Attachment 10.27

Response to Draft Decision: Curve Testing and Selecting Averaging Periods

A report by CEG

2016/17 to 2020/21 Access Arrangement Information
Response to Draft Decision

Australian Gas Networks

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COMPETITION ECONOMISTS GROUP

Curve testing and selecting averaging periods

A report for AGN

Dr. Tom Hird

January 2016

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1 Introduction

1. CEG has been engaged by AGN to prepare an expert report which provides estimates of the cost of debt under various approaches to the transition to a trailing average (and the average debt risk premium (DRP) over 2014/15 as an input to that estimate). AGN has also requested that CEG provide an assessment of the AER's November 2015 draft decision in relation to selection of different averaging periods for the DRP and base rate.

2. The remainder of this report is structured as follows:

   - **Section 2** provides our estimate of the DRP for 2014/15 and provides placeholder estimates for the cost of debt under different approaches to the transition to a trailing average. This section also provides estimates for the cost of debt under various different approaches to the transition to a trailing average;
   - **Section 3** provides our critique of the AER's views on the adoption of different averaging periods for DRP and base rates.

3. 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.

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

Thomas Nicholas Hird

2 AGN's proposed methodology for estimating DRP

5. AGN's proposal stipulates that the 9th year of AGN's trailing average DRP is to be estimated over a [redacted]

6. The nominated estimation procedure is based on the approach defined in CEG (2015),[2] whereby the spreads of a broad sample of comparator bonds are collected and compared against four DRP estimates, consisting of estimates published by Bloomberg and the RBA, each of which could be extrapolated up to 10 years in two ways using the AER and SAPN methods.

7. Out of the four DRP estimates, the one with the minimum Gaussian-kernel-weighted sum of squared errors (SSE) is deemed to be the best fit to the broad sample, and is then used as the cost of debt estimate over the averaging period.

2.1 Obtaining the broad sample of bonds

8. The broad sample of comparator bonds is selected using Bloomberg's bond search functionality based on the following criteria set out in CEG (2015):

   a. Issued by entities domiciled in Australia;

   b. Issued in Australian dollars, United States dollars, Euros or British pounds;

   c. Issued by corporations in any industry, excluding governments or government bodies; and

   d. Has a credit rating issued by Standard & Poor's of BBB-, BBB, or BBB+ on the final day of the averaging period.

9. Identifying the sample of bonds over such a long sample period is problematic because Bloomberg currently does not provide functionality for obtaining historical bond credit ratings efficiently through its Excel API. Obtaining a precise sample of bonds would require manually recording the historical credit ratings of around 6000 bonds, which is infeasible in practice. We therefore proceeded with a slight modification to criterion (d), whereby the search was carried out based on issuer credit ratings instead of the bond credit ratings.

10. We conducted a bond search on 27 October 2015, with criterion (d) expanded to search for bonds with issuer credit ratings ranging from A to BB inclusive. This

[1] AGN, 2016/17 to 2020/21 Access Arrangement Information – Attachment 10.2 (Confidential), p. 2.

[2] CEG, Critique of the AER's JGN draft decision on the cost of debt, March 2015.

resulted in a sample of 579 bonds. We then used the following procedure to obtain bond samples and corresponding DRPs in each month for the period ranging from [redacted]

- Identify the unique issuers of the consolidated bonds and manually record their historical credit ratings;
- Identify the bonds that have historical issuer credit ratings between BBB+ and BBB- as at the last trading day of each month, and use these as the bond sample for that particular month;
- Convert the daily yields of each bond into AUD fixed equivalents and calculate their average yields over the month; and
- Deduct the average interpolated swap rate from the average yield of each bond to obtain the average spreads to swap.

