Jemena Gas Networks (NSW) Ltd

2020-25 Access Arrangement Proposal

Attachment 6.6

Debt transaction costs and PTRM timing benefits

Debt transaction costs

and PTRM timing benefits

Dr. Tom Hird

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1 Executive summary

1.1 Debt management costs

1. We have estimated debt raising and liquidity management costs for JGN as set out in the following table.

Table 1-1: Total debt raising transaction costs ($m and bppa)

	2020-21	2021-22	2022-23	2023-24	2024-25
AER debt raising transaction costs (DRT, $m)	1.82	1.88	1.94	2.00	2.05
CEG DRT incremental to AER DRT ($m)	1.25	1.29	1.34	1.38	1.41
Debt raising transaction costs for debt component of RAB ($m)	**3.07**	**3.18**	**3.28**	**3.38**	**3.46**
Liquidity - commitment fee ($m)	0.93	1.02	1.09	1.11	1.12
3 month ahead financing costs ($m)	1.24	1.28	1.33	1.37	1.40
Total debt raising transaction costs ($m)	**8.30**	**8.65**	**8.98**	**9.25**	**9.44**
AER debt raising transaction costs (bppa)	9.05	9.05	9.05	9.05	9.04
CEG DRT incremental to AER DRT (bppa)	6.23	6.23	6.23	6.23	6.23
Debt raising transaction costs for debt component of RAB (bppa)	**15.28**	**15.28**	**15.28**	**15.28**	**15.27**
Liquidity - commitment fee (bppa)	4.66	4.90	5.08	5.02	4.95
3 month ahead financing costs (bppa)	6.17	6.17	6.17	6.17	6.17
Total debt raising transaction costs (bppa)	**26.11**	**26.36**	**26.54**	**26.48**	**26.40**
Levelised debt raising transaction costs for debt component of the RAB (bppa)	**15.28**				
Levelised debt raising transaction costs (bppa)	**26.38**				

1.2 Arrangement fee and debt raising transaction costs

2. Our estimate of debt raising transaction costs of around 9.04-9.05 bppa as shown in Table 1-1 follows the AER precedent with the exception that we have obtained our sample of bonds with arrangement fees based on bonds with a Bloomberg designated "country of risk" that is "Australia". This leaves us with 6 bonds issued by 3 companies over the 5 year periods from 1 April 2013 to 1 April 2018 (BHP, Rio Tinto and Toyota).

3. However, when examining the application of the AER method we noticed that there are a number of high outliers when it comes to arrangement fees paid by bond issuers.

The AER's method has been to exclude these outliers and only derive its estimate based on the lower end of the observed arrangement fees.

4.   In this report we have examined whether there is any explanation for the existence of outliers and have found that there is a strong positive relationship between the arrangement fees paid to underwriters and the subsequent loss, relative to the issue price, made by underwriters when selling those bonds to the public.

5.   Specifically, the underwriting fee recorded in the prospectus is expressed as a percentage of the nominated issue price in the prospectus. However, there is no guarantee that an underwriter will be able to sell the bonds to the public at the issue price.

6.   Our analysis suggests that when underwriters appear to be paid a high discount relative to the prospectus nominated issue price this is invariably because they are unable to sell the bonds to the public at that nominated issue price. This tends to explain the mystery associated with the high outliers in arrangement fees – these overstate the true compensation that underwriters receive because the high estimates rest on an incorrect assumption that underwriters are able to sell the bonds at the issue price listed in the prospectus. In reality, in all but two cases the average price over the five days post issue was lower than the issue price for bonds with high (greater than 20 bppa) arrangement fees.

Figure 1-1: Issue price less trading price vs prospectus arrangement fee
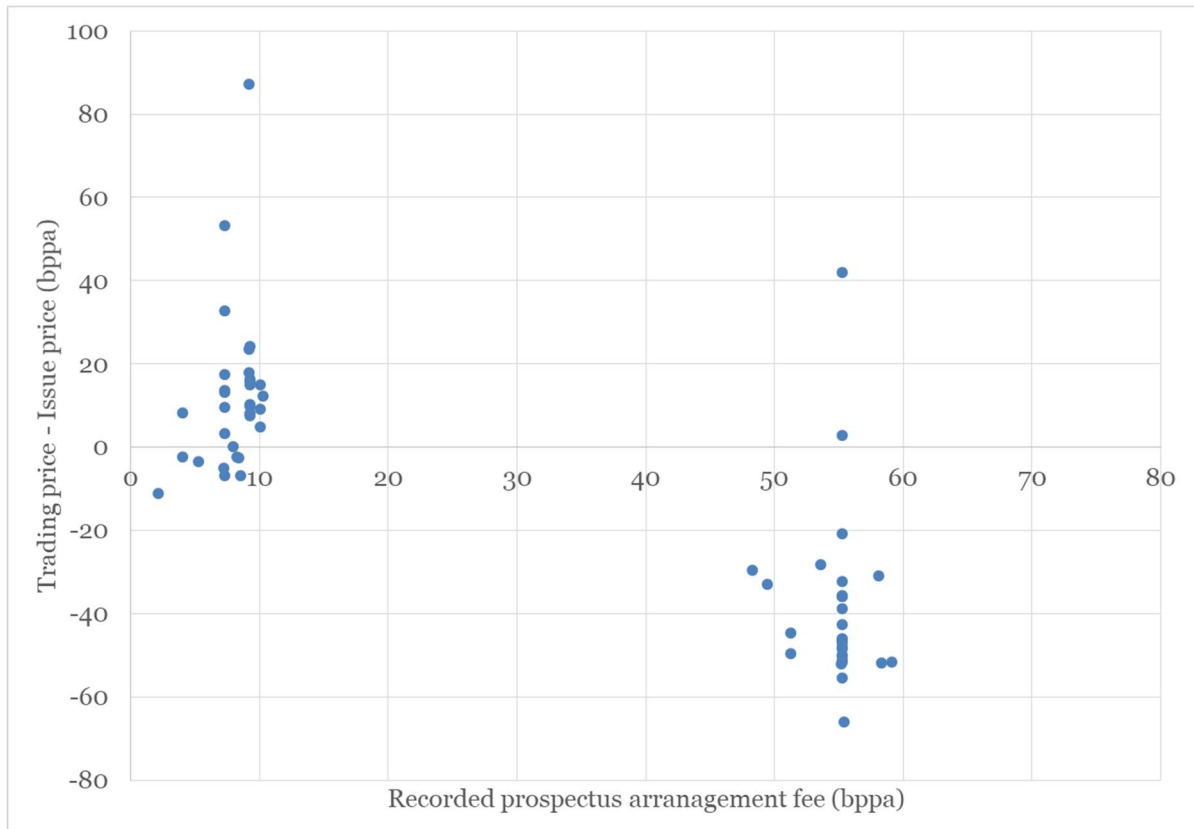
Source: Bloomberg. Sample is all bonds issued from 1 April 2008 to 1 April 2018 where the issuer has country of incorporation as Australia, has a S&P credit rating and is not in the finance industry. Trading price is the average trading price in the first five days of trading.

7. Unless the arrangement fee is adjusted to account for the fact that the bonds are not sold at the issue price then the AER's practice of excluding the high arrangement fee bonds is appropriate. This is because these fees, measured relative to the 'issue price' recorded in the prospectus clearly do not represent a true cost to the issuer because the issuer could not realistically expect to sell the bonds at the 'issue price'.

8. However, it is also the case, as can be seen from Figure 1-1, that bonds that have 'normal' arrangement fees tend to have been traded at a higher price than the 'issue price'. Thus, while the high prospectus arrangement fee observations tend to overstate the issuance cost the opposite is true of the low prospectus arrangement fee observations. The low arrangement fee observations tend to understate the underwriters' compensation because they do not capture the fact that the underwriter tends to sell the bonds at a higher price than the 'issue price' listed in the prospectus – and that this is an important element of the compensation provided to them for their role.

9. When we include an adjustment for the difference between recorded 'issue price' and actual trading prices at issue[1] then we find that what appears to be two very different samples (high and low prospectus arrangement fees) are actually drawn from the same distribution (i.e., have a very similar distribution of adjusted arrangement fees).

10. This can be seen in Figure 1-2 below. Here we continue to plot the data using the same prospectus arrangement fee on the horizontal axis but now plot the arrangement fee adjusted for the difference between prospectus 'issue price' and actual traded prices immediately after issue on the vertical axis. It can be seen that the distribution of the adjusted arrangement fees are now almost identical. This a very strong result suggesting that the adjusted arrangement fee is the economically meaningful measure of the compensation to the underwriter.

