Rate of Return Instrument

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AUSTRALIAN ENERGY REGULATOR

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Rate of return Instrument

1. This instrument sets out the way to calculate the rate of return on capital and sets out the value of imputation credits. The same methodology applies in relation to all regulated services and service providers in calculating the rate of return. The same value of imputation credits applies in relation to all regulated services and service providers. The AER is satisfied the instrument will, or is most likely to, contribute to the achievement of the national electricity objective and the national gas objective to the greatest degree.[1]
2. Bold italicised expressions in this instrument are defined in the glossary in clause 36.

Allowed rate of return

3. The way to calculate the rate of return for each ***regulatory year*** t in a ***regulatory control period*** is as follows:

$$k_t = k^e(1 - G) + k_t^d \cdot G$$

Where:

a) k_t is the rate of return in ***regulatory year*** t (the **allowed rate of return**)

b) k^e is the allowed return on equity for the ***regulatory control period*** and is calculated in accordance with clause 4

c) k_t^d is the allowed return on debt for the ***regulatory year*** t, and is calculated in accordance with clause 9

d) G is the ***gearing ratio***, and is set at a value of 0.6.

Return on equity

4. The allowed return on equity for the ***regulatory control period*** is calculated as follows:

$$k^e = k^f + \beta \cdot MRP$$

Where:

a) k^f is the allowed risk free rate of return expressed as an effective annual percentage per annum and is calculated in accordance with clause 5.
Note 1: k^f and k^e are set for the ***regulatory control period*** for which the determination or arrangement is made.

b) β is the allowed equity beta, and is set to a value of 0.6

c) MRP is the allowed market risk premium, and is set to an effective annual value of 6.2 per cent per annum.

Risk free rate of return

5. The allowed risk free rate of return is the simple average of the daily 10-year ***YTMs*** for a ***CGS***, converted into an effective annual rate, for each specific ***business day*** i over the

[1] Note: This instrument applies as the second Rate of Return Instrument made under the NEL and the NGL.

risk free rate averaging period specified in accordance with clause 7, clause 8 and clause 25, and is calculated as follows:

$$k^f = \frac{1}{|L|}\sum_{i \in L} y_i^f$$

Where

d) k^f refers to the allowed risk free rate of return expressed as an effective annual rate percentage.

e) i refers to a specific ***business day*** i.

f) y_i^f refers to the daily 10-year ***YTM*** for a ***CGS*** on ***business day*** i, converted into an effective annual rate in accordance with clause 6 for each specific ***business day*** i within the ***risk free rate averaging period***, specified in accordance with clause 7, clause 8 and clause 25.

g) L refers to the set of all ***business days*** within the ***risk free rate averaging period*** nominated in accordance with clause 7, clause 8 and clause 25.

h) $|L|$ refers to the number of ***business days*** within L.

6. The allowed risk free rate of return requires that daily 10-year ***YTM*** for a ***CGS*** be converted into an effective annual rate for each specific ***business day*** i within the ***risk free rate averaging period***, if the daily 10-year ***YTM*** for a ***CGS*** is published as a decimal (eg, 5 per cent is expressed as 0.05), it must be converted into an effective annual rate as follows:

$$y_i^f = \left(\left(1 + \frac{y_i^{CGS}}{x^{CGS}}\right)^{x^{CGS}} - 1\right) * 100$$

Where:

a) y_i^f refers to the daily 10-year ***YTM*** for a ***CGS*** on ***business day*** i, converted into an effective annual rate in accordance with this clause.

b) y_i^{CGS}refers to the daily 10-year ***YTM*** for a ***CGS*** on ***business day*** i, calculated in accordance with clause 29.

c) x^{CGS} refers to the frequency of the compounding interest[2] over the course of a year on the y_i^{CGS} in clause 6 b) above.

Note 2: For the avoidance of doubt, if the frequency of the compounding interest on the ***CGS*** yield is semi-annual, then x^{CGS} will be 2. If the frequency of the compounding interest on the ***CGS*** yield is monthly then x^{CGS} will be 12.

d) If $y_i^{CGS}$is expressed as a percentage (eg 5 per cent expressed as 5), then the daily 10-year ***YTM*** for a ***CGS*** must be converted into effective annual rates as follows:

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[2] The AER will assume that, unless specified otherwise, the frequency of the compounding interest over the course of a year is quoted in accordance with the Australian Financial Markets Authority conventions laid out in their Long Term Government Debt Securities Conventions, available at https://afma.com.au/standards/market-conventions/Long%20Term%20Government%20Debt%20Securities%20Conventions.pdf

$$y_i^f = \left(\left(1 + \frac{y_i^{CGS}}{x^{CGS} * 100}\right)^{x^{CGS}} - 1\right) * 100$$

Risk free rate averaging period

7. The ***risk free rate averaging period*** is:

a) the period nominated by a ***service provider*** which satisfies the conditions set out in clause 8, whether the period was nominated before or after the commencement of this instrument, or

b) if no period is nominated in accordance with clause 7a), or a period is nominated that does not meet the conditions set out in clause 8 for the ***regulatory control period*** to which this instrument is being applied, a period of 20 consecutive ***business days*** in length that finishes 4 ***months*** before the start of the ***regulatory control period***.

8. A ***risk free rate averaging period*** nominated in accordance with clause 7a) must:

a) be over a period of 20 or more ***business days*** up to a maximum of 60 ***business days.***

b) start no earlier than 8 ***months*** prior to the commencement of the ***regulatory control period***

c) finish no later than 4 ***months*** prior to the commencement of the ***regulatory control period***, unless the service provider is specified in clause 25 in which case it must finish no later than 3 months prior to the commencement of the regulatory control period, and

d) be nominated both:

i. prior to the start of the ***risk free rate averaging period***, and

ii. no later than the date of lodgement of the regulatory proposal for the regulatory control period.

Return on debt trailing average portfolio calculation

9. Except for regulated network businesses covered by clause 9', ~~T~~the allowed return on debt for ***regulatory year*** t is calculated as follows:

$$If\ t_s = t\ ;\ k_t^d = \frac{10 - (t - t_s)}{10} R_{t_s}\ (\text{1st year of the } transition\ period)$$

$$If\ t > t_s \geq t - 9;\ k_t^d = \frac{10 - (t - t_s)}{10} R_{t_s} + \frac{1}{10} \sum_{j=t_s+1}^{t} R_j \qquad (10\ year\ transition\ period)$$

$$If\ t_s < t - 9;\ k_t^d = \frac{1}{10} \sum_{j=t-9}^{t} R_j \qquad (trailing\ average)$$

Where:

(a) k_t^d refers to the allowed return on debt for ***regulatory year*** t expressed as a percentage, and once finalised, is not updated. k_t^d is deemed to have been finalised on the earlier of:

i. when the AER notifies the ***service provider*** of the annual estimate, or

ii. eight weeks after the end of the annual ***return on debt averaging period***, calculated in accordance with clause 23, clause 24 and clause 25.

(b) t refers to the ***regulatory year*** for which the allowed return on debt is being calculated

(c) t_s refers to the first ***regulatory year*** of the ***transition period***

(d) R_{t_s} refers to the on-the-day rate of return on debt in ***regulatory year*** t_s, and is calculated in accordance with clause 10

(e) j indexes a series of ***regulatory years*** for summation

(f) R_j refers to the on-the-day rate of return on debt in any ***regulatory year*** in the series j, and is calculated in accordance with clause 10

(g) $k_t^d = \frac{10-(t-t_s)}{10} R_{t_s}$ refers to the calculation of the allowed return on debt in ***regulatory year*** t, when ***regulatory year*** t is the first year of the ***transition period.***

Note 3: For example, if for a particular service, t_s is 2016 (ie, the first ***regulatory year*** of the ***transition period*** for that service):

- and if t **is 2016** (ie, the first ***regulatory year*** of the ***transition period***), then

$k_{2016}^d = \frac{10-(2016-2016)}{10} R_{2016}$,as $t_s = t$ ie, $2016 = 2016$, thus

$k_{2016}^d = R_{2016}$

(h) $k_t^d = \frac{10-(t-t_s)}{10} R_{t_s} + \frac{1}{10}\sum_{j=t_s+1}^{t} R_j$ refers to the calculation of the allowed return on debt in ***regulatory year*** t during the ***transition period***.