11. This procedure therefore implicitly assumes that issuers with credit ratings within the broad BBB band prior to 27 October 2015 had not had their credit ratings changed to be outside of the A to BB range by [redacted]

2.2 Curve testing

12. We applied curve testing to the average spreads obtained in Section 2.1 on a monthly basis from the July 2014 to June 2015 averaging period, using the minimum weighted SSE procedure set out in CEG (2015). This procedure is briefly described below:

    i. Obtain two sets of 10-year extrapolations for the Bloomberg and RBA spread to swap curves using the AER and SAPN methods;

    ii. Calculate the squared differences between the AUD fixed equivalent spreads to swap of each individual bond in the broad sample against interpolations of the four curves obtained in step (i);

    iii. Obtain the weighted sum of the squared differences from step (ii), with the weights being calculated using the Gaussian kernel with a mean tenor of 10 years and standard deviation of 1.5 years.

2.3 Results

13. The results of the goodness of fit test are shown in Table 1 for the sum of squared errors weighted according to the Gaussian kernel. These numbers have been divided

[3] For example, an issuer with a credit rating of BBB- on 31 July 2014 and BB- on 27 October 2015 would not be captured by our search. It appears to be fairly rare, however, for an issuer within the broad BBB band to undergo 3 or more increases or decreases in credit rating within the span of a single year.

by the number of bonds in the sample of that month in order to maintain comparability across the different months.[4]

14. The results in Table 1 show that the RBA curve with SAPN extrapolation provides the best fit in 8 of the 12 months, while the RBA curve with AER extrapolation has the best fit in April 2015 and May 2015. For [redacted] of the RBA-SAPN and BVAL-SAPN curves have the best fit in March 2015.

15. The last row of the table shows that the RBA-SAPN curve has the best fit when [redacted], followed by the RBA-AER curve. The BVAL-AER and BVAL-SAPN curves have the worst overall fits out of the seven estimates (four curves and three averages).

Table 1: Goodness of fit test; Gaussian Kernel weights, divided by number of bonds

	BVAL		RBA		Average			Best Fit
	AER	SAPN	AER	SAPN	AER	SAPN	Overall	
[redacted]								
Average	**21.34**	**17.20**	**14.55**	**14.07**	**17.08**	**15.11**	**15.88**	

Source: Bloomberg, RBA, CEG analysis

16. Table 2 shows the monthly average spreads for the BVAL and RBA curves using both extrapolations, as well as the corresponding spreads when the curves are averaged. The last two columns display the curves identified in Table 1 as best fits, along with the corresponding spreads. The average DRP for the best fit curves over 12 months is 1.87%.

4 This measure is conceptually similar to the standard error of regression, without any degree-of-freedom correction.

[redacted]

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Average	**1.77**	**1.55**	**1.81**	**1.89**	**1.79**	**1.72**	**1.75**		**1.87**

Source: Bloomberg, RBA, CEG analysis

2.4 Results using unweighted SSE and using both the Gaussian kernel and AUD issuing amounts as weights

17. We show the results of an alternative formulation of the weighted SSE, with the Gaussian kernel and AUD amount issued as weights; shown in Table 3 below. When both the Gaussian kernel and AUD amount issued are used as weights, the RBA curve with SAPN extrapolation is the best fit in 7 out of 12 months. RBA-AER was the best fit in 3 months, while the average of the two SAPN curves is the best fit in 2 months.

Table 3: Goodness of fit test; Gaussian Kernel and amount weights, divided by number of bonds

	BVAL		RBA		Average			Best Fit
	AER	SAPN	AER	SAPN	AER	SAPN	Overall	
[redacted]								
[redacted]								
[redacted]								
[redacted]								
[redacted]								
[redacted]								

	BVAL		RBA		Average			Best Fit
	AER	SAPN	AER	SAPN	AER	SAPN	Overall	
Average	17.70	13.96	11.55	11.11	13.78	12.03	12.71	

Source: Bloomberg, RBA, CEG analysis

18. Table 4 shows the number of months that each of the seven candidate curves is identified as the best fit under the two formulations of the goodness of fit tests. In both formulations, the RBA curve (with extrapolation of one kind or another) is most frequently the best fit, while the extrapolations of the BVAL curve are the least good fit.