Figure 1-2: Adjusted vs prospectus arrangement fee

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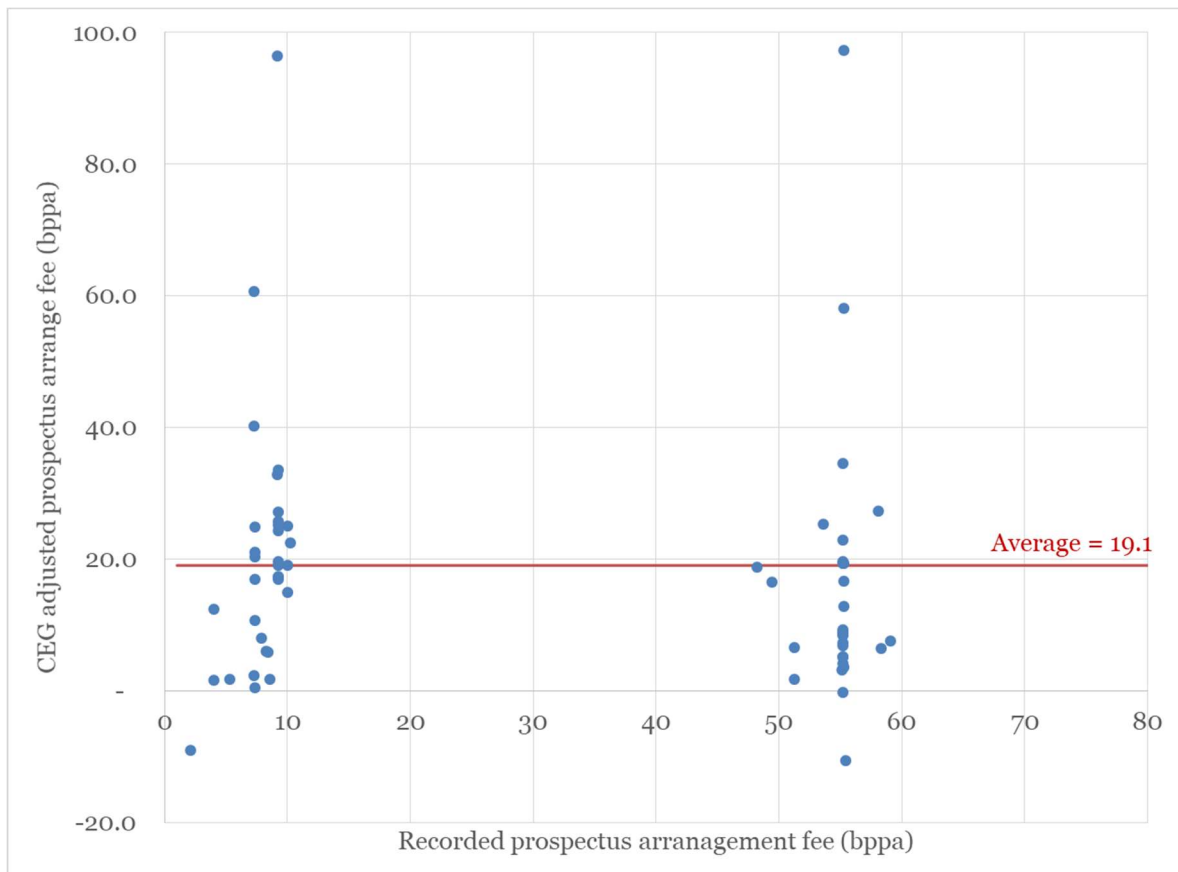
[1] The adjustment is based on average trading price in the first five trading days less the issue price (annualised by tenor in the same way that the difference between the recorded "issue price" and the underwriter's discounted price is annualised to arrive at the recorded Bloomberg fee in bppa). Our findings do not change materially if the averaging period is changed to ten or fifteen days.

11. This variation reflects in part the outcome of risk that the underwriter takes on when undertaking to buy and on-sell the bonds. However, the average of this compensation is the best estimate of the average expected cost anticipated by underwriters. In the above sample the average is 19.1 bppa as indicated by the red horizontal line in line in Figure 1-2 above.

12. However, the above sample is for issuers who have a country of incorporation that is Australia. We consider that the best estimate (subject to sample size availability) is for issuers who have a country of risk that is Australia. When we restrict ourselves to this sample the average underwriting cost is **14.09 bppa** comprised of **7.86 bppa** prospectus arrangement fee plus an additional **6.23 bppa** in compensation paid to underwriters.

Table 1-2: Adjustment to the arrangement fee (2013-2018 Sample)

Ticker	Company	Recorded Bloomberg fee (bppa)	Adjustment* (bppa)	Total cost (bppa)
EJ855336 Corp	BHP	10.04	4.89	14.93
EJ855348 Corp	BHP	9.23	9.83	19.06
EJ855408 Corp	BHP	9.28	15.92	25.20
EK326300 Corp	Toyota	4.01	8.33	12.35
AL294873 Corp	Toyota	7.25	-4.91	2.34
EK974172 Corp	Rio	7.32	3.34	10.66
Average		**7.86**	**6.23**	**14.09**

Source: Bloomberg, CEG analysis. Note: The adjustment is based on average trading price in the first five trading days less the issue price (annualised by tenor in the same way that the difference between the recorded "issue price" and the underwriter's discounted price is annualised to arrive at the recorded Bloomberg fee in bppa). Our findings do not change materially if the averaging period is changed to ten or fifteen days.

1.3 Liquidity management costs

13. We have also included in Table 1-1 an estimate of around 11 bppa in debt management costs relating to managing liquidity and refinance risk (see sections 3.2 and 3.3 respectively). The AER has, in previous decisions, accepted that these costs are efficiently incurred and that they must be incurred in order to meet the requirements of credit rating agencies to achieve an investment grade credit rating.

14. However, the AER has rejected providing an additional amount in the debt raising allowance on the grounds that the timing benefits in the PTRM are sufficiently large to fully compensate for these costs.

15. The AER contends in its draft decision for Transgrid and more recently in the recent Draft rate of return guideline explanatory statement, that the timing benefits are in excess of 1.8% of total revenue. The AER reached this conclusion based on a report

by ACG in 2002 that estimated the value of timing benefits to be around 1.8% for Epic Energy. However, the AER notes that since that time the PTRM has been adjusted to apply a half year WACC to capex when it enters the RAB. The AER correctly notes that the effect of this is to raise the level of timing benefits:[2]

> *In 2007, we identified that the PTRM has been modified since the 2002 ACG report to recognise capex in the middle of each year, while still assuming revenues are received on the last day of the year. In practice, this modification means that we add an additional half year of WACC to all capex in the year that it enters the capital base, in order to adjust for the time value of money. Service providers recover this incremental addition through increased depreciation and by increased return on capital while the capex is being depreciated. While strictly related to capex timing, this change further benefits the service provider and heightens the favourable cash-flow timing assumptions in the PTRM. This means that the level of the favourable 'bias' in the PTRM is in our view now greater than what was estimated by ACG in 2002. For these reasons we consider there is no need for an additional explicit allowance for liquidity costs, as service providers are already implicitly and sufficiently compensated for such costs.*

16. The AER has applied the ACG 1.8% of revenue figure to a recent decision for AusNet Services' electricity distribution PTRM for 2016-20. Doing so the AER states:

> *Using ACG's initial estimate of 1.8 per cent of revenue as upward bias in the PTRM's timing assumptions is equivalent to increasing the estimated return on debt by approximately 46 basis points applied to the full regulatory asset base as opposed to only a subset of the instruments. This estimate does not take account adjustments to the PTRM to add a half year of WACC to all capex, and so may materially understate the favourable upward bias from PTRM timing assumptions.*

17. The AER then uses the above line of reasoning to assert that the favourable timing allowances actually overcompensate the required working capital allowances, and has on various occasions used this claim to support its refusal to provide compensation on other regulatory costs, such as up-front fees for financing debt:[3]

> *We have in the past rejected those fees on the basis that the favourable timing allowances in the PTRM (designed to account for working capital or liquidity) swamp the magnitude of those proposed allowances.*

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[2]   AER, Draft decision– TransGrid transmission determination– Attachment 3: Rate of return, November 2014, pp. 329-330; Referenced in: AER, Rate of return Draft Guidelines: Explanatory Statement, Draft, July 2018, pp. 457-458.

[3]   AER, Rate of return Draft Guidelines: Explanatory Statement, Draft, July 2018, p. 456.

18.   While it is true that ACG's 1.8% of revenue estimate does not capture the change to the PTRM treatment of capex, this effect is partially negated by the fall in JGN's WACC since ACG's 2002 report (from 7.14% real pre-tax WACC used by ACG to JGN's 2.91% real pre-tax WACC). When account is taken of the fall in JGN's WACC, the value of timing benefits can be much smaller than estimated by ACG.[4]

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[4]   Under certain simplifying assumptions, the bias can be approximated by the following formula under the PTRM framework that applied at the time of ACG's report:

$$Bias_t = (Depr_t + RoC_t)\left(1 - \frac{1}{\sqrt{1 + WACC_t}}\right)$$

Under the updated PTRM that treats capex as occurring in the middle of the year, the approximate bias equation changes to:

$$Bias_t = (Depr_t + RoC_t)\left(1 - \frac{1}{\sqrt{1 + RWACC_t}}\right) + Capex \times \left(\frac{\sqrt{1 + VWACC_t}}{\sqrt{1 + RWACC_t}} - 1\right)$$

2   Introduction

19.   I have been asked by JGN to provide a report advising on the best estimate of JGN's debt raising costs that make up one of the inputs of the PTRM, and to evaluate the AER's method for implicitly deriving the working capital allowance that JGN should be compensated for in accordance with the findings of a report by Allen Consulting Group (ACG) in 2002.

20.   The remainder of this report has the following structure:

   ▪   **Section 3** calculates JGN's debt raising costs based on our approach that modifies the methods set out in PwC (2013) and Incenta (2014);[5]

   ▪   **Appendix A** describes the role of working capital in regulation;

   ▪   **Appendix B** explores approaches that other Australian regulators have used for estimating explicit allowances for the return on working capital.

21.   I acknowledge that I have read, understood and complied with the Federal Court of Australia's Practice Note CM 7, "Expert Witnesses in Proceedings in the Federal Court of Australia". I have made all inquiries that I believe are desirable and appropriate to answer the questions put to me. No matters of significance that I regard as relevant have to my knowledge been withheld.

22.   I have been assisted in the preparation of this report by Johnathan Wongsosaputro and Yang Hao in CEG's Sydney office. However, the opinions set out in this report are my own.

Thomas Nicholas Hird

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[5]   PwC, Energy Networks Association: Debt financing costs, June 2013; Incenta, Debt raising transaction costs: Jemena Gas Networks, June 2014.

3 Allowance for costs associated with S&P requirements

23. Standard and Poor's (S&P) imposes a number of financial requirements that businesses must demonstrate in order to maintain certain credit ratings. According to PwC (2013), these requirements include:[6]

   - Direct costs: Transaction costs on debt component of the RAB;

   - Indirect costs:

      ▫ Maintaining a liquid reserve in excess of known funding requirements; and

      ▫ Requirement to finance 3 months ahead of the refinancing date.

24. The PwC (2013) report sets out a method for estimating the magnitude of such costs, based on the assumption that the service provider maintains 3-year bank debt facilities,[7] which is an assumption retained by Incenta (2014) for the purpose of estimating JGN's debt raising transaction costs.[8] We retain this assumption for our own calculations.