Note 4: For example, if for a particular service, t_s is 2016 (ie, the first ***regulatory year*** of the ***transition period*** for that service):

- and if t **is 2017**, then

$k_{2017}^d = \frac{10-(2017-2016)}{10} R_{2016} + \frac{1}{10}\sum_{j=2017}^{2017} R_j$ as $t > t_s \geq t - 9$ ie, $2017 > 2016 \geq 2008$, thus

$k_{2017}^d = 0.9\, R_{2016} + 0.1 R_{2017}$

- and if t **is 2025** (ie, the 10th regulatory year of the transition period), then $k_{2025}^d = \frac{10-(2025-2016)}{10} R_{2016} + \frac{1}{10}\sum_{j=2017}^{2025} R_j$ as $t > t_s \geq t - 9$, ie, $2025 > 2016 \geq 2016$, thus

$$k_{2025}^d = 0.1\, R_{2016} + 0.1R_{2017} + 0.1R_{2018} + 0.1R_{2019} + 0.1R_{2020} + 0.1R_{2021} + 0.1R_{2022} + 0.1R_{2023} + 0.1R_{2024} + 0.1R_{2025}$$

(i) $k_t^d = \frac{1}{10}\sum_{j=t-9}^{t} R_j$ refers to the calculation of the allowed return on debt in ***regulatory year*** t using a ***trailing average portfolio approach***, upon the completion of the transition period in clause 9(h).

Note 5: For example, if for a particular service, t_s is 2016 (ie, the first regulatory year of the transition period):

- And if t **is 2026** (ie, the 11th regulatory year), then

$k_{2026}^d = \frac{1}{10}\sum_{j=2017}^{2026} R_j$ as $t_s < t-9$ ie, $2016 < 2017$, thus

$$k_{2026}^d = 0.1\,R_{2017} + 0.1R_{2018} + 0.1R_{2019} + 0.1R_{2020} + 0.1R_{2021} + 0.1R_{2022} + 0.1R_{2023} + 0.1R_{2024} + 0.1R_{2025} + 0.1R_{2026}.$$

9′. **For the regulated networks that have moved regulatory years from a calendar year basis to a financial year basis prior to 1 January 2024, the allowed return on debt for regulatory year *t* is calculated as follows:**

$$If\ t = t_s\ ;\ k_t^d = \frac{10-(t-t_s)}{10}\,R_{t_s}\ (\text{1st year of the } transition\ period)$$

$$If\ t > t_s \geq t-4;\ k_t^d = \frac{10-(t-t_s)}{10}\,R_{t_s} + \frac{1}{10}\sum_{j=t_s+1}^{t} R_j \qquad (regulatory\ years\ 2\ to\ 5)$$

$$If\ t = 6;\ k_t^d = \frac{10-(t-t_s)}{10}\,R_{t_s} + \frac{1}{10}\sum_{j=t_s+1}^{t} R_j \qquad (regulatory\ year\ 6, a\ six\ month\ period)$$

$$If\ 10 \geq t \geq 7;\ k_t^d = \frac{11.5-t}{10}\,R_{t_s} + \frac{1}{10}\left(\sum_{j=t_s+1}^{5} R_j + \frac{1}{2}R_6 + \sum_{j=7}^{t} R_j\right)\ (regulatory\ years\ 7\ to\ 10)$$

$$If\ 14 \geq t \geq 11; k_t^d = \frac{1}{20}\,R_{t-10} + \frac{1}{10}\left(\sum_{j=t-9}^{5} R_j + \frac{1}{2}R_6 + \sum_{j=7}^{t} R_j\right)\ (regulatory\ years\ 11\ to\ 14)$$

$$If\ t = 15; k_t^d = \frac{1}{20}\,R_5 + \frac{1}{20}R_6 + \frac{1}{10}\left(\sum_{j=7}^{t} R_j\right)\ (regulatory\ year\ 15)$$

$$If\ t > 15;\ k_t^d = \frac{1}{10}\sum_{j=t-9}^{t} R_j \qquad (trailing\ average)$$

Where:

(a) k_t^d refers to the allowed return on debt for ***regulatory year*** t expressed as a percentage, and once finalised, is not updated. k_t^d is deemed to have been finalised on the earlier of:

i. when the AER notifies the ***service provider*** of the annual estimate, or

ii. eight weeks after the end of the (usually annual) ***return on debt averaging period***, calculated in accordance with clause 23, clause 24 and clause 25.

(b) t refers to the ***regulatory year*** for which the allowed return on debt is being calculated, indexed so that first regulatory year of the transition period is t = 1, such that:

t = 1 = first regulatory year of the transition period
t = 2 = second regulatory year of the transition period
…
t = 5 = fifth regulatory year of the transition period
t = 6 = sixth regulatory year of the transition period that runs from 1 Jan to 30 Jun of the relevant year (mini year)
t = 7 = seventh regulatory year of the transition period
t = 8 = eight regulatory year of the transition period
… and so on

(c) t_s refers to the first ***regulatory year*** of the ***transition period***

(d) R_{t_s} refers to the on-the-day rate of return on debt in ***regulatory year*** t_s, and is calculated in accordance with clause 10

(e) j indexes a series of ***regulatory years*** for summation

(f) R_j refers to the on-the-day rate of return on debt in any ***regulatory year*** in the series j, and is calculated in accordance with clause 10

(g) $k_t^d = \frac{10-(t-t_s)}{10} R_{t_s}$ refers to the calculation of the allowed return on debt in ***regulatory year*** t, when ***regulatory year*** t is the first year of the ***transition period.***

Note 3: For example, if for a particular service, t_s is 1 (ie, the first ***regulatory year*** of the ***transition period*** for that service):

- and if t **is 1** (ie, the first ***regulatory year*** of the ***transition period***), then

$k_1^d = \frac{10-(1-1)}{10} R_1$,as $t_s = t$ ie, $1 = 1$, thus

$k_1^d = R_1$

(h) $k_t^d = \frac{10-(t-t_s)}{10} R_{t_s} + \frac{1}{10}\sum_{j=t_s+1}^{t} R_j$ refers to the calculation of the allowed return on debt in ***regulatory year*** t during the regulatory years two to six of the ***transition period***.

Note 4: For example, if for a particular service, t_s is 1 (ie, the first ***regulatory year*** of the ***transition period*** for that service):

- and if t **is 2**, then

$k_2^d = \frac{10-(2-1)}{10} R_1 + \frac{1}{10}\sum_{j=2}^{2} R_j$ as $t > t_s \geq t - 4$ ie, $2 > 1 \geq -2$, thus

$k_2^d = 0.9\, R_1 + 0.1 R_2$

- and if t **is 5** (ie, the 5th ***regulatory year*** of the ***transition period***), then

$k_5^d = \frac{10-(5-1)}{10} R_1 + \frac{1}{10}\sum_{j=2}^{5} R_j$ as $t > t_s \geq t - 4$, ie, $5 > 1 \geq 1$, thus

$k_5^d = 0.6\,R_1 + 0.1R_2 + 0.1R_3 + 0.1R_4 + 0.1R_5$

- and if t **is 6** (ie, the 6th ***regulatory year*** of the ***transition period***, noting that this regulatory year is a six month period), then

$k_6^d = \frac{10-(6-1)}{10} R_1 + \frac{1}{10}\sum_{j=2}^{6} R_j$ as $t = 6$, thus

$k_{65}^d = 0.5\,R_1 + 0.1R_2 + 0.1R_3 + 0.1R_4 + 0.1R_5 + 0.1R_6$

(i) $k_t^d = \frac{11.5-t}{10} R_{t_s} + \frac{1}{10}\left(\sum_{j=t_s+1}^{5} R_j + \frac{1}{2}R_6 + \sum_{j=7}^{t} R_j\right)$ refers to the calculation of the allowed return on debt in ***regulatory year*** t during the regulatory years seven to ten of the ***transition period***.

Note 5: For example, if for a particular service, t_s is 1 (ie, the first ***regulatory year*** of the ***transition period*** for that service):

i. and if t **is 8**, then

$k_8^d = \frac{11.5-8}{10} R_{t_s} + \frac{1}{10}\left(\sum_{j=t_s+1}^{5} R_j + \frac{1}{2}R_6 + \sum_{j=7}^{8} R_j\right)$ as $10 \geq t \geq 7$ ie, $10 \geq 8 \geq 7$, thus

$k_8^d = 0.35\,R_1 + 0.1R_2 + 0.1R_3 + 0.1R_4 + 0.1R_5 + 0.05R_6 + 0.1R_7 + 0.1R_8$

(j) $k_t^d = \frac{1}{20} R_{t-10} + \frac{1}{10}\left(\sum_{j=t-9}^{5} R_j + \frac{1}{2}R_6 + \sum_{j=7}^{t} R_j\right)$ refers to the calculation of the allowed return on debt in ***regulatory year*** t during the regulatory years eleven to fourteen of the ***transition period***.

