatory control period that increases the costs to TransGrid in providing prescribed transmission services, provided the fire, flood or other event was not a consequence of the acts or omissions of the service provider.</p> <p>Note: In assessing a Natural Disaster Event pass through application, the AER will have regard to, amongst other things:</p> <ol style="list-style-type: none"> <li>i. whether TransGrid has insurance against the event; and</li> <li>ii. the level of insurance that an efficient and prudent NSP would obtain in respect of the event.</li> </ol>
Terrorism Event	<p>A terrorism event occurs if:</p> <p>An act (including, but not limited to, the use of force or violence or the threat of force or violence) of any person or group of persons (whether acting alone or on behalf of or in connection with any organisation or government), which from its nature or context is done for, or in connection with, political, religious, ideological, ethnic or similar purposes or reasons (including the intention to influence or intimidate any government and/or put the public, or any section of the public, in fear) and which increases the costs to TransGrid in providing prescribed transmission services.</p> <p>Note: In assessing a terrorism event pass through application, the AER will have regard to, amongst other things:</p> <ol style="list-style-type: none"> <li>i. whether TransGrid has insurance against the event</li> <li>ii. the level of insurance that an efficient and prudent NSP would obtain in respect of the event</li> <li>iii. whether a declaration has been made by a relevant government authority that an act of terrorism has occurred.</li> </ol>