25. In this section we implement PwC's (2013) approach as applied by Incenta (2014), but with the following modifications:

   i. Table 3 of Incenta's (2014) report includes an entry for "Debt repayments". We have calculated this parameter using 5% of the debt component of opening RAB in each year. This represents the six-monthly quantity of debt that must be refinanced under a 10-year trailing average approach.

   ii. Whenever Incenta (2014) refers to the "Bloomberg 3 year BBB yield" in Table 4 and Table 9 of their report, we instead use the BVAL 3 year BBB+ yield, which is obtained as a weighted average between the BVAL 3-year BBB yield (BVSCAB03 Index; 2/3 weight) and the BVAL 3-year A yield (BVSCAE03 Index; 1/3 weight). This modification was made in order to maintain consistency with the AER's updated Guideline approach for estimating the BBB+ benchmark cost of debt;

   iii. Instead of annualising upfront establishment fees and other bank transaction costs by annualising with a 10% discount rate in Table 6 of Incenta's (2014) report, we use JGN's proposed 5.16% nominal vanilla WACC as the discount rate;

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[6]   PwC, Energy Networks Association: Debt financing costs, June 2013, pp. i-ii.

[7]   PwC, Energy Networks Association: Debt financing costs, June 2013, p. 20.

[8]   Incenta, Debt raising transaction costs: Jemena Gas Networks, June 2014.

iv. Incenta (2014) follows PwC's (2013) preferred approach for estimating the cost of bond re-financing 3 months ahead, where the interest cost on the new bond is offset by returns on BBB credit rated interest income. We instead use PwC's (2013) alternative methodology where it is assumed that the business invests the refinanced amount into in bank accepted bills at BBSW for 3 months;[9]

v. Table 10 of Incenta's (2014) report derives the "maturing component of debt portfolio" with reference to JGN's RAB from 10 years back. We instead use 10% of the debt component of the opening RAB in each regulatory year as a proxy for the amount of existing debt that needs to be refinanced in said regulatory year. This modification is reflective of the AER's adoption of the trailing average approach for calculating the annual return on debt; and

vi. We include a 6.23 bp adjustment in our final estimate in order to account for compensation paid to underwriters.

26. Table 3-1 provides a summary of our approach for estimating JGN's debt raising costs. Using our modified approach, we obtain a debt raising transaction cost estimate of **26.4 basis points per annum**, averaged over the 2020-25 regulatory cycle.

Table 3-1: Summary of methodology for estimating debt raising costs

Categories of debt raising costs	Sub-categories	Calculation	Section
Cost associated with debt component of RAB	Arrangement fee	Assessment of arrangement fees for a sample of 6 bonds that fulfil certain criteria	3.1.1
	Overarching fees when issuing debt	Obtain from PwC (2013) and convert into bppa	3.1.2
	Costs specific to individual debt	Obtain from PwC (2013) and convert into bppa	3.1.2
Cost of maintaining liquid reserve	Commitment fee	(50% of 3 year BBB+ to 3 year swap rate margin) × (Liquidity reserve requirement derived from modified Incenta (2014) bottom-up approach)	3.2.1
	Direct transaction cost	Obtain from PwC (2013) and convert into bppa	3.2.2
Cost of financing 3 months ahead	Cost of financing 3 months ahead	(3 month nominal pre-tax cost of debt – 3 month BBSW) × (10% of regulatory debt)	3.3

3.1 Direct cost: Debt raising transaction costs

27. PwC's (2013) method for estimating direct costs involves the following components:

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[9]   See: PwC, Energy Networks Association: Debt financing costs, June 2013, p. 23.

- Arrangement fee;

- Other debt raising transaction costs:

    □ 'Overarching' fees that apply whenever a business issues debt; and

    □ Costs that are specific to the individual debt issue.

3.1.1 Arrangement fee

28. Based on data from 2008 to 2013, PwC (2013) concluded that Australian companies incurred 8.5 bppa in arrangement fees when issuing corporate bonds in the US market. This estimate was invariant to factors such as issue size, term at issuance and credit rating.

29. The AER's estimates of arrangement fees have varied across its decisions, presumably as a result of updating PwC's (2013) approach. We have followed this precedent with the exception that we have obtained our sample of bonds with arrangement fees based on bonds with a Bloomberg designated "country of risk" that is "Australia". This leaves us with 6 bonds issued by 3 companies over the 5 year period from 1 April 2013 to 1 April 2018 (BHP, Rio Tinto and Toyota).

30. Specifically, we first collect our sample from Bloomberg using the following criteria, resulting in a sample with 76 bonds (full sample):

- Issued during 1st April 2008 and 1st April 2018;

- Country of risk, domicile or incorporation is in Australia;

- Not issued by financial institutions because they operate in a specific market separate to the corporate bond market (PwC);

- Arrangement fee is available; and

- Non-convertible bonds (convertible bonds are excluded because they have equity-like characteristics, and therefore have an issuance cost structure that closely resembles equity issuance (PwC)).

31. We then further restrict the sample using the following criteria and identify the 6 bonds (short sample) shown in Table 3-2 that have the following characteristics:

- Issued during 1st April 2013 and 1st April 2018 (the most recent 5 year period ending 1 April 2018);[10]

- Issued at investment grade; and

- Credit rating available from Standard & Poor's.

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[10] PwC (2013) used 1 April 2008 to 1 April 2013 as its averaging period. Our updated estimates carry on from their averaging period by using the subsequent five-year period from 1 April 2013 to 1 April 2018.

32. However, when examining the application of the AER method we noticed, consistent with PwC's own analysis, that there are a number of high outliers when it comes to arrangement fees paid by bond issuers. The AER's method has been to exclude these outliers and only derive its estimate based on the lower end of the observed arrangement fees.

33. In this report we have examined whether there is any explanation for the existence of outliers and have found that there is a strong positive relationship between the arrangement fees (relative to recorded 'issue price') paid to underwriters and the subsequent loss, relative to the recorded 'issue price', made by underwriters when selling those bonds to the public.

34. Specifically, the underwriting fee recorded in the prospectus is expressed as the discounted percentage of the nominated issue price in the prospectus (i.e., the discount the underwriter pays for the bonds relative to the recorded issue price). However, there is no guarantee that an underwriter will be able to sell the bonds to the public at the recorded issue price.

35. Our analysis suggests that where underwriters appear to be paid a high discount relative to the issue price this is almost always because the bonds trade at a discount to the issue price immediately after issuance. This tends to explain the mystery associated with the high outliers in arrangement fees – these overstate the true compensation that underwriters receive because the implicit assumption that they are able to sell the bonds at the issue price is not correct. In reality, in all but two cases the average price over the five days post issue was lower than the issue price for bonds with 'outlier' (greater than 20 bppa) recorded prospectus arrangement fees.[11]

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[11] Changing the averaging period to 10 days or 15 days does not have a material impact on our results.

Figure 3-1: Issue price less trading price vs prospectus arrangement fee
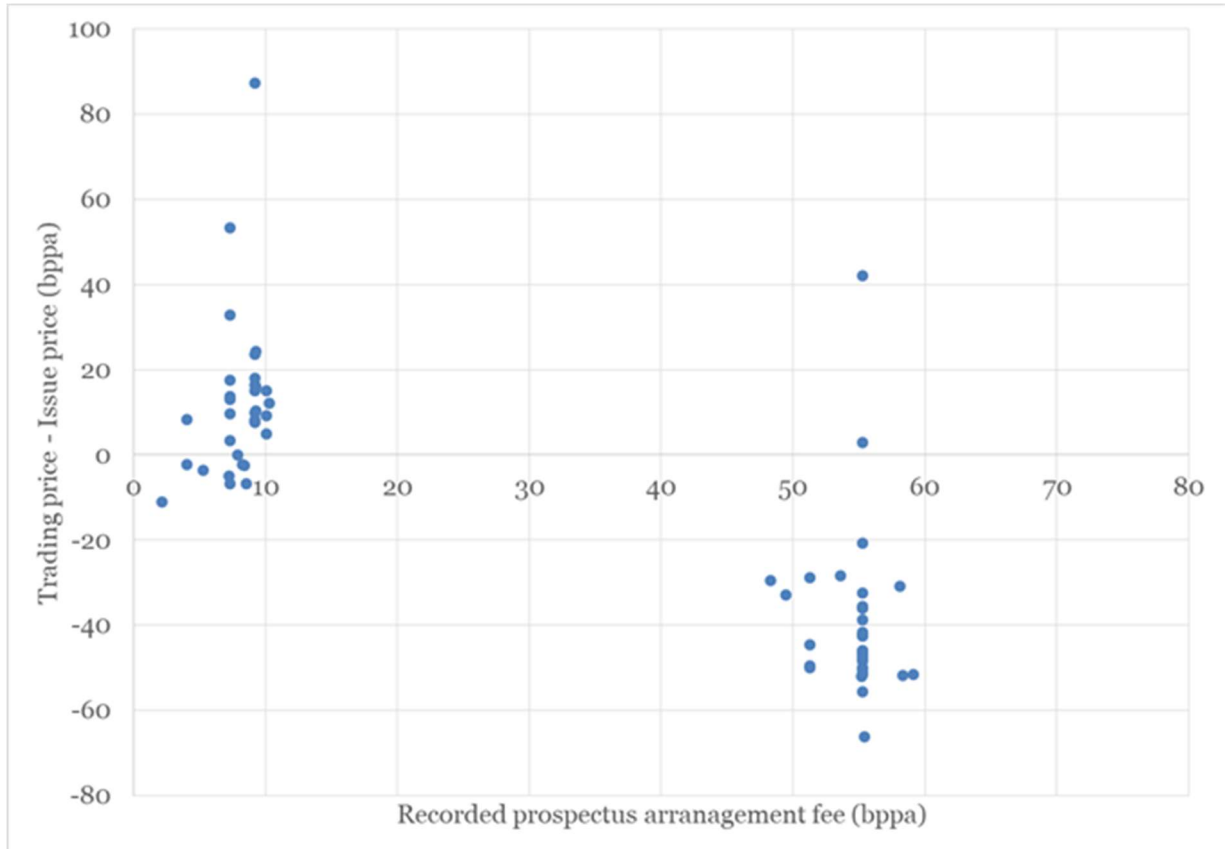
Source: Bloomberg. Sample is all bonds issued from 1 April 2008 to 1 April 2018 where the issuer has country of incorporation as Australia, has a S&P credit rating and is not in the finance industry. Trading price is the average trading price in the first five days of trading.