Note 5A: For example, if for a particular service, t_s is 1 (ie, the first ***regulatory year*** of the ***transition period*** for that service):

i. and if t **is 12**, then

$k_{12}^d = \frac{1}{20} R_2 + \frac{1}{10}\left(\sum_{j=3}^{5} R_j + \frac{1}{2}R_6 + \sum_{j=7}^{12} R_j\right)$ as $15 \geq t \geq 11$ ie, $15 \geq 12 \geq 11$, thus

$k_{12}^d = 0.05\,R_2 + 0.1R_3 + 0.1R_4 + 0.1R_5 + 0.05R_6 + 0.1R_7 + 0.1R_8 + 0.1R_9 + 0.1R_{10} + 0.1R_{11} + 0.1R_{12}$

(k) $k_t^d = \frac{1}{20} R_5 + \frac{1}{20}R_6 + \frac{1}{10}\left(\sum_{j=7}^{t} R_j\right)$ refers to the calculation of the allowed return on debt in ***regulatory year*** t for the regulatory year 15.

Note 5B: For example, if for a particular service, t_s is 1 (ie, the first ***regulatory year*** of the ***transition period*** for that service):

i. and if t **is 15**, then

$k_{15}^d = \frac{1}{20} R_5 + \frac{1}{20}R_6 + \frac{1}{10}\left(\sum_{j=7}^{15} R_j\right)$ as $t = 15$, thus

$k_{15}^d = 0.05\,R_5 + 0.05R_6 + 0.1R_7 + 0.1R_8 + 0.1R_9 + 0.1R_{10} + 0.1R_{11} + 0.1R_{12} + 0.1R_{13} + 0.1R_{14} + 0.1R_{15}$

(l) $k_t^d = \frac{1}{10}\sum_{j=t-9}^{t} R_j$ refers to the calculation of the allowed return on debt in ***regulatory year*** t using a ***trailing average portfolio approach***, upon the completion of the move to financial years (ie when t > 15).

Note 5C: For example, if for a particular service, t_s is 1 (ie, the first regulatory year of the transition period):

- And if t **is 17** (ie, the 17th regulatory year), then

$k_{17}^{d} = \frac{1}{10}\sum_{j=8}^{17} R_j$ as $t > 15$ ie, $17 > 15$, thus

$$k_{17}^{d} = 0.1\,R_8 + 0.1R_9 + 0.1R_{10} + 0.1R_{11} + 0.1R_{12} + 0.1R_{13} + 0.1R_{14} + 0.1R_{15} + 0.1R_{16} + 0.1R_{17}$$

On-the-day return on debt calculation

10. The on-the-day rate of return on debt for ***regulatory year*** j is calculated as follows:

$$If\ D \geq 25/02/23;\ R_j = \frac{1}{|L_j|}\sum_{i \in L_j} y_{i,j}^{d}$$

$$If\ D < 25/02/23; R_j = k_j^{d}$$

Where:

(a) D refers to the date on the commencement of the ***regulatory control period*** within which ***regulatory year*** j commences.

(b) R_j refers to the on-the-day rate of return on debt for ***regulatory year*** j expressed as a percentage effective annual rate.

Note 6: Clause 10 also applies to the calculation of R_{t_s} (ie, replace 'j' with 't_s').

(c) $y_{i,j}^{d}$ refers to the daily 10-year ***YTM*** effective annual rate estimate for ***business day*** i within the ***return on debt averaging period*** for ***regulatory year*** j and is calculated in accordance with clause 11.

(d) L_j refers to the set of all ***business days*** within the ***return on debt averaging period*** for ***regulatory year*** j, nominated in accordance with clause 23 and clause 24.

(e) $|L_j|$ refers to the number of ***business days*** within L_j.

(f) k_j^{d} refers to the on-the-day rate of return on debt for ***regulatory year*** j previously determined by the AER and deemed finalised in accordance with the methodology set out in its relevant determination.

(g) $\sum_{i \in L_j} y_i^{d}$refers to the sum of $y_{i,j}^{d}$ for each ***business day*** i over the ***return on debt averaging period*** for ***regulatory year*** j, where the ***return on debt averaging period*** is determined in accordance with clause 23 and clause 24.

Note 7: For the avoidance of doubt, for the calculation of R_j, where the on-the-day rate of return on debt for ***regulatory year*** j is to be calculated on or after 25/02/2023, each ***business day*** i within the L_j may be on or before 25/02/2023 as long as it complies with clause 23 and clause 24.

11. Subject to the contingencies in clause 26, the daily yield estimates over the ***return on debt averaging period*** for ***regulatory year*** j, used in clause 10(c) above, must be calculated as an average of each ***curve provider's*** daily yield estimates as follows:

$$y_{i,j}^{d} = \frac{1}{3} \cdot \frac{1}{|A|_i} \cdot \sum_{c} y_{i,j}^{cA,EAR} + \frac{2}{3} \cdot \frac{1}{|B|_i} \cdot \sum_{c} y_{i,j}^{cB,EAR} \text{ , } c \in \{BVA, RBA, TR\}$$

Where:

(a) $y_{i,j}^{d}$ refers to the daily 10 year ***YTM*** effective annual rate estimate for ***business day*** i within the ***return on debt averaging period*** for ***regulatory year*** j

(b) $y_{i,j}^{cA,EAR}$ refers to the $y_{i,j}^{cY,EAR}$ for ***curve provider*** c's broad A-rated curve on ***business day*** i within the ***return on debt averaging period*** for ***regulatory year*** j.

(c) $y_{i,j}^{cB,EAR}$ refers to the $y_{i,j}^{cY,EAR}$ for ***curve provider*** c's broad BBB-rated curve on ***business day*** i within the ***return on debt averaging period*** for ***regulatory year*** j.

(d) $y_{i,j}^{cY,EAR}$ refers to the daily broad credit rating band (band Y) 10-year ***YTM*** converted into an effective annual rate on ***business day*** i within the ***return on debt averaging period*** for ***regulatory year*** j, for ***curve provider*** $c \in \{BVA, RBA, TR\}$ calculated in accordance with clause 12.

(e) $|A|_i$ refers to the number of ***curve providers*** for which a daily credit band A 10-year ***YTM*** estimate is calculated in accordance with clause 31 and converted into an effective annual rate in accordance with clause 12 on ***business day*** i

(f) $|B|_i$ refers to the number of ***curve providers*** for which a daily credit band BBB 10-year ***YTM*** estimate is calculated in accordance with clause 31 and converted into an effective annual rate in accordance with clause 12 on ***business day*** i

(g) BVA refers to the ***curve provider*** Bloomberg

(h) RBA refers to the ***curve provider*** Reserve Bank of Australia

(i) TR refers to the ***curve provider*** Refinitiv

Note 8: for the avoidance of doubt, the following example clarifies how this clause 11 will apply if clause 26 a) applies. If on a specific ***business day*** i, Bloomberg does not publish a broad BBB-rated credit band but does publish a broad A-rated credit band and all other curve providers publish both curves, then $|B|_i$will be 2 and the $|A|_i$ will be 3. Then, $\sum_c y_{i,j}^{cB,EAR}$ will be the sum of the RBA and TR daily BBB-rated 10-year ***YTMs***, converted into an effective annual rate, while the $\sum_c y_{i,j}^{cA,EAR}$ will be the sum of the RBA, BVA, and TR daily A-rated 10-year ***YTMs***, converted into an effective annual rate.

Conversion to effective annual rates

12. Subject to the contingencies in clause 26, all daily Bloomberg, RBA and Refinitiv band Y 10-year ***YTM*** estimates, if expressed as a decimal (eg, 5 per cent is expressed as 0.05), must be converted into effective annual rates as follows:

$$y_{i,j}^{cY,EAR} = \left(\left(1 + \frac{y_i^{cY}}{x^{cY}}\right)^{x^{cY}} - 1\right) \cdot 100$$

Where:

(a) $y_{i,j}^{cY,EAR}$ refers to the daily band Y 10-year ***YTM*** estimate on ***business day*** i within the ***return on debt averaging period*** for ***regulatory year*** j, for ***curve provider*** $c \in \{BVA, RBA, TR\}$ converted into an effective annual rate.