Table 4: Number of months as best fit curve

Formulation						

Source: CEG analysis

19. Table 5 provides a comparison of the DRP estimates for the best fit curves identified by the two formulations of the goodness of fit tests. The formulations of the tests both happen to result in an

Table 5: Best-fit DRP estimates using different weights for SSR

	Gaussian kernel only	Kernel and issue amount
[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]
[redacted]	**1.87**	**1.87**

Source: Bloomberg, RBA, CEG analysis

2.5 Placeholder estimates of the cost of debt under transition

20. AGN's [redacted] period is not complete and therefore a placeholder must be used for this period. We have been instructed to use the month of October 2015 as the placeholder for measuring base rates and to assume that the 2015/16 DRP is the same as we have estimated above to 2014/15 (1.87%).

2.5.1 Cost of debt under various transitions

21. Table 1 below provides estimates of the cost of debt for each transition methodology in the first year of the transition, including our best estimate of the new issue premium (0.27%). The first nine averaging periods are financial years [redacted]. All estimates are based on AER extrapolation for the first 8 years. In 2014/15 we have set the cost of debt based on the curve selection described above (resulting in a DRP of 1.87%). In 2015/16 we have adopted the same DRP as a placeholder and have used October 2015 swap rates as the base rates in the hybrid transition and the [redacted] the immediate transition.

22. In addition, the hybrid and the optimal hedging transition are based (initially) on 11.5bp swap transaction costs on that portion of the portfolio assumed to be covered by interest rate swaps. This is consistent with Chairmont[5] advice to the ERA and phases

5 Chairmont, ERA Hedging Costs in the Cost of Debt, May 2015.

out over the transition. This is a conservative estimate as discussed in our companion report.[6]

Table 6: Cost of debt allowance in year 1 (annualised)

	50/50 Bloomberg/RBA for 8 years. DRP of 1.87% for 2014/15 (based on curve selection) and 2015/16 (placeholder). New issue premium assumed to be 0.27%.	RBA only for 8 years. DRP of 1.87% for 2014/15 (based on curve selection) and 2015/16 (placeholder). New issue premium assumed to be 0.27%.
Immediate transition	7.93	7.99
Hybrid transition	5.39	5.45
Guideline transition	4.84	4.84
Optimal hedging path (1/3 hedging)	7.08	7.14

Source: Bloomberg, RBA, CEG analysis.

23. Note that CEG's previous advice was that prior to calendar year [redacted] could reasonably be estimated using the average of Bloomberg and RBA estimates, both extrapolated using the AER extrapolation methodology – although we noted that the RBA and Bloomberg estimates were all very similar, as were the average estimates using AER or SAPN extrapolation. This assumption is retained in the first column of numbers. However, we include an option of RBA only for all periods.

2.5.2 Inputs into the calculations

2.5.2.1 October swap values

24. The following table provides the October 2015 swap values used in our calculations of the hybrid cost of debt.

[6] CEG, Critique of the AER's approach to transition, January 2016.

Table 7: Daily swap rates over 1 to 30 October by maturity (not annualised)