36. Unless the arrangement fee is adjusted to account for the fact that the bonds are not sold at the issue price then the AER's practice of excluding the high arrangement fee bonds is appropriate. This is because these 'fees', measured relative to the 'issue price' recorded in the prospectus clearly do not represent a true cost to the issuer because the issuer could not realistically expect to sell the bonds at the prospectus 'issue price'.

37. However, it is also the case, as can be seen from Figure 3-1, that bonds that have 'normal' arrangement fees tend to have been traded at a higher price than the 'issue price'. While it is true that the high prospectus arrangement fee observations tend to overstate the issuance cost the opposite is true of the low prospectus arrangement fee observations – these observations tend to understate the compensation paid to the underwriter because they do not capture the fact that the underwriter tends to sell the bonds at a higher price than the issue price – and that this is an important element of the compensation provided to them to compensate for the costs of underwriting.

38. When we include an adjustment for the difference between recorded 'issue price' and actual trading prices at issue then we find that what appears to be two very different samples (high 'outlier' and low 'normal' prospectus arrangement fees) are actually drawn from the same distribution (i.e., have a very similar distribution of adjusted arrangement fees).

39. This can be seen in Figure 3-2 below. Here we continue to plot the data using the same prospectus arrangement fee on the horizontal axis but now plot the adjusted arrangement fee on the vertical axis. It can be seen that the distribution of the adjusted arrangement fees are now almost identical. This a very strong result suggesting that the adjusted arrangement fee is the economically meaningful measure of the compensation to the underwriter.

Figure 3-2: Adjusted vs prospectus arrangement fee
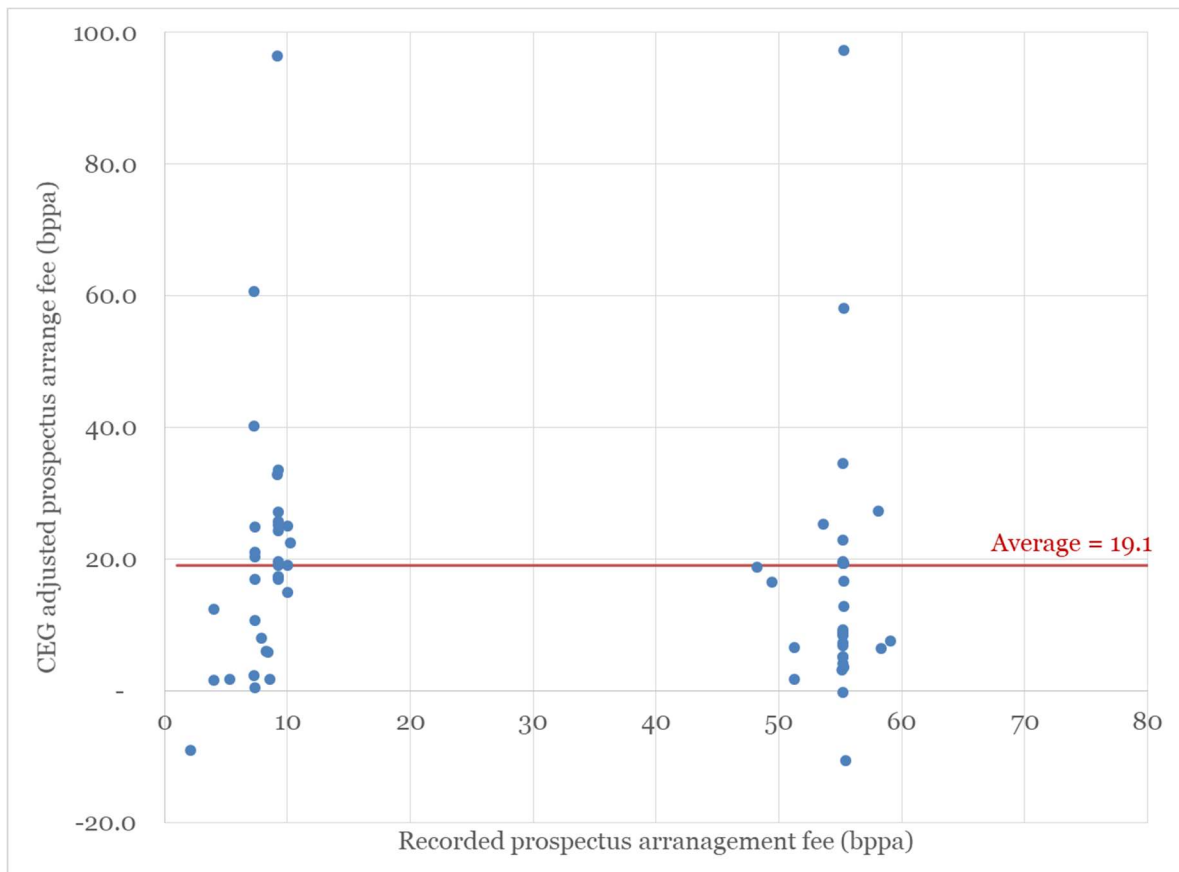
40. This variation reflects in part the outcome of risk that the underwriter takes on when undertaking to buy and on-sell the bonds. However, the average of this compensation is a good estimate of the average expected cost anticipated by underwriters. In the above sample the average is 19.1 bppa as indicated by the red horizontal line in line in Figure 3-2 above.

41. However, the above sample is for issuers who have a country of incorporation/domicile or risk that is Australia. We consider that that the most relevant bonds are those where the issuer has a Bloomberg designated "country of risk" that is "Australia". This is consistent with how the published yield providers relied on by the AER (Bloomberg, RBA and Reuters) arrive at their sample for estimating the cost of corporate debt.

42. This leaves us with 6 bonds issued by 3 companies over the 5 year periods from 1 April 2013 to 1 April 2018 (BHP, Rio Tinto and Toyota). When we restrict ourselves to this sample the average underwriting cost is **14.09 bppa** comprised of 7.86 bppa prospectus arrangement fee plus an additional 6.23 bppa in compensation paid to underwriters.

43. For ease of comparison, we only include the **7.86 bppa** prospectus arrangement fee for our calculations in section 3.1.2, but further include the additional **6.23 bppa** for our final debt-raising transaction cost estimates in section 3.4.

Table 3-2: Adjustment to the arrangement fee (2013-2018 Sample)

Ticker	Company	Recorded Bloomberg fee (bppa)	Adjustment* (bppa)	Total cost (bppa)
EJ855336 Corp	BHP	10.04	4.89	14.93
EJ855348 Corp	BHP	9.23	9.83	19.06
EJ855408 Corp	BHP	9.28	15.92	25.20
EK326300 Corp	Toyota	4.01	8.33	12.35
AL294873 Corp	Toyota	7.25	-4.91	2.34
EK974172 Corp	Rio	7.32	3.34	10.66
Average		**7.86**	**6.23**	**14.09**

Source: Bloomberg, CEG analysis. Note: The adjustment is based on average trading price in the first five trading days less the issue price (annualised by tenor in the same way that the difference between the recorded "issue price" and the underwriter's discounted price is annualised to arrive at the recorded Bloomberg fee in bppa).

3.1.2   Other debt raising transaction costs

44. PwC (2013) identified two 'overarching' fees that must be paid to the credit rating agency:

- Initial credit rating: $77,500 per issue;
- Annual surveillance: $35,500 per annum.

45. In addition, PwC (2013) identified other costs that are specific to the bond issue. These are shown in Table 3-3, which reproduces Table 4.2 of their report.

Table 3-3: Other bond issuance transaction costs – PwC (2013) Table 4.2

	Unit	Estimated value	Source
Legal counsel – Master program	Per ten years	$56,250	Legal firms
Legal counsel – Issuer's	Per issue	$15,625	Legal firms
Credit rating agency – Up front bond issue	Per issue	5.2 bps of issue size	Rating agencies
Registrar – Up front	Per ten years	$20,850	Banks
Registrar – Annual	Per annum per issue	$7,825	Banks
Investment bank's out of pocket expenses	Per issue	$3,000	Estimated

3.1.3 Total direct cost

46. In accordance with PwC's (2013) approach, based on an arrangement fee of 7.86 bppa and excluding the adjustment set out in Table 3-2 above, we obtain total debt raising transaction costs of **9.0-9.1 bppa** for JGN's 2020-25 regulatory cycle as shown in Table 3-4. However, including the adjustment set out in Table 3-2 adds 6.23 bppa. We use JGN's nominal vanilla WACC of 5.16% to discount each fee.

47. Our estimates assume 9 bond issues of $250 million each in 2020-24, and 10 bond issues in 2024-25. These correspond to the debt component of JGN's nominal RAB for each of those regulatory years.

Table 3-4: Benchmark debt raising costs (bppa)

| Number of bonds issued | | 1 | 9 | 10 |
| Issue amount | | 250,000,000 | 2,250,000,000 | 2,500,000,000 |
Applicable regulatory years*		-	2020-21	2021-24
Arrangement fee	7.86	7.86	7.86	7.86
Bond Master Program (per program)	$56,250	0.30	0.03	0.03
Issuer's legal counsel	$15,625	0.08	0.08	0.08
Company credit rating	$77,500	0.41	0.04	0.04
Annual surveillance fee	$35,500	0.14	0.02	0.01
Up-front issuance fee	5.2	0.69	0.68	0.68
Registration up-front (per program)	$20,850	0.11	0.01	0.01
Registration-annual	$7,825	0.31	0.31	0.31
Agents out-of-pockets	$3,000	0.02	0.02	0.02
Total (bppa) before adjustment		**9.9**	**9.1**	**9.0**
Total (bppa) after adjustment to arrangement fee		**16.1**	**15.3**	**15.3**

We determine the number of bonds that are required to be issued based on the debt component of the opening RAB for each regulatory year, assuming that bonds are issued in increments of $250 million. For example, the debt component of the 2020-21 opening RAB is $2.005 billion, which corresponds to 9 bonds.

3.2 Indirect cost: Maintaining a liquid reserve

48. PwC (2013) classifies the cost of maintaining liquidity reserves into the following two components:

- **Commitment fees** paid to financiers for keeping funds available should the borrower request it; and

- **Direct transaction costs** such as upfront fees required to be paid to financiers, arranging fees, credit agency fees, and legal fees.