(b) y_i^{cY} refers to the daily band Y 10-year ***YTM***s for ***curve provider*** *c* on ***business day*** i calculated in accordance with clause 31.

Note 9: for the avoidance of doubt, Bloomberg and Refinitiv currently publishes daily semi-annually compounded 10-year ***YTM*** estimates, and so extrapolation and interpolation is not required. However, extrapolation may be required for these estimates, in the event that the term to maturity of their ***YTM*** estimates is not exactly 10 years. The RBA currently publishes 10-year broad A-rated and broad BBB-rated ***YTM*** estimates to be assumed to be semi-annually compounded for conversion to effective annual rates that have ***Effective tenors*** of less than 10 years and so extrapolation is currently required to extend their term to maturity to exactly 10 years in accordance with clause 14. The RBA also publishes its 10-year ***Target Tenor*** yield to maturity estimates for one day at the end of each month (a publication frequency of monthly), and so interpolation is required to obtain daily estimates in accordance with clause 16, clause 17, clause 18 and clause 19.

(c) x^{cY} refers to the frequency of the compounding interest over the course of a year on the y_i^{cY} calculated in accordance with clause 12(b) above.

Note 10: For the avoidance of doubt, if the frequency of the compounding interest on the y_i^{cY} is semi-annual, then x^{cY} will be 2. If the frequency of the compounding interest on the y_i^{cY} is monthly then x^{cY} will be 12.

(d) If a daily band Y 10-year ***YTM*** for ***curve provider*** *c* on ***business day*** i is expressed as a percentage (eg 5 per cent is expressed as 5), it must be converted into effective annual rates as follows:

$$y_{i,j}^{cY,EAR} = ((1 + \frac{y_i^{cY}}{x^{cY} \cdot 100})^{x^{cY}} - 1) \cdot 100$$

Linear extrapolation

Calculation of daily CGS and ADSWAP yields using linear extrapolation

13. Where linear extrapolation is necessary to calculate a daily ***CGS*** or ***ADSWAP YTM*** estimate for a target term to maturity on ***business day*** i, under the conditions specified

in clause 29 for ***CGS*** calculations and clause 30 for ***ADSWAP*** calculations. The linearly extrapolated ***CGS*** or ***ADSWAP YTM*** must be calculated as follows:

$$y_i^{\emptyset} = y_b^{\emptyset} + \left(m_i^{\emptyset} - m_b^{\emptyset}\right)\frac{\left(y_b^{\emptyset} - y_a^{\emptyset}\right)}{\left(m_b^{\emptyset} - m_a^{\emptyset}\right)}, for\ m_a^{\emptyset} < m_b^{\emptyset} < m_i^{\emptyset}$$

Where:

a) $y_i^{\emptyset}$ refers to the daily ***CGS*** or ***ADSWAP YTM*** estimates for a target term to maturity on ***business day*** i, which is calculated using linear extrapolation when applying the formula in this clause 13.

b) $\emptyset$ refers to either the ***CGS*** or ***ADSWAP***, depending on which is being calculated in clause 13 a) above.

c) $m_i^{\emptyset}$ refers to the target term to maturity of $\emptyset$ for a specific ***business day*** i

Note 11: If extrapolation is required to calculate a 10-year ***YTM*** for a ***CGS*** on ***business day*** i, $m_i^{\emptyset}$ will be 10 years.

d) $y_b^{\emptyset}$ refers to the un-extrapolated ***CGS*** or ***ADSWAP YTM*** for the longest published term to maturity, greater than or equal to $\left|m_i^{\emptyset} - 3\right|$ but less than $m_i^{\emptyset}$on ***business day*** i, sourced in accordance with clause 32 for ***CGS*** calculations and sourced in accordance with clause 35 for ***ADSWAP*** calculations.

e) $y_a^{\emptyset}$ refers to the un-extrapolated ***CGS*** or ***ADSWAP YTM*** for the second longest published term to maturity, greater than or equal to $\left|m_i^{\emptyset} - 3\right|$ but less than $m_i^{\emptyset}$ on ***business day*** i, sourced in accordance with clause 32 for ***CGS*** calculations and sourced in accordance with clause 35 for ***ADSWAP*** calculations.

f) $\left|m_i^{\emptyset} - 3\right|$ refers to the term to maturity that is 3 years earlier than the target term to maturity.

Note 12: for the avoidance of doubt, if $m_i^{\emptyset}$ is 10 years, then $\left|m_i^{\emptyset} - 3\right|$ will be equal to 7 years.

g) $m_b^{\emptyset}$ is the term to maturity for $y_b^{\emptyset}$

h) $m_a^{\emptyset}$ is the term to maturity for $y_a^{\emptyset}$

Note 13: $m_a^{\emptyset}$and $m_b^{\emptyset}$ are specific for each ***business day*** i

Linear extrapolation of curve provider yields

14. If linear extrapolation is necessary to calculate a band Y exact 10-year term to maturity ***YTM*** estimate for the RBA on a specific ***business day*** i, it must be calculated as follows:

$$y_i^{cY} = y_b^{cY} + \left(10 - m_b^{cY}\right)\frac{\left(sts_b^{cY} - sts_a^{cY}\right)}{\left(m_{sts_b}^{cY} - m_{sts_a}^{cY}\right)}, for\ c = RBA$$

Where the ***curve provider*** is the RBA:

a) y_i^{cY} refers to the band Y 10-year ***YTM*** for the RBA on ***business day*** i, which is derived via extrapolation when applying the formula in this clause 14.

b) y_b^{cY} refers to the un-extrapolated band Y ***YTM*** for the longest published ***target tenor***, greater than or equal to 7 years but less than or equal to 10 years on ***business day*** i, sourced in accordance with clause 33

c) sts_b^{cY} refers to the spread to swap rate for the longest published ***target tenor***, greater than or equal to 7 years but less than or equal to 10 years for credit rating band Y on ***business day*** i, sourced in accordance with clause 34

d) sts_a^{cY} refers to the spread to swap rate for the second longest published ***target tenor***, greater than or equal to 7 years but less than or equal to 10 years for credit rating band Y on ***business day*** i, sourced in accordance with clause 34

e) m_b^{cY} refers to the ***effective tenor*** for y_b^{cY}

f) $m_{sts_b}^{cY}$refers to the ***effective tenor*** sts_b^{cY}

g) $m_{sts_a}^{cY}$ refers to the ***effective tenor*** sts_a^{cY}

Note 14: Clause 14 only applies to ***business days*** for which the ***curve provider*** c has published ***YTM*** estimates. In the case of the RBA, they only publish these monthly, so Clause 14 will only apply to the month-end publication ***business day***. These month-end 10 year extrapolated RBA yields will then be used in Clause 17.

15. If linear extrapolation is necessary to calculate a band Y exact 10-year term to maturity ***YTM*** estimate for TR or BVA, the extrapolated ***YTM*** on a specific ***business day*** i must be calculated as follows:

$$y_i^{cY} = y_b^{cY} + \left(10 - m_b^{cY}\right)\frac{\left(y_b^{cY} - y_b^{ADS}\right) - \left(y_a^{cY} - y_a^{ADS}\right)}{\left(m_b^{cY} - m_a^{cY}\right)} + \left(y_{10}^{ADS} - y_b^{ADS}\right), for\ c = TR\ or\ BVA$$

Where the ***curve provider*** is TR or BVA:

(a) y_i^{cY} refers to the band Y 10-year ***YTM*** for ***curve provider*** c on ***business day*** i, which is derived via extrapolation when applying the formula in this clause 15.

(b) y_b^{cY} refers to the un-extrapolated band Y ***YTM*** for ***curve provider*** c for the longest published term to maturity, greater than or equal to 7 years but less than 10 years, on ***business day*** i, sourced in accordance with clause 33

(c) y_a^{cY} refers to the un-extrapolated band Y ***YTM*** for ***curve provider*** c for the second longest published term to maturity, greater than or equal to 7 years but less than 10 years, on ***business day*** i, sourced in accordance with clause 33

(d) m_b^{cY} refers to the term to maturity for y_b^{cY}

(e) m_a^{cY} refers to the term to maturity for y_a^{cY}

(f) y_b^{ADS}refers to the ***ADSWAP YTM*** with a term to maturity, with the same maturity of m_b^{cY}, calculated in accordance with clause 30.