	1	2	3	4	5	6	7	8	9	10
1/10/2015	2.118	2.090	2.160	2.259	2.383	2.514	2.621	2.723	2.801	2.881
2/10/2015	2.119	2.096	2.190	2.243	2.368	2.500	2.610	2.711	2.797	2.870
5/10/2015	2.097	2.057	2.125	2.230	2.355	2.476	2.634	2.700	2.820	2.895
6/10/2015	2.115	2.081	2.157	2.274	2.400	2.528	2.645	2.745	2.831	2.905
7/10/2015	2.128	2.103	2.185	2.330	2.454	2.604	2.720	2.818	2.854	2.980
8/10/2015	2.107	2.091	2.165	2.319	2.441	2.591	2.708	2.809	2.839	2.970
9/10/2015	2.130	2.119	2.214	2.330	2.465	2.594	2.716	2.826	2.916	2.993
12/10/2015	2.155	2.152	2.224	2.326	2.463	2.598	2.706	2.824	2.898	2.973
13/10/2015	2.151	2.126	2.206	2.306	2.431	2.580	2.700	2.791	2.880	2.954
14/10/2015	2.092	2.063	2.144	2.218	2.334	2.453	2.599	2.678	2.804	2.835
15/10/2015	2.084	2.060	2.140	2.268	2.396	2.525	2.629	2.732	2.830	2.889
16/10/2015	2.060	2.040	2.140	2.264	2.393	2.514	2.631	2.742	2.830	2.895
19/10/2015	2.077	2.059	2.150	2.266	2.398	2.510	2.643	2.745	2.841	2.908
20/10/2015	2.102	2.090	2.156	2.303	2.434	2.539	2.686	2.815	2.835	2.976
21/10/2015	2.128	2.111	2.185	2.273	2.400	2.551	2.670	2.745	2.858	2.893
22/10/2015	2.110	2.087	2.169	2.242	2.374	2.529	2.648	2.751	2.811	2.893
23/10/2015	2.099	2.075	2.155	2.283	2.410	2.545	2.668	2.776	2.864	2.941
26/10/2015	2.113	2.099	2.179	2.278	2.401	2.533	2.651	2.758	2.858	2.920
27/10/2015	2.112	2.103	2.172	2.266	2.388	2.520	2.636	2.739	2.825	2.896
28/10/2015	2.045	2.038	2.095	2.223	2.340	2.486	2.603	2.706	2.755	2.865
29/10/2015	2.074	2.058	2.123	2.241	2.371	2.493	2.611	2.716	2.811	2.885
30/10/2015	2.071	2.067	2.130	2.233	2.363	2.494	2.630	2.733	2.818	2.895

Source: Bloomberg

2.5.3 Historical swap and DRP values

25. The following table provides the historical DRP and swap rates values used in our calculations.

Table 8: Historical DRPs and 10 year swap rates (neither annualised)

Financial year (unless otherwise stated)	10 year swap rates	RBA (AER extrapolation)[7]	Bloomberg (AER extrapolation)	Curve selection and placeholder
2006/07	6.313	0.779	0.613	
2007/08	7.037	1.897	1.416	
2008/09	5.612	5.432	3.357	
2009/10	6.054	2.504	3.116	
2010/11	5.836	2.000	3.514	
2011/12	4.782	2.977	3.069	
2012/13	3.920	2.960	2.801	
2013/14	4.396	2.967	2.469	
2014/15	3.358			1.871*
1 Jul 2015 – 31 Oct 2015	3.068**			1.871**

*Source: Bloomberg, AER, RBA, Reuters and CEG analysis. *Curve selection. **Placeholder.*

2.5.4 Description of DRP calculations

26. We note the following about the DRP calculations.

- The DRP estimates presented in Table 8 above are not the same as the corresponding estimates in Table 18 of our previous report for JGN.[8] This reflects revisions to the RBA historical series since the time we published that report. The values in Table 8 above are on average lower
- That historical revision by the RBA also led them to not publish a 10 year target tenor for 11 months (in addition to other changes).[9] In those months we must extrapolate from a published tenor of 7 years using SAPN extrapolation.[10]
- Historically we have used the Bloomberg BVAL curve from May 2014 and the Bloomberg BFV curve prior to that. This reflects the reasoning set out in our April 2015 report.[11]

7 The RBA recently updated its methodology for estimating DRPs. As of 31 August 2015, the RBA's DRP tables have been published with estimates derived using the new methodology, with all historical figures also updated retrospectively. The RBA estimates in this table, along with the AER extrapolation of the Bloomberg curve, both use the new RBA estimates.

In contrast, the DRPs in Table 9 of our June 2015 report were estimated using the RBA's old set of estimates. See: CEG, "The hybrid method for the transition to the trailing average return on debt: Assessment and calculations for AGN", June 2015.