3.2.1 Commitment fees

49. Total commitment fees can be obtained as a product of the bppa commitment fee and the amount of undrawn bank lines required to be maintained as a liquidity reserve.

3.2.1.1   *Benchmark rate on commitment fees*

50.   PwC (2013) obtains the benchmark commitment fee as 50% of the margin between the 3-year BBB yield and the AUD 3-year swap rate. This reflects the benchmark BBB credit rating that the AER adopted at that time, as well as PwC's (2013) assumption that the service provider maintains 3-year bank debt facilities.

51.   As shown in Table 3-5, we estimate a commitment fee of **45 bp**. We have retained PwC's (2013) 3-year bank debt facilities assumption but modified the benchmark credit rating to BBB+ in accordance with the AER's draft Guideline (as discussed in paragraph 25.ii). The benchmark 3-year BBB+ yield is obtained as the weighted average of the Bloomberg 3-year BBB (2/3 weight) and A yields (1/3 weight).

Table 3-5: Calculation of commitment fee for 20 days from 30 November 2018 to 31 December 2018

	Fees per annum (% annualised)
Bloomberg 3 year BBB yield	3.23
Bloomberg 3 year A yield	2.79
Bloomberg 3 year BBB+ yield (weighted average of BBB and A)	3.08
AUD 3 year swap rate	2.19
Bloomberg 3 year implied margin (proxy for bank debt margin)	0.90
Commitment fee (50 per cent of margin)	**0.45**

3.2.1.2   *Quantum of required liquidity reserve*

52.   PwC (2013) estimates that the quantum of required liquidity reserve is 8.8% of the benchmark service provider debt on issue.[12] Incenta (2014), on the other hand, applies a bottom-up approach that applies S&P's own formula to carry out a forward cash flow analysis based on the service provider's financial data.[13]

53.   Table 3-6 updates Incenta's (2014) bottom-up approach using JGN's proposed PTRM for the 2020-25 regulatory cycle. As noted in Paragraph 25.i, we also modify Incenta's (2014) methodology by assuming that 6-monthly debt repayments are equal to 5% of the opening RAB in each year, which more closely reflects the 10-year trailing average approach that is used to calculate the benchmark return on debt.

54.   Following S&P's formula as applied by Incenta (2014), the quantum of required liquidity reserve is determined based on 110% of the total uses ($236 million in 2020-21 × 110% = $259 million) minus the total sources ($83 million) of funds. The

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[12]   PwC, Energy Networks Association: Debt financing costs, June 2013, p. 21.

[13]   Incenta, Debt raising transaction costs: Jemena Gas Networks, June 2014.

required liquidity reserve in 2020-21 is therefore **$176.7 million**, which increases each year until it reaches **$215.2 million** in 2024-25. These represent **8.8%** and **9.5%** of regulatory debt in 2020-21 and 2024-25 respectively.

Table 3-6: Calculation of undrawn committed bank lines 6 months ahead ($million unless otherwise stated)

	2020-21	2021-22	2022-23	2023-24	2024-25
Revenue (smoothed)	228.59	231.13	233.86	235.00	237.21
Operating costs	96.67	104.97	109.76	113.14	116.53
EBITDA	131.91	126.16	124.10	121.86	120.68
Sources					
EBITDA	131.91	126.16	124.10	121.86	120.68
Less, Cash taxes	4.09	5.16	6.07	7.70	6.17
Less, Interest paid	45.10	46.73	48.29	49.80	50.97
Funds From Operations	82.72	74.27	69.75	64.36	63.54
Plus, Proceeds of asset sales	0.11	0.07	0.06	0.05	0.07
Total sources (not incl. committed but unused bank lines)	**82.83**	**74.33**	**69.80**	**64.41**	**63.61**
Total sources (not incl. committed but unused bank lines) EBITDA falls 15%	**63.04**	**55.41**	**51.19**	**46.13**	**45.51**
Uses					
Expected capital spending	94.42	97.33	102.06	96.13	93.57
Plus, Debt repayments	100.27	103.89	107.34	110.70	113.30
Plus, Dividend payments	41.21	42.70	44.11	45.50	46.56
Total uses:	235.90	243.92	253.52	252.33	253.44
Committed undrawn bank lines for A/B = 1.1x	**176.66**	**193.97**	**209.07**	**213.15**	**215.17**
Undrawn bank lines as % of debt	8.8%	9.3%	9.7%	9.6%	9.5%
Undrawn committed bank lines for A-B = 0 when EBITDA falls 15%	172.86	188.51	202.33	206.19	207.93
Undrawn committed bank lines as % of regulatory debt	8.6%	9.1%	9.4%	9.3%	9.2%

3.2.1.3   Commitment fees for required liquidity reserve

55.   Multiplying per-unit commitment fees of 0.45 bppa from Table 3-5 with the required liquidity reserves computed in Table 3-6 ($176.7 million to $215.2 million) results in commitment fees of $0.79 million to $0.96 million as shown in Table 3-7. These translate to 3.95 bppa relative to regulatory debt in 2020-21 and 4.26 bppa in 2024-25. Over the 2020-25 regulatory cycle, the levelised cost of commitment fees relative to regulatory debt is **4.22 bppa** on average.

Table 3-7: Benchmark bank facility commitment fees

	2020-21	2021-22	2022-23	2023-24	2024-25
Debt (60% of RAB) ($m)	2,005.42	2,077.90	2,146.87	2,214.09	2,266.03
Bank facility required ($m)	176.66	193.97	209.07	213.15	215.17
Commitment fee ($m)	0.79	0.87	0.94	0.96	0.96
Commitment fee (bppa on regulatory debt)	**3.95**	**4.19**	**4.37**	**4.32**	**4.26**
Levelised cost (bppa)	**4.22**				

3.2.2   Direct transaction costs

56. We use PwC's (2013) estimates of establishment fees and other costs for the purpose of estimating the direct transaction costs associated with maintaining a liquid reserve. The establishment fee is assumed to be 17 bp of the liquid reserve, while all other fees are assumed to be identical to PwC's (2013) estimates.[14]

57. Both PwC (2013) and Incenta (2014) use a 10% discount rate to obtain a bppa estimate of the costs. As mentioned in paragraph 25.iii, we instead use JGN's proposed 5.16% vanilla WACC when discounting to annual amounts.

58. Table 3-8 shows that the fees for establishing a bank debt facility with sufficient liquid reserve in 2020-21 is $141,372 or **0.70 bppa** relative to regulatory debt. Table 3-9 shows the equivalent calculations for the 2020-25 regulatory cycle, with the liquid reserve ranging from **0.70 bppa** in 2020-21 to **0.69 bppa** in 2024-25, such that the levelised cost over the cycle is **0.71 bppa**.

Table 3-8: Fees for establishing a committed but unused bank debt facility for a debt portfolio of $2.005 billion (2020-21)

	Basis	Cost	Annual	Bppa
Establishment fee*	Up-front	300,328.59	69,685	0.35
Other bank transaction costs:				
-legal counsel – borrower	Up-front	86,667	20,109	0.10
-legal counsel – bank	Up-front	90,000	20,882	0.10
-Syndication fee	Per annum	30,000	30,000	0.15
-Bank's out-of-pockets	Up-front	3,000	696	0.00
Total Annual Equivalent			141,372.24	0.70

Calculated as 0.17% × quantum of bank debt, discounted to an annual rate using 5.16% vanilla WACC; All costs other than non-establishment fees calculated using PwC (2013) approach annualised using 5.16% vanilla WACC.

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[14]   PwC, Energy Networks Association: Debt financing costs, June 20, p. 22.

Table 3-9: Fees for establishing a committed but unused bank debt facility over the 2020-25 period

	2020-21	2021-22	2022-23	2023-24	2024-25
Establishment fee	69,685	76,513	82,467	84,075	84,874
Other bank transaction costs	71,688	71,688	71,688	71,688	71,688
Total annual equivalent costs	141,372	148,200	154,154	155,763	156,562
Total annual equivalent cost (bppa)	**0.70**	**0.71**	**0.72**	**0.70**	**0.69**
Levelised cost (bppa) on regulatory debt	**0.71**				

3.2.3 Total cost of maintaining a liquid reserve

59. Table 3-10 sums the commitment fees derived in Table 3-7 with other direct transaction costs calculated in Table 3-9. The total cost of maintaining a liquid reserve ranges from $0.93 million in 2020-21 to $1.12 million in 2024-25. These estimates translate to **4.66 bppa** in 2020-21 and **4.95 bppa** in 2024-25 relative to the regulatory debt in each year. The levelised cost over the regulatory cycle is **4.92 bppa**.

Table 3-10: Fees for establishing and maintaining a committed but unused bank debt facility for maintaining a liquidity reserve

	2020-21	2021-22	2022-23	2023-24	2024-25
Commitment fee ($m)	0.79	0.87	0.94	0.96	0.96
Establishment fee and other costs ($m)	0.14	0.15	0.15	0.16	0.16
Total annual equivalent costs ($m)	0.93	1.02	1.09	1.11	1.12
Total annual equivalent cost (bppa)	**4.66**	**4.90**	**5.08**	**5.02**	**4.95**
Levelised cost (bppa) on regulatory debt	**4.92**				

3.3 Indirect cost: Financing 3 months ahead

60. The cost of financing 3 months ahead can be estimated by taking the difference between the 3-month interest rate on a new bond and the 3-month BBSW. PwC (2013) and Incenta (2014) obtain 3-month rates by taking the corresponding annual rates and then dividing by 4. We follow their approach in our calculations.

61. As noted in paragraph 25.iv, PwC (2013) and Incenta (2014) use the 3-month BBB interest income as a proxy for the income that offsets the interest cost on a new bond. We instead use the 3-month BBSW in this report since we consider that service

providers are more likely to invest the proceeds of the new bond into BBSW swaps instead of using it to invest in other companies.

62. We use JGN's proposed nominal pre-tax cost of debt (4.50%) as the interest rate on a 3-month bond. The annualised 3-month BBSW over 20 trading days from 30 November 2018 to 31 December 2018 is 2.03%. The annual difference between the interest cost and interest income is therefore 2.47% or 0.62% for a 3-month period. As shown in Table 3-11, this translates to a net cost of $1.54 million when re-financing a $250 million bond.