(g) y_a^{ADS} refers to the ***ADSWAP YTM*** with a term to maturity, with the same maturity of m_a^{cY}, calculated in accordance with clause 30.

(h) y_{10}^{ADS} refers to the ***ADSWAP YTM*** with a term to maturity of 10 years, calculated in accordance with clause 30.

Linear interpolation

Calculation of daily CGS or ADSWAP yields using linear interpolation

16. Where linear interpolation is necessary to calculate a daily ***CGS*** or ***ADSWAP YTM*** estimate for a target term to maturity on ***business day*** i, under the conditions specified in clause 29 for ***CGS*** calculations and clause 30 for ***ADSWAP*** calculations. The linearly extrapolated ***CGS*** or ***ADSWAP YTM*** must be calculated as follows:

$$y_i^{\emptyset} = y_a^{\emptyset} + \left(m_i^{\emptyset} - m_a^{\emptyset}\right)\frac{\left(y_b^{\emptyset} - y_a^{\emptyset}\right)}{\left(m_b^{\emptyset} - m_a^{\emptyset}\right)}, for\ \ m_a^{\emptyset} < m_i^{\emptyset} < m_b^{\emptyset}$$

Where:

a) $y_i^{\emptyset}$ refers to the daily ***CGS*** or ***ADSWAP YTM*** estimates for a target term to maturity on ***business day*** i, which is derived via interpolation using this clause 16.

b) $\emptyset$ refers to either ***CGS*** or ***ADSWAP***, depending on which is being calculated in clause 16 a) above.

c) $m_i^{\emptyset}$ refers to the target term to maturity of $\emptyset$ for a specific ***business day*** i

Note 15: For the avoidance of doubt, If extrapolation is required to calculate a 7-year ***ADSWAP YTM*** estimate for ***business day*** i, $m_i^{\emptyset}$ will be 7 years.

d) $y_a^{\emptyset}$ refers to the un-extrapolated ***CGS*** or ***ADSWAP YTM*** for the longest published term to maturity, greater than or equal to $\left|m_i^{\emptyset} - 3\right|$ but less than $m_i^{\emptyset}$ on ***business day*** i, sourced in accordance with clause 32 for ***CGS*** calculations and sourced in accordance with clause 35 for ***ADSWAP*** calculations.

e) $y_b^{\emptyset}$ refers to the un-extrapolated ***CGS*** or ***ADSWAP YTM*** for the shortest published term to maturity, greater than $m_i^{\emptyset}$ on ***business day*** i, sourced in accordance with clause 32 for ***CGS*** calculations and sourced in accordance with clause 35 for ***ADSWAP*** calculations.

f) $\left|m_i^{\emptyset} - 3\right|$ refers to the term to maturity that is 3 years earlier than the target term to maturity.

Note 16: for the avoidance of doubt, if $m_i^{\emptyset}$ is 7 years, then $\left|m_i^{\emptyset} - 3\right|$ will be equal to 4 years.

g) $m_b^{\emptyset}$ is the term to maturity for $y_b^{\emptyset}$

h) $m_a^{\emptyset}$ is the term to maturity for $y_a^{\emptyset}$

Note 17: $m_a^{\emptyset}$ and $m_b^{\emptyset}$ are specific for each ***business day*** i

Calculation of non-daily curve provider spreads

17. Where interpolation is necessary to determine a daily band Y 10-year spread to ***CGS*** for ***curve provider*** c, the non-daily band Y 10-year spread to ***CGS*** for ***curve provider*** c on the publication frequency-end dates under the conditions specified in clause 31 (extrapolated to an exact term to maturity of 10 years in accordance with clause 14 or clause 15, whichever applies, if linear extrapolation is required) must first be converted into a spread to ***CGS*** as follows:

$$stc_F^{cY} = y_F^{cY} - y_F^{CGS}$$

Where:

(a) stc_F^{cY} refers to the non-daily band Y 10-year spread to ***CGS*** for ***curve provider*** c at a particular publication frequency-end date F.

(b) y_F^{cY} refers to the non-daily band Y 10-year ***YTM*** for ***curve provider*** c on the same ***business day*** as the frequency-end publication date in clause 17(a) above. It is sourced in accordance with clause 33 if non-daily band Y 10–year ***YTM***s are observable in the nominated data source, or is calculated in accordance with clause 14 or clause 15, whichever is applicable, if linear extrapolation is required to calculate a non-daily band Y exact 10-year ***YTM***.

(c) y_F^{CGS} refers to y_i^{CGS}estimate for a 10-year target term to maturity on the same ***business day*** as the frequency-end publication date in clause 17(a) above and is calculated in accordance with clause 29.

Note 18: the RBA is currently the only curve provider that does not publish daily ***YTM*** estimates of its curves. When applying this clause 17 to the RBA, the publication frequency-end date is the last ***business day*** on the month-end publication date. If the RBA were to publish its curves at a weekly frequency, The AER would use the last ***business day*** on the week-end publication date.

Note 19: in accordance with the contingency in clause 26 f), if Refinitiv or Bloomberg commences publishing ***YTM*** estimates of a different frequency (eg. monthly or weekly) then interpolation is necessary to obtain daily yield estimates. For this clause 17, c would be TR or BVA, and the publication frequency-end date would become week-end or month-end, depending on the frequency of publication.

Note 20: this clause does not apply in the situation where a ***curve provider*** c publishes daily estimates but there are missing observations as a result of the ***curve provider*** c failing to publish on a single or multiple ***business days***. The contingency Clauses 26(a-b) will apply in this situation.

Calculation of daily curve provider spreads

18. Where interpolation is necessary to calculate a daily band Y 10-year spread to ***CGS*** for ***curve provider*** c on ***business day*** i, the interpolated rate must be calculated as follows:

$$stc_i^{cY} = stc_{Fa}^{cY} + \left(D_i^{cY} - D_{Fa}^{cY}\right)\frac{\left(stc_{Fb}^{cY} - stc_{Fa}^{cY}\right)}{\left(D_{Fb}^{cY} - D_{Fa}^{cY}\right)}$$

Where:

(a) D_i^{cY} refers to the date for which an estimate is being interpolated

(b) D_{Fa}^{cY} refers to the date of the ***curve provider*** c publication frequency-end estimate immediately preceding the interpolation date.

(c) D_{Fb}^{cY} refers to the date of the ***curve provider*** c publication frequency-end estimate immediately following the interpolation date.

(d) stc_i^{cY} refers to the daily band Y 10-year spread to ***CGS*** for ***curve provider*** c, on the same ***business day*** as D_i^{cY} in clause 18(a) above

(e) stc_{Fa}^{cY} refers to the non-daily band Y 10-year spread to ***CGS*** for ***curve provider*** c, on the same ***business day*** as D_{Fa}^{cY} in clause 18(b) above, it is calculated in accordance with clause 17.

(f) stc_{Fb}^{cY} refers to the non-daily band Y 10-year spread to ***CGS*** for ***curve provider*** c, on the same ***business day*** as D_{Fb}^{cY} in clause 18(c) above, it is calculated in accordance with clause 17.

(g) $\left(D_i^{cY} - D_{Fa}^{cY}\right)$ is the number of ***business days*** between D_i^{cY} and D_{Fa}^{cY}

(h) $\left(D_{Fb}^{cY} - D_{Fa}^{cY}\right)$ is the number of ***business days*** between D_{Fb}^{cY} and D_{Fa}^{cY}

Note 21: The publication frequency-end estimates must be assigned to the last ***business day*** of each relevant publication interval.

Note 22: If the annual rate of return on debt estimate must be finalised before a final publication frequency-end estimate is available, the last observed RBA spread to ***CGS*** must be held constant to the end of the ***return on debt averaging period*** which has been determined in accordance with clause 23, clause 24 and clause 25.

Note 23: In accordance with the contingency in clause 26 f), if Refinitiv or Bloomberg commences publishing yield estimates of a different frequency (eg, monthly or weekly), then interpolation is necessary to obtain daily band Y 10-year ***YTM*** estimates. For this clause 18, c would be TR or BVA, and the publication frequency-end date would become week-end or month-end, depending on the frequency of publication.