8 CEG, Critique of the AER's JGN draft decision on the cost of debt, April 2015, p 91 in Appendix F.

9 March May and August 2005, September 2007 to March 2008 inclusive and June 2008.

10 We consider that this is a more reliable method of extrapolating from an effective tenor of around 6.5 years to an effective tenor of 10 years in these months. The alternative is to use straight line extrapolation using the slope of the swap curve between effective tenors of around 5.5 and 6.5 years (i.e., a very small portion of the yield curve). The average difference between these approaches is 22bp – which affects the 10 year trailing average RBA number by 2.2bp.

3 Averaging period selection

27. In our previous report for AGN,[12] we argued that allowing for the potential to specify different averaging periods for the base (swap) rate and DRP would promote Rule 87(3) in that it would allow the cost of debt allowance to better match efficient costs. The logic of that advice was that specifying different averaging periods for the base rate and the DRP may reflect efficient practice in the long run (i.e., both within any transition to a trailing average and after any transition is complete). The AER has rejected allowing this flexibility within the regulatory regime (and AGN's proposed specific use of that flexibility). The AER's primary ground for rejection appears to be as follows:[13]

> *Our decision is that debt averaging periods should not be separated into DRP and base rate components. This is because we consider this approach adds further complexity and costs to the administration of regulation. We are not satisfied that AGN has identified there are benefits which outweigh the additional complexity resulting from this approach.*

28. In addition the AER names further reasons in support for its decision:

    a. The approach was not proposed by any other service provider – suggesting that it is not consistent with efficient debt management practices and CEG has not provided any evidence to substantiate its claim that it is;[14] and

    b. AGN's proposal for separate base rate and DRP averaging periods is premised on the assumption that a benchmark efficient entity would continue to enter into hedging instruments (that is, interest rate swaps) after the first year of the transition period. However, neither AGN nor CEG has explained why a benchmark efficient entity would act in this way. The approach proposed by AGN is inconsistent with the AER's view on the efficient financing practices of a benchmark efficient entity as its transitions its financing practices to the trailing averaging approach.[15]

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11 CEG, Critique of the AER's JGN draft decision on the cost of debt, April 2015, section 6.1.1 beginning on p. 65.

12 CEG, The hybrid method for the transition to the trailing average rate of return on debt: Assessment and calculations for AGN, June 2015, pp. 83–84.

13 AER, AGN Draft Decision, November 2015, p. 3-609.

14 AER, AGN Draft Decision, November 2015, p. 3-610.

15 AER, AGN Draft Decision, November 2015, p. 3-610.

c. If service providers prefer to reduce the volatility in DRP by proposing a long [redacted] averaging period for the cost of debt.[16]

d. CEG has not provided evidence to substantiate its claim that separated averaging periods are consistent with the debt management strategy used by many firms.[17]

29. Before turning to deal with each of these grounds for rejection of separate DRP/base rate averaging periods we summarise our original views and provide elucidation in the light of the AER's comments.

3.1 Summary of rationale for different averaging periods

30. Consider a debt management environment where debt issuance cannot be easily managed to short windows in each year (i.e., cannot easily be managed such that 10% of the portfolio is refinanced each year in a short window determined up to 5 years earlier). This may be due to a less than perfectly even maturity profile of the existing debt, lumpy and uncertain future capex requirements, unknown future debt market conditions etc. For example:

- a business may have no debt falling due in a particular year; or
- a business may have two debt maturity events occurring in the same year but 6 months apart; and/or
- a business may be uncertain as to when they plan to raise new long term debt – where the decision will reflect firm-specific factors (e.g., capex requirements and/or cash-flow risks faced by the firm or perceived by lenders to be faced by the firm[18]).

31. Put simply, it may not be feasible or rational to refinance 10% of all debt in a narrow window each year. Equally, it may not be feasible or rational to spread out 10% of all debt issuance evenly over a long averaging period each.[19] Therefore, if a

16 AER, AGN Draft Decision, November 2015, p. 3-611.

17 AER, AGN Draft Decision, November 2015, p. 3-610.

18 For example, a firm may prefer to delay raising long term debt (which will lock in their prevailing DRP) if they believe that the market perception of their credit worthiness is overly pessimistic at the time and that it will improve with the passage of time and resolution of some uncertainties. In this situation they may prefer to use short term debt or even equity raising (or reduced dividends) to delay locking in long term debt rates until market sentiment becomes more favourable towards them as an issuer.