Table 3-11: Bond re-financing cost for $250 million bond (20 days from 30 November 2018 to 31 December 2018)

	Upfront cash cost for $250m	Cost for $2.651b debt portfolio
3 month interest cost on new bond ($ million)	2.81	
3 month BBSW interest income* ($ million)	(1.27)	
Total cost if invested in BBB+ credit risk and no redemption/buy back ($ million)	**1.54**	**7.70**

BBB+ income obtained as a weighted average of the 3-year BBB and A cost of debt estimates

63. Table 3-12 shows the maturing component of JGN's debt portfolio, as well as the cost of using a 3-year bond to refinance said maturing component. As mentioned in paragraph 25.v, we estimate the maturing component as 10% of the debt component of the opening RAB in each year, in accordance with the 10-year trailing average approach that the AER uses to estimate the return on debt. This results in the total cost of 3 month ahead refinancing being estimated at **6.17 bppa** relative to regulatory debt.

Table 3-12: Total cost of 3 month ahead re-financing

	2020-21	2021-22	2022-23	2023-24	2024-25
Maturing component of debt portfolio	200.54	207.79	214.69	221.41	226.60
Establishment fee & other costs	1.24	1.28	1.33	1.37	1.40
Total annual equivalent cost	6.17	6.17	6.17	6.17	6.17
Levelised cost (bppa) on regulatory debt	**6.17**				

3.4 Total debt-raising transaction costs

64. Table 3-13 shows our estimates of JGN's total debt-raising transaction costs, after adding all of the costs estimated from sections 3.1 to 3.3. Our estimate ranges from **$8.30 million** in 2020-21 to **$9.44 million** in 2024-25, which corresponds to **26.11 bppa** and **26.40 bppa** respectively. The levelised debt raising transaction cost over the regulatory cycle is **26.38 bppa**.

65. As noted in paragraph 43 of section 3.1.1, our estimates include an estimated **6.23 bppa** compensation paid to underwriters, which we denote as "CEG DRT incremental to AER DRT".

Table 3-13: Total debt raising transaction costs (bppa)

	2020-21	2021-22	2022-23	2023-24	2024-25
AER debt raising transaction costs (DRT, $m)	1.82	1.88	1.94	2.00	2.05
CEG DRT incremental to AER DRT ($m)	1.25	1.29	1.34	1.38	1.41
Debt raising transaction costs for debt component of RAB ($m)	**3.07**	**3.18**	**3.28**	**3.38**	**3.46**
Liquidity - commitment fee ($m)	0.93	1.02	1.09	1.11	1.12
3 month ahead financing costs ($m)	1.24	1.28	1.33	1.37	1.40
Total debt raising transaction costs ($m)	**8.30**	**8.65**	**8.98**	**9.25**	**9.44**
AER debt raising transaction costs (bppa)	9.05	9.05	9.05	9.05	9.04
CEG DRT incremental to AER DRT (bppa)	6.23	6.23	6.23	6.23	6.23
Debt raising transaction costs for debt component of RAB (bppa)	**15.28**	**15.28**	**15.28**	**15.28**	**15.27**
Liquidity - commitment fee (bppa)	4.66	4.90	5.08	5.02	4.95
3 month ahead financing costs (bppa)	6.17	6.17	6.17	6.17	6.17
Total debt raising transaction costs (bppa)	**26.11**	**26.36**	**26.54**	**26.48**	**26.40**
Levelised debt raising transaction costs for debt component of the RAB (bppa)	**15.28**				
Levelised debt raising transaction costs (bppa)	**26.38**				

3.5 PTRM timing benefits and debt management costs

66. The AER has rejected providing an additional amount in the debt raising allowance on the grounds that the timing benefits in the PTRM are sufficiently large to fully compensate for these costs.

67. The AER contends in its draft decision for Transgrid and more recently in the recent Draft rate of return guideline explanatory statement, that the timing benefits are in excess of 1.8% of total revenue. The AER reached this conclusion based on a report

by ACG in 2002 that estimated the value of timing benefits to be around 1.8% for Epic Energy. However, the AER notes that since that time the PTRM has been adjusted to apply a half year WACC to capex when it enters the RAB. The AER correctly notes that the effect of this is to raise the level of timing benefits:[15]

> *In 2007, we identified that the PTRM has been modified since the 2002 ACG report to recognise capex in the middle of each year, while still assuming revenues are received on the last day of the year. In practice, this modification means that we add an additional half year of WACC to all capex in the year that it enters the capital base, in order to adjust for the time value of money. Service providers recover this incremental addition through increased depreciation and by increased return on capital while the capex is being depreciated. While strictly related to capex timing, this change further benefits the service provider and heightens the favourable cash-flow timing assumptions in the PTRM. This means that the level of the favourable 'bias' in the PTRM is in our view now greater than what was estimated by ACG in 2002. For these reasons we consider there is no need for an additional explicit allowance for liquidity costs, as service providers are already implicitly and sufficiently compensated for such costs.*

68. The AER has applied the ACG 1.8% of revenue figure to a recent decision for AusNet Services' electricity distribution PTRM for 2016-20. Doing so the AER states:

> *Using ACG's initial estimate of 1.8 per cent of revenue as upward bias in the PTRM's timing assumptions is equivalent to increasing the estimated return on debt by approximately 46 basis points applied to the full regulatory asset base as opposed to only a subset of the instruments. This estimate does not take account adjustments to the PTRM to add a half year of WACC to all capex, and so may materially understate the favourable upward bias from PTRM timing assumptions.*

69. The AER then uses the above line of reasoning to assert that the favourable timing allowances actually overcompensate the required working capital allowances, and has on various occasions used this claim to support its refusal to provide compensation on other regulatory costs, such as up-front fees for financing debt:[16]

> *We have in the past rejected those fees on the basis that the favourable timing allowances in the PTRM (designed to account for working capital or liquidity) swamp the magnitude of those proposed allowances.*

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[15]   AER, Draft decision– TransGrid transmission determination– Attachment 3: Rate of return, November 2014, pp. 329-330; Referenced in: AER, Rate of return Draft Guidelines: Explanatory Statement, Draft, July 2018, pp. 457-458.

[16]   AER, Rate of return Draft Guidelines: Explanatory Statement, Draft, July 2018, p. 456.

70. While it is true that ACG's 1.8% of revenue estimate does not capture the change to the PTRM treatment of capex, this effect is partially negated by the fall in JGN's WACC since ACG's 2002 report (from 7.14% real pre-tax WACC used by ACG to JGN's 2.91% real pre-tax WACC). When account is taken of the fall in JGN's WACC, the value of timing benefits can be much smaller than estimated by ACG.[17]

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[17] Under certain simplifying assumptions, the bias can be approximated by the following formula under the PTRM framework that applied at the time of ACG's report:

$$Bias_t = (Depr_t + RoC_t)\left(1 - \frac{1}{\sqrt{1 + WACC_t}}\right)$$

Under the updated PTRM that treats capex as occurring in the middle of the year, the approximate bias equation changes to:

$$Bias_t = (Depr_t + RoC_t)\left(1 - \frac{1}{\sqrt{1 + RWACC_t}}\right) + Capex \times \left(\frac{\sqrt{1 + VWACC_t}}{\sqrt{1 + RWACC_t}} - 1\right)$$

Appendix A The role of working capital in regulation

71. Many industries operate with a time lag between the expenses that they incur and the revenues that they receive. As part of its everyday operations, a business has to pay its staff and suppliers on an ongoing basis (sometimes in advance) before it can charge its customers for the provision of goods and services. Some industries also involve holding inventory ready to be delivered whenever an order arrives from a customer, or may require a business to make prepayments on certain expenses.

72. Even after the business has provided its goods and services, it is common practice in many industries for the customers to be afforded a grace period before they are required to pay.

73. It is this time lag between when expenses are incurred and when revenues are received that necessitates the holding of working capital in order to ensure that the business can continue to operate. Having sufficient working capital available ensures that the business will be able to pay off its debts when they are due, thereby remaining solvent. Maintaining a working capital balance is not costless, however, and requires the business to pay interest in return for the financing that it receives.

A.1 Regulated utilities require working capital

74. Regulated utilities face the same time lag in their cash flows that requires them to hold working capital, which in turn incurs the costs associated with attaining such financing. Australian regulators generally accept the premise that the cost of maintaining working capital is one that businesses should be compensated for, although each regulator has its own method for providing such compensation.

75. For example, in its recent policy paper reviewing its working capital allowance framework, NSW IPART stated:[18]

> *We include this allowance in the NRR to ensure businesses can recover the costs they incur due to delays between them delivering regulated goods or services and receiving payment for those goods or services (net of any benefits they receive due to delays between them receiving goods or services and paying for those good or services). It typically represents around 1% of their NRR.*

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[18] IPART, Working Capital Allowance, Policy Paper, Final Report, November 2018, p. 1.

All regulators recognise that working capital is a legitimate business expense and should be recovered in regulated prices. However, not all include an explicit allowance for the expense, as we do.

76. Furthermore, the AER's draft Guideline refers to a 2002 report by ACG, and acknowledges that service providers require working capital to remain liquid:[19]

In 2002, Allen Consulting Group (ACG) provided the ACCC with a report on working capital. Working capital is one measure of a service provider's liquidity. It is calculated as current assets minus current liabilities. 'Current' refers to assets/liabilities that will be realised/settled within 12 months. Strictly, TransGrid's proposed allowance is designed to meet S&P Global's definition of liquidity as opposed to working capital. However, while S&P Global's definition of liquidity includes some additional items to that of the strict definition of working capital, the overall concept is the same—that is, that there be enough cashflow and liquid assets to meet short term liabilities over a 12 month period.

A.2   Calculating allowances for the return on working capital

77. Australian regulators have mostly used one of two approaches when providing compensation for working capital requirements:

   a.   Implicitly allowing for return on working capital through favourable timing assumptions (AER, ESC); or

   b.   Calculating an explicit allowance for the return on working capital (IPART, ERA, QCA).