Calculation of the daily 10-year curve provider yields

19. Where interpolation is necessary to calculate a daily band Y 10-year ***YTM*** for ***curve provider*** c on ***business day*** i; the daily 10-year ***CGS YTM*** , and daily band Y 10-year spread to ***CGS*** for ***curve provider*** c must be combined as follows:

$$y_i^{cY} = stc_i^{cY} + y_i^{CGS}$$

Where:

(a) y_i^{cY} refers to the daily band Y 10-year ***YTM*** for ***curve provider*** c on ***business day*** i, which is calculated via linear interpolation when applying the formula in this clause 19.

(b) stc_i^{cY} refers to the daily band Y 10-year spread to ***CGS*** for ***curve provider*** c on the same ***business day*** i as the ***business day*** date in 19(a), it is calculated in accordance with clause 18.

(c) y_i^{CGS} refers to the daily 10-year ***CGS YTM*** on the same ***business day*** i as the ***business day*** date in 19(a), it is calculated in accordance with clause 29.

Historical average yields

Calculation of the CGS or ADSWAP YTM using a historical average

20. If a historical average is necessary to calculate the daily ***CGS*** or ***ADSWAP YTMs*** with a target term to maturity on ***business day*** i, the following formula applies:

$$y_i^{\emptyset} = \frac{1}{100} \sum_{n(i) \in N(i)^{\emptyset}} y_{n(i)}^{\emptyset}$$

Where:

a) $y_i^{\emptyset}$ refers to the daily ***CGS*** or ***ADSWAP YTM*** estimates for a target term to maturity on ***business day*** i, calculated using historic ***CGS*** or ***ADSWAP YTMs*** averaged over $N(i)^{\emptyset}$

b) $\emptyset$ refers to either ***CGS*** or ***ADSWAP***, depending on which is being calculated in clause 20 a) above.

c) $n(i)$ refers to a specific historical ***business day*** i

d) $N(i)^{\emptyset}$ refers to the period of 100 historical ***business days*** for which a daily ***CGS*** or ***ADSWAP YTM*** can be calculated in accordance with clause 29 (a-c) for ***CGS YTMs*** or clause 30(a-c) for ***ADSWAP YTMs,*** prior to the ***business day*** i for which $y_i^{\emptyset}$ is being calculated in clause 20 a) above.

Note 24: the period $N(i)$ is specific for each ***business day*** i.

e) $y_{n(i)}^{\emptyset}$ refers to the ***CGS*** or ***ADSWAP YTM*** estimate on each ***business day*** $n(i)$ within $N(i)^{\emptyset}$, calculated in accordance with clause 29(a-c).

Calculation of the curve provider YTMs using a historical approach

21. If a historical approach is necessary to calculate the daily band Y 10 year ***YTMs*** for each ***curve provider*** c on ***business day*** i, the following formula applies:

$$y_i^{cY} = \frac{1}{100} \sum_{n(i) \in N(i)^{cY}} sts_{n(i)}^{cY} + y_i^{ADS}$$

Where:

a) y_i^{cY} refers to the daily band Y 10-year ***YTM*** for ***curve provider*** c on ***business day*** i, calculated using a historical spread to swap rate averaged over $N(i)$ and adding to it the ***ADSWAP YTM*** for ***business day*** i .

b) $n(i)$ refers to a specific historical ***business day*** i

c) $N(i)^{cY}$ refers to the period of 100 historical ***business days*** for which a daily band Y 10-year ***YTM*** estimate can be calculated in accordance with clause 31 a) and subclauses 31 b) (i-iii) for ***curve provider*** c prior to the ***business day*** i for which y_i^{cY} is being calculated in clause 21 a) above.

Note 25: the period $N(i)^{cY}$ is specific for each ***business day*** i

d) $sts_{n(i)}^{cY}$ refers to the daily band Y 10-year spread to swap rate for ***curve provider*** c, it is calculated for each specific historical ***business day*** $n(i)$ within $N(i)^{cY}$ in accordance with clause 22.

e) y_i^{ADS} refers to the daily 10-year ***ADSWAP YTM*** calculated on the same ***business day*** i for which y_i^{cY} is being calculated in clause 21a) above, it must be calculated in accordance with clause 30.

Note 26: For the avoidance of doubt, $\sum_{n(i) \in N(i)^{cY}} s_{n(i)}^{cY}$, refers to the sum of the spread to swap rates for each historical ***business day*** $n(i)$ over the 100 historical ***business days*** within $N(i)^{cY}$.

Note 27: For the sake of clarity, if clause 26 b) applies, then the y_i^{cY} calculated in this clause 21 will be used as the daily band Y 10-year ***YTM*** for ***curve provider*** c in clause 12.

Calculation of the spread to swap for curve providers

22. If a daily band Y 10-year spread to swap is required for all ***curve providers*** c in order to calculate daily band Y 10-year ***YTMs*** using a historical approach, the following formula applies:

$$sts_{n(i)}^{cY} = y_{n(i)}^{cY} - y_{n(i)}^{ADS}, for\ all\ n(i) \in N(i)$$

Where:

a) $sts_{n(i)}^{cY}$ refers to the daily band Y 10-year spread to swap rate for ***curve provider*** c on a specific historical ***business day*** $n(i)$, calculated in accordance with this clause.

Note 28: for the avoidance of doubt, in applying this clause, $sts_{n(i)}^{cY}$ will only be calculated for a historical ***business day*** $n(i)$ if a daily 10-year band Y ***YTM*** estimate can be calculated for ***curve provider*** c in accordance with clause 31 a) and subclauses 31 b) (i-iii). In the case where on a historical ***business day*** $n(i)$, a daily band Y10-year ***YTM*** estimate for ***curve provider*** c cannot be calculated in accordance with clause 31 a) and

subclauses 31 b) (i-iii), it will not be used in clause 21 and therefore will not be required to be calculated using this clause 22.

b) $y_{n(i)}^{cY}$ refers to the daily band Y 10-year ***YTM***s for ***curve provider*** c on the same historical ***business day*** $n(i)$as the date used for clause 22a) above and calculated in accordance with clause 31 a) and subclauses 31 b) (i-iii)

c) $y_{n(i)}^{ADS}$ refers to the daily ***ADSWAP YTM*** estimate for a 10-year target term to maturity on the same specific historical ***business day*** $n(i)$ as the date used for clause 22 a) above and is calculated in accordance with clause 30.

Return on debt averaging periods

23. The ***return on debt averaging period*** is:

a) the period nominated by a ***service provider*** to which this instrument is being applied and which satisfies the conditions set out in clause 24[3], whether the period was nominated before or after the commencement of this instrument, or

b) if no period is nominated in accordance with clause 23 a), or a period is nominated that does not meet the conditions set out in clauses 24 for a specific ***regulatory year*** within the ***regulatory control period*** to which this instrument must be applied, a period of 20 consecutive business days in length that finishes 5 ***months*** before the start of the ***regulatory year***.

24. A ***return on debt averaging period*** nominated in accordance with clause 23 a) must:

a) be over a period of 10 or more consecutive ***business days***, up to a maximum of 12 ***months***, and

b) start no earlier than 17 ***months*** prior to the commencement of a ***regulatory year***, and

c) finish no later than 5 ***months*** prior to the commencement of a ***regulatory year***, unless the service provider is specified in clause 25, in which case it must finish no later than 4 months prior to the commencement of a regulatory year, and

d) be specified for each ***regulatory year*** within the ***regulatory control period***, and

e) not overlap for each different ***regulatory year***, although the averaging period is not required to be identical for each ***regulatory year***, and

f) be nominated both:

i. prior to the start of the ***return on debt averaging period***, and

ii. no later than the lodgement date of the regulatory proposal for the regulatory control period.

Note 29: For the avoidance of doubt, the rate of return on debt must be updated annually using the averaging period nominated for each regulatory year.

Note 30: If the start date of any averaging period, nominated in accordance with clause 24 does not fall on a ***business day***, then the start date of the averaging period must be deemed to be the next ***business day***. If the end date of any averaging period,

[3] An averaging period nominated by a service provider is confidential

nominated in accordance with clause 24 does not fall on a ***business day***, then the end date of the averaging period must be deemed to be the previous ***business day***. This is so that clause 24 a) and clause 24c) can be satisfied. However, if the result is such that clause 24a) is not satisfied ie, it results in an averaging period of less than 10 ***business days***, then clause 23b) must apply.

Carve outs for the averaging periods

25. For the purposes of **clause 8 and clause 24 c)**, a service provider is specified if:

a) the service provider is required to nominate its averaging periods prior to the making of the 2022 Rate of Return Instrument; and

b) the AER makes a ***final regulatory determination*** which includes a decision on the nominated averaging periods of the service provider after the making of the 2022 Rate of Return Instrument.