19 Indeed, while it might in some circumstances be feasible and rationale to raise debt in a single narrow averaging period it will generally not be feasible to spread debt issuance evenly over a longer averaging period. To do so would require many small debt issuances and this would lose economies of scale in debt issuance and would likely not be well received in debt markets.

business's only means of hedging to the regulatory allowance is to issue 10% of debt each year in a single pre-specified averaging period a material hedging mismatch may exist.

32. However, a business can continue to use swap contracts under a trailing average regulatory allowance to alleviate such mismatches for the base rate. Specifically, a business can structure its base rate exposure, or some portion of it, to be a trailing average of 10 year swap rates with 10% of that exposure being reset every year in a narrow window (say 20 days),[20] [redacted]

33. Of course, this leaves the business's DRP exposure unhedged unless it can also issue new debt in that narrow averaging period. As noted above, it will often be infeasible or irrational to attempt to do this and the DRP mismatch will remain. In the presence of this mismatch it can be sensible for a business to propose a long averaging period for the DRP in order to reduce the volatility in the (imperfectly hedged) DRP component of the regulatory allowance,[21] and therefore reduce the potential magnitude and volatility of any mismatch in the DRP component of costs and allowance. By specifying a long averaging period for the DRP the potential for the allowance for that year to be determined based on an unusually low measurement period is reduced – reducing the potential risks to cash-flows from such an event.

3.2 Critique of the AER's rationale for rejection

34. We do not consider that the AER's rationale for rejecting the above logic is correct.

35. First, what appears to be the AER's primary ground - the argument that the proposal for separate averaging periods a*dds further complexity and costs to the administration of regulation* - is not correct. Relative to adopting a long term averaging period for the cost of debt (something which the AER Guidelines allow), AGN's proposal simply requires the collection of 10 year swap rates in both averaging periods. The collection of the required swap rates is a trivial task as is the mathematical operations (subtraction of one average swap rate and addition of

[20] A business could conceivably spread its swap contract exposure over a longer period – say 12 months. However, this would result in daily (or, at least, weekly) small volume activity in swap markets and would have high transaction costs.

[21] Note that, although the DRP is imperfectly hedged, it is still a very significant improvement relative to the 'on the day' regime because the DRP allowance is materially more stable because it is based on a trailing average DRP and each year's update of the trailing average is based on a long averaging period. This improves the value of using swap contracts to hedge the base rate precisely because the stability in the DRP component of the allowance means that the inverse relationship between the prevailing swap rates and prevailing DRP are muted – because the two values are not measured over the same period.

another).[22] Under no reasonable basis can this be described as involving anything other than trivial further complexity and costs of administration. In relation to the AER's other grounds we respond in the same order as we have listed the grounds at paragraph 28 above:

a. The fact that no other service provider has proposed the approach is not determinative of whether it is consistent with the Rules; and

b. We had explained why a benchmark efficient entity may continue to enter into hedging instruments (that is, interest rate swaps) after the first year of the transition period and we have repeated that logic above.

c. The logic of the proposal is not to reduce volatility in DRP allowance *per se*. The logic of the proposal is to reduce the magnitude and volatility of the mismatch between the total cost of debt allowance and actual costs. This can be done by creating a more or less perfect trailing average base rate exposure and creating as stable as possible an allowance for the DRP component above that – where that DRP component is the hardest to hedge. This is because swap contracts are more flexible and liquid and can be used to manage base rates of interest to short windows each year while actual debt contracts are more difficult to manage in this way.

d. The AER has not clearly described what evidence it is imagining would demonstrate separated averaging periods are consistent with the debt management strategy used by many firms. We have explained above that separated averaging periods can reflect an efficient debt management strategy if a firm is unable to spread 10% of debt issues out evenly over their nominated averaging period each year. We have provided reasons for why this could be expected to be the case. There is currently no evidence on actual practice in this regard (either for our or the AER's contention) because annual updates for the cost of debt allowance are not in place – so we cannot observe whether businesses can time their debt issues to a narrow annual averaging period.