A.2.1   Implicit allowance for return on working capital

78. As IPART explains, approach 77.a operates by treating depreciation as occurring at the end of the year, and treating return on capital as occurring in the middle of the year:[20]

Some regulators do not provide an explicit working capital allowance because they use a year-end value of the return of assets (ie, depreciation) and a proxy for the mid-year value of the return on assets[a] in the NRR. This approach tends to create a 'bias' in favour of businesses that receive payments throughout the year, providing these businesses with extra

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19   AER, Rate of return Draft Guidelines: Explanatory Statement, Draft, July 2018, p. 457.

20   IPART, Working Capital Allowance, Policy Paper, Final Report, November 2018, p. 2.

income they can use to fund their working capital requirements. Thus, it provides an implicit working capital allowance.[b] Regulators that use this approach include the AER, ESC, OFGEM and OFWAT.

a For example, ESC, OFWAT and OFGEM provide a return on the average of the opening and closing value of the RAB (ie, they apply the WACC to the mid-year value of the RAB).

b See The Allen Consulting Group, Working Capital Relevance for the Assessment of Reference Tariffs. Report to the ACCC, March 2002

79. Consistent with the above explanation, the AER's Draft Guideline does not provide an explicit allowance for return on working capital, and instead relies on "favourable timing allowances" in the PTRM as implicit compensation for the costs associated with maintaining working capital.

80. These favourable timing allowances occur because the PTRM calculates service provider revenues as though they were all collected as one lump sum at the end of each year. Standard business practice, however, involves collecting revenues steadily throughout the year, meaning that service providers receive additional gains from the time value of money.

81. This argument can be seen in the Draft Guideline, in which the AER referred to its 2014 draft decision for Transgrid:[21]

   In 2002, Allen Consulting Group (ACG) provided the ACCC with a report on working capital. Working capital is one measure of a service provider's liquidity. It is calculated as current assets minus current liabilities. 'Current' refers to assets/liabilities that will be realised/settled within 12 months. Strictly, TransGrid's proposed allowance is designed to meet S&P Global's definition of liquidity as opposed to working capital. However, while S&P Global's definition of liquidity includes some additional items to that of the strict definition of working capital, the overall concept is the same—that is, that there be enough cashflow and liquid assets to meet short term liabilities over a 12 month period.

   The report concluded that, because the PTRM assumes service providers receive revenue on the last day of the year, target revenue would offset any shortfall in the cost of financing operating expenditure (the required return on working capital)...

82. The AER Draft Guideline draws on a 2002 report by Allen Consulting Group (ACG), which concluded that the favourable timing allowances in the PTRM generated a

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[21]   AER, Draft decision– TransGrid transmission determination– Attachment 3: Rate of return, November 2014, pp. 329-330; Referenced in: AER, Rate of return Draft Guidelines: Explanatory Statement, Draft, July 2018, p. 457.

favourable bias of 1.8% of total revenue when compared with the cost of maintaining working capital.

A.2.2 Explicit allowance for return on capital

83. In deciding to include an explicit allowance for return on capital, IPART pointed out that its regulatory framework differed from those of the AER, ESC, Ofgem, and Ofwat, in that those other regulators used year-end depreciation with mid-year return on capital, while IPART adopted mid-year values for both of those parameters. As such, the resulting lack of a favourable timing bias requires IPART to provide an explicit working capital allowance:[22]

   IPART differs from these regulators because we use a mid-year value of the return on and of assets in the NRR. Using a mid-year value does not create the same bias in favour of businesses that receive payments throughout the year, and so does not provide them with an implicit working capital allowance. Therefore, we must include an explicit allowance to ensure the businesses we regulate have sufficient working capital to cover their working capital requirements.

84. The West Australian ERA also decided to provide an allowance for the cost of working capital as part of its amended final decision for ATCO in 2015. This was because the working capital component had not been included as a building block, and would therefore be compensated separately:[23]

   The NGL(WA) and NGR do not make specific reference to the cost of working capital used by a service provider.

   However, rule 76 of the NGR provides that total revenue is to be determined for each regulatory year of the access arrangement period using the building block approach. The cost of working capital is not specifically included as a building block.

85. The ERA thus accepted ATCO's submission for an explicit working capital allowance to be included, although the ERA required additional information from ATCO and also made changes to ATCO's assumed parameters:[24]

   The Authority's Final Decision is to approve the inclusion of ATCO's proposed working capital cycle mode and assumptions as set out in

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[22]   IPART, Working Capital Allowance, Policy Paper, Final Report, November 2018, p. 2.

[23]   ERA, Final Decision on Proposed Revisions to the Access Arrangement for the Mid-West and South-West Gas Distribution Systems, as amended on 10 September 2015, p. 463 at [2177]-[2178].

[24]   ERA, Final Decision on Proposed Revisions to the Access Arrangement for the Mid-West and South-West Gas Distribution Systems, as amended on 10 September 2015, p. 467 at [2196].

paragraphs 2182, 2183 and 2184 to calculate the return on working capital requirement. However, as explained above, due to the various amendments required in this Final Decision, ATCO is required to amend Table 83 of the access arrangement information of the as set out in Table 110 below.

Appendix B   Explicit allowance for the return on working capital

86.   Some Australian regulators provide explicit allowances for return on working capital, although the formulae that they each use are not perfectly identical. In this section we discuss these approaches as adopted by IPART, ERA, and QCA, and use their frameworks to obtain alternative estimates of JGN's working capital allowance.

87.   Sections B.1 to B.3 set out the approach taken by each regulator, while section B.4 shows the estimates obtained using IPART's and ERA's methods. We do not estimate QCA's method due to data constraints.

88.   Table 3-14 summarises the assumptions that IPART, ERA, and QCA adopted when determining their working capital allowances.

Table 3-14: Comparison of approaches with explicit working capital allowance

	IPART	ERA	QCA
Conceptual approach	Mix of benchmarking and actual business conditions	Actual business data	Actual business conditions
Receivables	Product of annual revenue and the sum of net days billed in arrears and days delay before payment	Product of tariff revenue and receivable days estimated from general ledger	Current assets from business accounts
Payables	30 days of opex and net capex	Creditor payment days estimate from general ledger multiplied by the sum of opex and net capex	Current liabilities from business accounts
Inventory	Fixed amount from efficient business practice	Historical inventory-to-capex ratio multiplied by actual capex in each year	Inventories from business accounts
Prepayments	Fixed $ amount if justified, but zero by default	Not explicitly included	Not explicitly included
Return on working capital	Net working capital multiplied by nominal post-tax WACC divided by half-year nominal post-tax WACC	Working capital multiplied by nominal post-tax WACC	Working capital multiplied by nominal post-tax WACC

B.1   IPART's approach

89.   IPART's net working capital formula is set out in Equation 3-1.

Equation 3-1: IPART's formula for net working capital

$$Net\ working\ capital = receivables - payables + inventory + repayments$$

Where:

- $Receivables = \frac{50\% \times Net\ number\ of\ days\ billed\ in\ arrears\ +\ days\ delay\ before\ payment}{365\ days} \times annual\ revenue$

- $Payables = \frac{benchmark\ number\ of\ days\ (usually\ 30)}{365\ days} \times forecast(opex + net\ capex)$

- $Inventory = fixed\ \$\ amount\ based\ on\ efficient\ business\ practice$

- $Prepayments = fixed\ \$\ amount\ if\ business\ can\ demonstrate\ prudency\ and\ efficiency,\ otherwise\ zero\ by\ default$

90.   The net working capital estimate would then be multiplied by the service provider's *nominal* post-tax WACC and then discounted by a half-year nominal post-tax WACC in order to generate the working capital allowance.

91.   IPART's policy paper includes comprehensive reasoning behind each of the four parameters on the right hand side of Equation 3-1, which we do not rehash in this report. We draw attention, however, to three particularly pertinent issues addressed in IPART's paper.

92.   First, IPART had initially proposed to not include a component for prepayments, on the basis that information on prepayments was sparse and tended to have immaterial impact on the final allowances. However, stakeholder submissions disagreed, with a number of examples being cited as to how prepayments could be significant to service providers, and could constitute efficient business practice. IPART thus decided to accept the stakeholders' proposals and include a prepayment component that was presumed to be zero by default, but would be changed to real fixed dollar amount if the business could demonstrate that the amount was "prudent and efficient".[25]

93.   Second, IPART's use of a nominal post-tax WACC was a change from its previous approach, which applied a real post-tax WACC.[26] IPART's reasoning for this change involved drawing a distinction between the treatment of net working capital and the RAB. Specifically, real WACC is applied to the return on the RAB because inflation is later added during the RAB roll-forward. The return on working capital, on the other

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[25]   IPART, Working Capital Allowance, Policy Paper, Final Report, November 2018, pp. 15-16.

[26]   IPART, Working Capital Allowance, Policy Paper, Final Report, November 2018, p. 6.

hand, would not include a cumulative inflationary gain component, and would instead be calculated each year according to the service provider's requirements for that year. Applying nominal WACC to working capital would thus provide implicit compensation for inflationary gains that were excluded from the real financial parameters that IPART used in its calculations.

94.   Third, IPART derives the working capital allowance by multiplying the net working capital with nominal post-tax WACC and then discounting by a half-year of nominal post-tax WACC. IPART's reasoning for applying the half-year discounting is to be "consistent with our timing assumptions and treatment of return on and of the RAB".[27] No such discounting should be applied to JGN's working capital allowance since JGN's PTRM does not use the mid-year value for the return on and of assets, and instead assumes that they occur at the end of the regulatory year.

B.2   ERA's approach

95.   The West Australian ERA provided ATCO with a working capital allowance as part of its 2015 Final Decision for ATCO's gas access arrangements.

96.   ATCO's working capital requirement was calculated using the following formula:[28]

$$Working\ capital = Receivables - Payables + Inventory$$

whereby

- Receivables is defined as 18/365 days out of the previous year's tariff revenue;

- Payables is defined as 15/365 days out of the forecast expenses (sum of forecast capex and forecast opex); and

- Inventory is defined as 0.89% of capital expenditure.

97.   The working capital requirement was then multiplied by ATCO's nominal post-tax WACC of 6.02% in order to obtain the estimated working capital allowance.

98.   The definitions shown in paragraph 96 for each working capital component appear to be specific to ATCO, instead of being general principles that would apply to all the businesses regulated by ATCO. The rationale that ATCO provided for each component (ultimately accepted by the ERA) were:[29]

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[27]   IPART, Working Capital Allowance, Policy Paper, Final Report, November 2018, p. 13.