Return on debt contingencies

26. The following contingencies apply to the daily band Y 10-year ***YTM*** estimates for all ***curve providers*** in clause 12.

a) If the data provided by a ***curve provider*** on ***business day*** i cannot be used to calculate either a broad A-rated or broad BBB -rated ***YTM*** estimate in accordance with clause 31 a) and subclauses 31 b) (i-iii). Then y_i^{cY} for the ***curve provider*** band Y on ***business day*** i in clause 12 will not be calculated, and this curve will not be used in the calculation of $y_{i,j}^{d}$ in clause 11, clause 11 will use the remaining data from the ***curve providers***, subject to clause 26 b).

b) This clause applies on a ***business day*** i if the data provided by all ***curve providers*** can not be used to calculate a single band Y daily 10-year ***YTM*** estimate in accordance with clause 31 a) and subclauses 31 b) (i-iii)(such that there is either not a single A-rated, or not a single BBB-rated yield estimate or both):

i. If the data provided by all ***curve providers*** cannot be used to calculate a single A-rated daily 10-year ***YTM*** estimate on ***business day*** i in accordance with clause 31 a) and subclauses 31 b), then the A-rated daily 10-year ***YTM*** estimate for each ***curve provider*** in clause 12 will be calculated using a historical approach in accordance with clause 21, or

ii. If the data provided by all ***curve providers*** cannot be used to calculate a single BBB-rated daily 10-year ***YTM*** estimate on ***business day*** i in accordance with clause 31 a) and subclauses 31 b), then the BBB-rated daily 10-year ***YTM*** estimate for each ***curve provider*** in clause 12 will be calculated using a historical approach in accordance with clause 21, or

iii. If the data provided by all ***curve providers*** cannot be used to calculate a single A-rated and not a single BBB-rated daily 10-year ***YTM*** estimate on ***business day*** i in accordance with clause 31 a) and subclauses 31 b), then the A-rated and BBB-rated daily 10-year ***YTM*** estimate for each ***curve provider*** in clause 12 will be calculated using a historical approach in accordance with clause 21

c) If any ***curve provider*** substitutes its current methodology for a revised or updated methodology to replace the current methodology listed in clause 32, clause 33, clause 34, and clause 35, then the revised or updated methodology must be used to calculate y_i^{cY} for ***business day*** i in clause 12, in accordance with clause 31. The revised or updated methodology can be an entirely new series, not identified in clause 32, clause 33, clause 34, and clause 35, however it must be a replacement after the cessation of the publication of an identified data source.

d) If any ***curve provider*** revises or updates its historical yield estimates, the revised or updated historical yield estimates must not be used to recalculate the allowed rate of return on debt after it has been finalised for any ***regulatory year*** in accordance with clause 9. The allowed rate of return on debt figures will be deemed to be finalised, at the earlier of the following two dates:

i. when the AER notifies the ***service provider*** of the annual estimate, or

ii. eight weeks after the end of the annual averaging period, calculated in accordance with clause 23, clause 24 and clause 25.

e) If the RBA replaces its publication frequency with daily ***YTM*** estimates, then linear interpolation is no longer required to obtain daily ***YTM*** estimates, and so the newly published daily ***YTM*** estimates must be used to calculate y_i^{cY} for ***business day*** i in clause 12, and must be extrapolated to an exact term to maturity of 10 years if necessary, in accordance with clause 14.

f) If either Refinitiv or Bloomberg replaces their publication with a different frequency (eg, monthly yield estimates instead of daily yield estimates), then the new non-daily ***YTM*** estimates must be converted into daily ***YTM*** estimates in accordance with clause 17, clause 18 and clause 19.

Value of imputation credits

27. The value of imputation credits is set at a value of 0.57.

Rounding rules

28. All calculations made pursuant to this instrument must be done in Microsoft Excel or a software program that undertakes equivalent calculations, and must be unrounded.

Ordering of clauses

29. Where a daily 10-year ***YTM*** for a ***CGS*** is required on a specific ***business day*** i, in clause 6, clause 17, clause 19, and a specific historical ***business day*** $n(i)$ in clause 20, the following clauses will apply to the observable data sourced in clause 32, in the following order:

a) If a ***CGS YTM*** with a 10 year term to maturity is observable in the data on ***business day*** i, then the ***YTM*** from this ***CGS*** will be used. If there is not a ***CGS YTM*** with a 10 year term to maturity observable in the data on ***business day*** i, then

b) If there is a ***CGS YTM*** with a longer term to maturity than the target term to maturity, and a ***CGS YTM*** with a shorter term to maturity than the target term to maturity, then the

CGS YTM for a target term calculated in accordance with clause 16 will be used for ***business day*** i. If there is not a ***CGS YTM*** with a longer term to maturity than the target term to maturity and a ***CGS YTM*** with a shorter term to maturity than the target term to maturity on ***business day*** i, then

c) If there are two ***CGS YTMs*** with a term to maturity greater than or equal to 7 years but less than 10 years, then the ***CGS YTM*** for a target term to maturity calculated in accordance with clause 13 will be used for ***business day*** i. If there are not two ***CGS YTMs*** with a term to maturity greater than or equal to 7 years but less than 10 years on ***business day*** i, then

d) A historical average of the ***CGS YTMs*** calculated in accordance with clause 20 will be used as the ***CGS YTM*** estimate for ***business day*** i.

30. Where daily ***ADSWAP YTM*** estimates are required for a target term to maturity on a specific ***business day*** i, in clause 15 and clause 21, and a specific historical ***business day*** $n(i)$ in clause 20 and clause 22, the following clauses will apply to the observable data sourced in clause 35, in the following order:

a) If an ***ADSWAP YTM*** with a target term to maturity is observable in the data on ***business day*** i, then the ***YTM*** from this ***ADSWAP*** will be used. If there is not a ***ADSWAP YTM*** with a target term to maturity observable in the data on ***business day*** i, then

b) If there is an ***ADSWAP YTM*** with a longer term to maturity than the target term to maturity, and an ***ADSWAP YTM*** with a shorter term to maturity than the target term to maturity, then the ***ADSWAP YTM*** estimate calculated in accordance with clause 16 will be used for ***business day*** i. If there is not an ***ADSWAP YTM*** with a longer term to maturity than the target term to maturity and a ***ADSWAP YTM*** with a shorter term to maturity than the target term to maturity on ***business day*** i, then

c) If there are two ***ADSWAP YTMs*** with a term to maturity greater than or equal to 7 years but less than 10 years, then the ***ADSWAP YTM*** calculated in accordance with clause 13 will be used for ***business day*** i. If there are not two ***ADSWAP YTMs*** with a term to maturity greater than or equal to 7 years but less than 10 years on ***business day*** i, then

d) A historical average of the ***ADSWAP YTMs*** calculated in accordance with clause 20 will be used as the ***ADSWAP YTM*** estimate for ***business day*** i.

31. Where 10-year daily band Y ***YTMs*** for ***curve provider*** c are required for a specific ***business day*** i in clause 12, and required for a specific historical ***business day*** $n(i)$ in clause 22, the following clauses will apply to the observable data sourced in clause 33, under the following conditions:

a) If a daily band Y 10-year ***YTM*** for ***curve provider*** c on ***business day*** i, then the ***YTM*** from this data will be used, or

b) If there is not a daily band Y 10-year ***YTM*** for ***curve provider*** c observable on ***business day*** i, then:

i. If a ***curve provider*** c publishes curves in a daily publication frequency, does not publish a band Y 10-year ***YTM*** on ***business day*** i, and publishes two daily band Y ***YTMs*** for greater than or equal to 7 years but less than 10 years on ***business day*** i. Then the daily band Y 10-year ***YTM*** for ***curve provider*** c on

business day i must be calculated using linear extrapolation in accordance with clause 14 or clause 15, whichever applies, or

ii. If a ***curve provider*** c publishes curves in a non-daily publication frequency (i.e. weekly or monthly) and publishes a non-daily band Y 10-year ***YTM*** on the expected publication frequency-end dates immediately prior to and immediately following the ***business day*** i (the relevant publication frequency-end dates). Then the daily band Y 10-year ***YTM*** for ***curve provider*** c on ***business day*** i must be calculated using linear interpolation, in accordance with clause 17, clause 18 and clause 19, or

iii. If a ***curve provider*** c publishes curves in a non-daily publication frequency, does not publish a band Y 10-year ***YTM,*** and does publish two non-daily band Y ***YTMs*** greater than or equal to 7 years but less than 10 years on the relevant publication frequency-end dates. Then the non-daily band Y 10-year ***YTMs*** on the relevant publication frequency-end dates must be calculated using linear extrapolation in accordance with clause 14 or clause 15, whichever applies. These non-daily band Y 10-year ***YTMs*** on the relevant publication frequency-end dates, must then be converted into a daily band Y 10-year ***YTM*** for ***curve provider*** c on ***business day*** i, this must be calculated using linear interpolation in accordance with clause 17, clause 18 and clause 19, or

iv. If a ***curve provider*** c does not publish a 10-year ***YTM*** on ***business day*** i, or the relevant publication frequency-end dates (for non-daily publication intervals), and also does not publish two band Y ***YTMs*** greater than or equal to 7 years but less than 10 years on these days, then contingency clause 26 a) or clause 26 b) will apply.