[22] The 10 year swap rates in the long averaging period are used to subtract from the average cost of debt in the long window to arrive at a DRP in the long window. This DRP is then added to the 10 year swap rates in the shorter window to arrive at a cost of debt allowance.

Appendix A Scope of work

36. The scope of the work we have been asked to provide is set out below.

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4 January 2016

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Dear Sir

Australian Gas Networks Limited – South Australian Access Arrangement review

We act for Australian Gas Networks Limited (**AGN**) in relation to the Australian Energy Regulator's (**AER**) review of the Access Arrangement for AGN's South Australian gas distribution network under the National Gas Law and National Gas Rules for the period July 2016 to June 2021.

You have previously prepared an expert report for AGN in June 2015 entitled *The hybrid method for the transition to the trailing average rate of return on debt* (**AGN Report**) in relation to the return on debt in connection with AGN's access arrangement revision proposal.

AGN now wishes to engage you to prepare a further expert report, in particular in relation to updated estimates for AGN's return on debt and the averaging periods used to calculate AGN's return on debt.

This letter sets out the matters which AGN wishes you to address in your report and the requirements with which the report must comply.

Terms of Reference

Legal Framework

The terms and conditions upon which AGN provides access to its gas network are subject to five yearly reviews by the AER. The AER undertakes that review by considering the terms and conditions proposed against criteria set out in the National Gas Law and National Gas Rules.

Rule 76 of the National Gas Rules provides that the total revenue for each regulatory year is determined using a building block approach, which building blocks include a return on the projected capital base.

Rule 87 provides for the determination of a rate of return on the projected capital base. The amended Rule 87 now in force requires a rate of return to be determined on a *nominal* vanilla basis (Rule 87(4)). Rule 87 now also requires that the allowed rate of return be determined such that it achieves the "*allowed rate of return objective*" (Rule 87(2)), being:

> "*…that the rate of return for a service provider is to be commensurate with the efficient financing costs of a benchmark efficient entity with a similar degree of risk as that which applies to the service provider in respect of the provision of reference services…*" (Rule 87(3)).

Rule 87(5) requires that, in determining the allowed rate of return, regard must be had to "*inter alia, relevant estimation methods, financial models, market data and other evidence*".

The return on debt is to be estimated such that it contributes to the allowed rate of return objective. The return on debt may be estimated such that it is the same for each regulatory year of the access arrangement period, or such that it differs from year to year (Rule 87(9)).

Rules 87(10) and (11) set out other important considerations for the estimating the return on debt.

Rule 74(2) requires a forecast or estimate to be arrived at on a reasonable basis and that it represent the best forecast or estimate possible in the circumstances.

Also relevant is the overarching requirement that the AER must, in performing or exercising its economic regulatory function or power, perform or exercise that function or power in a manner that will, or is likely to, contribute to the achievement of the national gas objective (**NGO**).

The NGO is to promote efficient investment in, and efficient operation and use of, natural gas services for the long term interests of consumers of natural gas with respect to price, quality, safety, reliability and security of supply of natural gas.

You should also have regard to the Revenue and Pricing Principles (**RPP**) in section 24 of the National Gas Law.

In preparing your report you should consider the relevant sections of the National Gas Rules and Law and the AER's Rate of Return Guideline (dated 17 December 2013).

Draft Decision

AGN submitted its access arrangement revision proposal to the AER on 1 July 2015. The AER published its Draft Decision in relation to the proposal on 26 November 2015.

In its Draft Decision, the AER rejected AGN's proposal in relation to the return on debt, including in respect of transition from the previous on-the-day approach to a trailing average approach. It has also rejected AGN's proposal for the use of separate averaging periods in determining the base interest rate (**base rate**) and debt risk premium (**DRP**) components of the return on debt.