[28]   ERA, Final Decision on Proposed Revisions to the Access Arrangement for the Mid-West and South-West Gas Distribution Systems, as amended on 10 September 2015, p. 467 at Table 110.

[29]   ERA, Final Decision on Proposed Revisions to the Access Arrangement for the Mid-West and South-West Gas Distribution Systems, as amended on 10 September 2015, pp. 464-465 at [2186]-[2189].

- **Receivables**: Average monthly receivable balance on ATCO's general ledger over a 12-month period divided by total haulage revenue over the same period results in **18 days** as a receivable days estimate;

- **Payables**: Average creditor balances from ATCO's general ledger over a 12-month period divided by the sum of average capex and opex (excluding UAFG) over that period results in **15 days** as a creditor payment days estimate; and

- **Inventory**: Dividing the monthly inventory levels from ATCO's general ledger over the 2011-2013 years by actual capex in each year, and then averaging the three quotients results in **0.89%** estimated inventory level.

99. In terms of using a nominal WACC, the ERA accepted ATCO's reasoning that the working capital requirement was not indexed in the rolling forward of the asset base, and thus did not require the removal of inflationary gain associated with the use of a real WACC:[30]

> *2190. ATCO states that it did not implement the Authority's amendment in relation to working capital because "the ERA requires the removal of an 'inflationary gain' which is not relevant to working capital". ATCO states that its working capital proposal does not index the capital base going forward, and therefore it is not appropriate to adjust the working capital amount...*

> *2194. Upon further consideration of ATCO's initial proposal and revised proposal, the Authority agrees that a modelling adjustment for inflationary gain is not required for the calculation of a return on working capital.*

100. Using the above framework, the ERA determined that the return on working capital allowances would be as shown in the last row of Table 3-15, which reproduces Table 110 of the ERA's Final Decision.

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[30]   ERA, Final Decision on Proposed Revisions to the Access Arrangement for the Mid-West and South-West Gas Distribution Systems, as amended on 10 September 2015, pp. 465-466 at [2190] and [2194].

Table 3-15: Approved return on working capital for ATCO

Nominal $ million	Jul-Dec 2014	2015	2016	2017	2018	2019
Tariff Revenue	99.90	181.52	167.41	157.96	150.37	143.41
Expenses						
Forecast Capital Expenditure	31.13	69.22	70.16	71.99	74.51	76.58
Forecast Operating Expenditure	39.24	98.91	89.15	81.69	80.38	84.44
Total Expenses	70.37	168.12	159.31	153.68	154.89	161.02
Working Capital Requirement						
Receivables (18 days)	9.77	8.95	8.23	7.79	7.42	7.07
Payables (15 days)	-5.74	-6.91	-6.53	-6.32	-6.37	-6.62
Inventory (0.89% of capital expenditure) [sic]	0.35	0.88	0.79	0.73	0.72	0.75
Working Capital Requirement	4.39	2.92	2.50	2.20	1.77	1.21
Return on Working Capital at WACC	**0.13**	**0.18**	**0.15**	**0.13**	**0.11**	**0.07**

B.3   QCA's approach

101.   In its 2012 final report for SunWater, the QCA concluded that SunWater should receive a working capital allowance based on 0.9% of forecast revenues multiplied by the approved regulatory WACC.

102.   The QCA's 0.9% estimate was obtained using the following formula:[31]

$$Total\ working\ capital = current\ assets - current\ liabilities$$
$$= average\ trade\ debtors\ (net\ provision\ of\ bad\ debts)$$
$$+ inventory - trade\ creditors$$

where:

- Current assets = Receivables + GST receivables + Accrued revenue;
  - Receivables = Trade debtors + Term trade debtors − Provision for impairment
- Current liabilities = Payables + Employee benefits + Other current liabilities;
  - Payables = Trade creditors + Other creditors & accruals.

103.   The detailed calculations used by the QCA to derive its 0.9% estimate are shown in Table 3-16, which reproduces Table 6.50 of the QCA's final decision (the QCA adopted

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[31]   QCA, SunWater Irrigation Price Review: 2012-17, Volume 1, Final Report, May 2012, p. 327.

Deloitte's analysis). Although the QCA accepted the use of historical data to determine working capital requirements, it recommended:[32]

SunWater explore the feasibility of basing future (subsequent regulatory period) working capital requirements on efficient forecasts of revenue and cash flows from SunWater's irrigation schemes, rather than relying on historical, whole of business data.

Table 3-16: Working capital requirements for SunWater 2007-10 (nominal $'000)

	Deloitte Analysis			SunWater Analysis		
	2007-08	2008-09	2009-10	2007-08	2008-09	2009-10
Receivables	11,294	8,646	8,076	11,294	8,646	8,076
Other current assets	15,920	17,035	14,327	0	0	0
Current Assets	27,214	25,681	22,403	11,294	8,646	8,076
Payables	18,545	22,390	20,932	4,495	7,365	4,118
Employee benefits	4,980	4,888	4,239	0	0	0
Other current liabilities	640	0	0	0	0	0
Current Liabilities	24,165	27,278	25,171	4,495	7,365	4,118
Inventories	2,444	2,639	2,572	2,444	2,639	2,572
Working Capital	5,493	1,042	-196	9,243	3,920	6,530
Average Working Capital		3,268	423		6,582	5,225
Revenue from continuing operations		198,568	196,442		198,568	196,442
% of revenue		1.6%	0.2%		3.3%	2.7%

B.4 Estimates of working capital allowance

B.4.1 IPART working capital allowance

104. Table 3-17 sets out our assumptions for calculating JGN's working capital allowance under IPART's approach. We note that some of the PTRM assumptions set out in

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[32] QCA, SunWater Irrigation Price Review: 2012-17, Volume 1, Final Report, May 2012, p. 330.

Table 3-17 differ from the ones we used for the ACG approach. This difference arises because IPART uses real parameters instead of the nominal parameters for ACG (applies to the differing estimates of target revenue, opex and capex).

105. The assumptions highlighted green in rows (a), (b), and (i) were derived from data provided by JGN.

Table 3-17: Assumptions for calculating JGN's working capital allowance under IPART's approach in 2020-21

Row		Assumptions ($m unless stated)
	Assumptions for receivables	
(a)	Billing cycle number of days* #	30 days
(b)	Allowed 'days of delay'^ #	45 days
(c)	Number of days fixed charges billed in advance	0
(d)	Forecast revenue from charges (real)	446.35
(e)	Share of fixed charges in total revenue	100%
	Assumptions for payables	
(f)	Operating expenditure (real)	188.77
(g)	Net capital expenditure (real)	184.37
(h)	Days of opex + net capex	30 days (fixed by IPART)
	Other working capital items	
(i)	Allowed inventory (real) #	19.3
(j)	Allowed prepayments	0
(k)	**Nominal post-tax WACC**	4.76%

Source: JGN PTRM, JGN data, CEG analysis; *Days between energy bills being sent out; ^Days between energy bills being sent out and receipt of payment; #Estimates obtained from JGN

106. Table 3-18 shows the resulting working capital allowance ($2.88 million with half-year discounting and $2.95 million without half-year discounting) using the above assumptions, which represents **0.08%** and **0.09%** of the opening RAB respectively.

Table 3-18: Working capital allowance using IPART's approach in 2020-21

Row		Formula	Estimates ($m)
	Net working capital		
(s)	Net number of days billed in arrears	$[(a) - 2 \times (c)] \times (e) + (a) \times [1 - (e)]$	30 days
(t)	Total receivables	$[(s)/2 + (b)] / 365 \times (d)$	73.37
(u)	Payables	$(h) / 365 \times [(f) + (g)]$	30.67
(v)	Inventory	(i)	19.3
(w)	Prepayments	(j)	0
(x)	Net working capital	$(t) - (u) + (v) + (w)$	62.00
	Working capital allowance		
(y)	Nominal post-tax WACC	(k)	4.76%
(z)	Return on working capital	$[(x) \times (y)] / [1 + (y)]^{0.5}$	2.88
	Return on working capital without half-year WACC discounting	$(x) \times (y)$	2.95
	Nominal opening RAB		**3,423**
	Working capital as % of opening RAB		**0.08%**
	Working capital without half-year WACC discount as % of opening RAB		**0.09%**

Source: JGN PTRM, JGN data, CEG analysis

B.4.2   ERA working capital allowance

107.   Table 3-19 shows our calculation of JGN's working capital allowance for 2020-21 using the ERA's approach.

108.   Our estimates of the number of days of receivables (60 days) and payables (15 days) are obtained as follows:

- **Receivables**: Half of the average 30 days' frequency of revenue invoicing and invoicing plus another 45 days until the payment is received; and

- **Payables**: Same assumption that ERA used for ATCO.

109.   Under these assumptions, the estimated working capital allowance using the ERA's approach is $3.68 million, which is 0.11% of opening RAB.

Table 3-19: Working capital allowance using ERA's approach in 2020-21

Row		Formula	Estimates ($m)
(a)	Tariff Revenue (real)		446.35
	Expenses (real)		
(b)	Forecast Capital Expenditure		184.37
(c)	Forecast Operating Expenditure		188.77
(d)	Total Expenses	(b) + (c)	373.14
	Working Capital Requirement		
(e)	Receivables (60 days)	56/365 × (a)	73.37
(f)	Payables (15 days)	-15/365 × (d)	-15.33
(g)	Inventory*		19
(h)	Working Capital Requirement	(e) + (f) + (g)	77.34
(i)	**Nominal post-tax WACC**		**4.76%**
(i)	**Return on Working Capital at WACC**	(h) × (i)	**3.68**
(j)	**Nominal opening RAB**		**3423.41**
(k)	**% of opening RAB**		**0.11%**

*Source: JGN PTRM, JGN data, CEG analysis; *ERA's decision for ATCO applied an inventory estimate that was 0.89% of capex. We replace this with JGN's $19.3 million inventory estimate.*

110. We note that if the number of days of payables is assumed to be 30 days as with the IPART approach, then the working capital allowance is $2.95 million, which is identical to IPART's estimate without the half-year WACC discounting.