Note 31: for the avoidance of doubt, in applying clause 31 b) ii. and clause 31 b) iii, if a ***curve provider*** publishes in a non-daily publication frequency and does not publish either a 10-year ***YTMs***, or ***YTMs*** greater than or equal to seven years but less than 10 years on both of its expected publication frequency-end dates immediately prior to and immediately following ***business day*** i. Then these clauses will not be used to interpolate a daily band Y 10-year ***YTM*** estimate for ***curve provider*** c, instead, clause 31 b) iv will apply.

Data sources

32. Data for calculating daily 10-year ***CGS*** yields must be sourced from the RBA's published statistical data, “Indicative Mid Rates of Australian Government Securities – F16”.

a) Data for the ***CGS YTMs*** used to calculate the risk free rate of return in clause 6, clause 13, clause 16 and clause 19, will be sourced by the AER from the RBA on the next ***yield publication day*** after the third ***business days*** after the end of the ***risk free rate averaging period*** determined in accordance with clause 7, clause 8 and clause 25.

b) Data for the calculation of the ***CGS YTMs*** used to calculate the rate of return on debt, in clause 13, clause 16, clause 17 and clause 19 will be sourced by the AER from the RBA on the next ***yield publication day*** that is also a ***business day*** after the 10th day of the month immediately following the month within which the ***return on debt averaging period*** ends, calculated in accordance with clause 23, clause 24 and clause 25.

33. Each ***curve provider's*** yield estimates must be obtained from the following data sources:

a) RBA's broad A-rated and broad BBB-rated yield estimates must be sourced from the RBA's published statistical data, "Aggregate Measures of Australian Corporate Bond Spreads and Yields – F3".

b) Bloomberg broad A-rated yield estimates must be obtained from its BVCSAE index, and its broad BBB-rated yield estimates from its BVCSAB index.

c) Refinitiv broad A-rated yield estimates must be obtained from its AAUDBMK index, and its broad BBB-rated yield estimates from its BBBAUDBMK index.

d) Data for the yield estimates of each curve provider used to calculate the return on debt in clause 12, clause 14, clause 15, clause 17 and clause 22 must be sourced by the AER from each ***curve provider*** c on the next ***yield publication day*** that is also a ***business day*** after the 10th day of the month immediately following the month within which the ***return on debt averaging period*** ends, calculated in accordance clause 23, clause 24 and clause 25.

34. Data for the spread to swap rates must be obtained from the RBA's published statistical data, "Aggregate Measures of Australian Corporate Bond Spreads and Yields – F3".

a) Data for the RBA spread to swap rates used to calculate the return on debt in clause 14 must be sourced by the AER from each ***curve provider*** c on the next ***yield publication day*** that is also a ***business day*** after the 10th day of the month immediately following the month within which the ***return on debt averaging period*** ends, calculated in accordance with clause 23, clause 24 and clause 25.

35. Data for the ***ADSWAP YTM*** estimates must be sourced from Bloomberg's ADSWAP index.

a) Data for the ***ADSWAP YTM*** estimates used in calculate the return on debt in clause 13 and clause 16, must be sourced by the AER from Bloomberg on the next ***yield publication day*** that is also a ***business day*** after the 10th day of the month immediately following the month within which the ***return on debt averaging period*** ends, calculated in accordance with clause 23, clause 24 and clause 25.

Glossary

36. The following terms are defined as follows:

a) ***Access arrangement period*** has the meaning given to it in the National Gas Rules.

b) ***ADSWAP*** refers to the Australian dollar interest rate swap rates sourced from Bloomberg's ADSWAP index

c) ***Allowed rate of return*** refers to the rate of return calculated in accordance with clause 3. It is a nominal vanilla rate of return that is consistent with the value of imputation credits and does not include transaction costs associated with raising capital.

d) ***Business day*** refers to a day that is not:

   a. a Saturday or Sunday; or
   b. a state wide public holiday in New South Wales; or
   c. a bank holiday in New South Wales

e) ***CGS*** refers to Commonwealth Government Securities***.***

f) ***CGS publication days*** refers to ***business days*** on which a ***CGS YTM*** estimate can be calculated in accordance with clause 29(a-c), specifically not including clause 29d).

g) ***Credit rating band*** refers to the broad BBB-based or broad A-based credit rating band published by a curve provider.

h) ***Curve provider*** refers to the Reserve Bank of Australia (RBA), Bloomberg Valuation Service Limited (Bloomberg) or Refinitiv, as relevant.

i) ***Effective tenor*** refers to the effective tenor quoted by the RBA in Statistical Table F03 for the relevant curve and ***Target tenor***.

j) ***Final regulatory determination*** refers to a:

i. distribution determination as per clause 6.11.1 of the National Electricity Rules;

ii. final decision as per clause 6A.13.1 of the National Electricity Rules; or

iii. access arrangement final decision as per rule 62 of the National Gas Rules.

k) ***Target tenor*** refers to the Target tenor quoted by the RBA in Statistical table F03 for the relevant yield curve.

l) ***Term to Maturity*** refers to the quoted term to maturity of the debt curve or ADSWAP quotation, or the remaining life of the debt instrument (in the case of individual instruments)

m) ***Gearing ratio*** refers to the proportion of debt in total financing

n) ***Month*** refers to calendar month.

o) ***Regulated service*** means a direct control network service for the purposes of the National Electricity Law or a reference service for the purposes of the National Gas Law.

p) ***Regulatory control period*** includes a 'regulatory control period' under the National Electricity Rules or an 'access arrangement period' under the National Gas Rules.

q) ***Regulatory proposal*** includes a service provider's regulatory proposal or revenue proposal under the National Electricity Rules or access arrangement proposal under the National Gas Rules. It does not include a revised regulatory proposal, revised revenue proposal or revised access arrangement proposal.

r) ***Regulatory year*** refers to: ~~to~~

i. each consecutive period of 12 months in a regulatory control period, the first such 12 month period commencing at the beginning of the regulatory control period and the final 12 month period ending at the end of the regulatory control period; and ~~.~~

ii. For regulated service providers that have had a regulatory control period extended by six months to facilitate the move from calendar regulatory years to financial regulatory years, the first 5 consecutive 12 month periods in this regulatory control period and the regulatory control extension period from 1 January - 30 June of the year following the first 5 consecutive 12 month periods in this regulatory control period.

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s) ***Return on debt averaging period*** refers to an averaging period determined in accordance with clause 23 and clause 24 and clause 25.

t) ***Risk free rate averaging period*** refers to an averaging period determined in accordance with clause 7, clause 8 and clause 25.

u) ***Service provider*** means a network service provider for the purposes of the National Electricity Law or a service provider for the purposes of the National Gas Law.

v) ***Trailing average portfolio approach*** refers to the return on debt approach of using the average of the return on debt for each regulatory year over a period of ten years.

w) ***Transition period*** refers to the period commencing at the start of the first regulatory year for which the return on debt is calculated using a trailing average for the first time for the relevant regulated service and ends when the return on debt for a ***regulatory*** year is calculated using the average of the on-the-day rate of return on debt over a period of 10 regulatory periods with 10 per cent weighting to each period~~after 10 regulatory years~~.

x) ***Yield publication day*** means the ***business day*** on which the specific data source publishes its data.

y) ***YTM*** refers to the yield to maturity of a financial instrument, or to the quoted yield to maturity of a curve provider.