Opinion

In this context, AGN wishes to engage you to prepare an expert report which provides:

1 Updated estimates of the return on debt for AGN under the following approaches to calculating the return on debt (as discussed in the AGN Report and the other reports you are currently preparing on behalf of several businesses (including AGN) responding to the AER's recent decisions (including the Draft Decision) in relation to the return on debt):

(a) an "immediate transition" or "no transition" approach, under which the trailing average is implemented immediately at the commencement of the next access arrangement period;

(b) a "hybrid transition" approach, under which a 10-year transition of the base rate only is implemented (with immediate implementation of a trailing average for the DRP), assuming that 100% of the base rate is hedged; and

(c) an "optimal hedging" approach, under which a 10-year transition of 33.3% of the base rate only is implemented, with immediate implementation of a trailing average for the remainder for the base rate (and for the DRP).

In undertaking your calculations, you should adopt the following placeholder averaging periods and values:

(d) a placeholder averaging period of [redacted] for the base rate (under the "immediate transition"/"no transition" approach);

(e) a placeholder [redacted] for the base rate (under the "hybrid transition" and "optimal hedging" approaches); and

(f) the historical [redacted] (under all approaches).

2 Your comments on the Draft Decision insofar as it relates to AGN's proposal for separate averaging periods for calculating the base rate and the DRP, and the AER's rejection thereof.

Use of Report

It is intended that your report will be submitted by AGN to the AER with its response to the Draft Decision. The report may be provided by the AER to its own advisers. The report must be expressed so that it may be relied upon both by AGN and by the AER.

The AER may ask queries in respect of the report and you will be required to assist in answering these queries. The AER may choose to interview you and, if so, you will be required to participate in any such interviews.

The report will be reviewed by AGN's legal advisers and will be used by them to provide legal advice as to its respective rights and obligations under the National Gas Law and National Gas Rules.

If AGN was to challenge any decision ultimately made by the AER, that appeal will be made to the Australian Competition Tribunal and your report will be considered by the Tribunal. AGN may also seek review by a court and the report would be subject to consideration by such court. You should therefore be conscious that the report may be used in the resolution of a dispute between the AERA

and AGN. Due to this, the report will need to comply with the Federal Court requirements for expert reports, which are outlined below.

Timeframe

AGN is required to submit its response to the Draft Decision to the AER by **6 January 2016**.

Compliance with the Code of Conduct for Expert Witnesses

Attached is a copy of the Federal Court's Practice Note CM 7, entitled "*Expert Witnesses in Proceedings in the Federal Court of Australia*", which comprises the guidelines for expert witnesses in the Federal Court of Australia (**Expert Witness Guidelines**).

Please read and familiarise yourself with the Expert Witness Guidelines and comply with them at all times in the course of your engagement by AGN.

In particular, your report should contain a statement at the beginning of the report to the effect that the author of the report has read, understood and complied with the Expert Witness Guidelines.

Your report must also:

1 contain particulars of the training, study or experience by which the expert has acquired specialised knowledge;

2 identify the questions that the expert has been asked to address;

3 set out separately each of the factual findings or assumptions on which the expert's opinion is based;

4 set out each of the expert's opinions separately from the factual findings or assumptions;

5 set out the reasons for each of the expert's opinions; and

6 otherwise comply with the Expert Witness Guidelines.

The expert is also required to state that each of the expert's opinions is wholly or substantially based on the expert's specialised knowledge.

It is also a requirement that the report be signed by the expert and include a declaration that "*[the expert] has made all the inquiries that [the expert] believes are desirable and appropriate and that no matters of significance that [the expert] regards as relevant have, to [the expert's] knowledge, been withheld from the report*".

Please also attach a copy of these terms of reference to the report.

Terms of Engagement

Your contract for the provision of the report will be directly with AGN. You should forward your account for the work performed directly to AGN.

Please sign a counterpart of this letter and return it to us to confirm your acceptance of the engagement.

Yours faithfully

Johnson Winter & Slattery

Enc: **Federal Court of Australia Practice Note CM 7, "Expert Witnesses in Proceedings in the Federal Court of Australia"**

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Signed and acknowledged by Dr Tom Hird

Date ……