

Attachment 9.4

Response to Draft Decision:
Measuring Expected Inflation for the
PTRM

A report by CEG

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Response to Draft Decision

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Measuring expected inflation for the PTRM

A report for AGN

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Table of Contents

1	Executive summary	1
1.1	Current AER practice is to estimate	1
1.2	Break even inflation	1
1.3	5 year horizon	1
1.4	AER response	3
2	Introduction	7
3	Investors' inflation expectations	8
3.1	Breakeven vs AER estimated inflation	8
3.2	Best estimate of inflation expectations	9
3.3	Break-even inflation over AGN averaging period	10
3.4	Inflation swaps over the AGN averaging period	11
3.5	Conclusion	14
4	Critique of AER response to date	16
4.1	AER response to date	16
4.2	Alternative solutions (other than amending the AER's inflation forecast methodology)	20
	Appendix A Scope of work	24



List of Figures

Figure 1: Treasury indexed bonds on issue as at 18 December 2015.....	9
Figure 2: Implied (breakeven) inflation term structure from nominal and indexed CGS yields.....	10
Figure 3: Forward (breakeven) inflation implied by nominal and indexed CGS yields	11
Figure 4: Implied inflation term structure from inflation swap markets (October 2015)	12
Figure 5: Forward inflation from inflation swap markets (October 2015).....	13



List of Tables

Table 1: Weighted average of 5 and 10 year inflation; October 2015	14
Table 2: Best estimate of inflation	15

1 Executive summary

1.1 Current AER practice is to estimate

1. Current AER practice is to forecast inflation for use in the PTRM over a 10 year horizon using RBA forecasts for the first year or so and an assumed 2.5% inflation (the mid-point of the RBA's 2-3% inflation target) over all of the remainder of the 10 year horizon. Ultimately, this means that the AER's estimate is always 2.5% or very close to it.
2. We consider that the AER should amend its approach to:
 - forecast inflation based on the break-even inflation rate implied by the difference between nominal and CPI indexed government bond yields; and
 - give more weight (at least 60%) to inflation forecasts over a 5 year period rather than a 10 year period.

1.2 Break even inflation

3. We consider that breakeven inflation¹ provides the best estimate of inflation expected over any given future period. This can depart significantly from the mid-point of the RBA range.

1.3 5 year horizon

1.3.1 Compensation for inflation in the regulatory framework

4. The PTRM uses forecast inflation as an input in order to model an assumed path of the nominal RAB over the regulatory period. The higher the inflation forecast used in the PTRM the higher will be the assumed growth in the nominal value RAB and, consequently, the lower the level of compensation provided for in modelled revenues during the regulatory period.
5. The fact that higher inflation leads to lower prices may seem counterintuitive. However, this can be understood by taking into account the interaction for the RBA roll forward model (RFM). When the RAB roll forward model comes to be applied

¹ Derived using the 'Fisher equation' which states that the nominal yield (n) on an asset is equal to the real yield (r) multiplied by inflation (p). That is: $(1+n) = (1+r)*(1+p)$. Solving for p gives $p=(n-r)/(1+r)$. Using the yield on nominal government bonds as 'n' and the yield on inflation indexed bonds as 'r', the 'break even' inflation rate is given by the above formula – which is the level of inflation at which the two assets will provide the same nominal return.

at the next regulatory review, higher inflation over the regulatory period will lead to a higher RAB due to inflation indexation of the RAB.

6. The joint operation of the PTRM and the RAB RFM is such that a nominal return is delivered in two parts:
 - A real return (the nominal return less expected inflation) is delivered during the regulatory period; and
 - Compensation for inflation is delivered in the form of a higher RAB in the RFM which is based on actual inflation.
7. Consequently, for any given nominal return (on debt and/or equity) used as an input into the PTRM, higher expected inflation leads to a lower real return and lower nominal revenues over the regulatory period (regulatory period 't'). However, higher expected inflation leads to a higher expected nominal RAB at the beginning of the subsequent regulatory period (regulatory period 't+1'). In this way, the PTRM and the RAB RFM interact in a manner intended to deliver nominal compensation inclusive of the impact of inflation.

1.3.2 Horizon of inflation forecast in the PTRM

8. It is, however, important to note that the two processes will only work together to deliver an expected nominal return equal to the nominal return used as an input to the PTRM if forecast inflation in the PTRM is the best forecast of inflation that will be used in the RFM. That is, the objective for the inflation forecast must be to forecast inflation over the five year period that the RFM will cover.²

1.3.2.1 *Compensating for nominal debt costs*

9. The cost of debt input into the PTRM is an estimate of the nominal payments that a benchmark efficient entity (BEE) has entered into with lenders.³ In this context, it is clear that the objective must be to deliver nominal compensation that is sufficient to allow these payments to be met. Therefore, for the purpose of forecasting inflation used in the PTRM it is clear that this must be the best estimate of inflation over the 5 year period covered by the next application of the RFM.

1.3.2.2 *Compensating for nominal equity costs*

10. By contrast, equity contracts are not written to promise a fixed nominal return (or even a fixed real return). Arguably, the objective of the regulatory regime is to

² Given the necessity of using lagged inflation in the regulatory process – some of this inflation will be known (published by the ABS) at the time of the regulatory decision.

³ The BEE is not assumed to have entered into debt contracts with a CPI indexation clause.

deliver to investors the best estimate of the real (inflation adjusted) return that they require and to add to this compensation for actual inflation. If this is accepted the inflation forecast used in the PTRM must be one that, when combined with the nominal cost of equity input, delivers the appropriate real return – which will then be supplemented by compensation for actual inflation in the RFM.

11. In this scenario, the correct horizon over which to estimate expected inflation is the horizon used to arrive at the estimate of the nominal cost of equity. The AER's current practice is to use the prevailing 10 year Commonwealth Government Security (CGS) yield as the proxy for the free rate upon which the nominal cost of equity is built. A 10 year horizon inflation expectation is, naturally, embedded in the prevailing 10 year nominal CGS yield. It follows that the prevailing real risk free rate must be estimated by removing expected inflation over the same 10 year horizon.

1.3.2.3 Weighted average inflation forecast

12. If it is accepted that the objective of the regulatory regime (PTRM plus RFM) is to deliver compensation for a:
 - nominal cost of debt input into the PTRM; and
 - real cost of equity (which is not an input into the PTRM itself but which is derived from the nominal cost of equity and the forecast inflation).

then there is a tension between the correct horizon to use for the inflation forecast in the PTRM. The cost of debt must be deflated by a five year horizon forecast of inflation while the cost of equity requires a 10 year horizon forecast of inflation. Consequently, the appropriate inflation forecast used as an input into the PTRM is a weighted average of 5 and 10 year expected inflation with the weights reflecting the assumed proportion of debt versus equity financing (60%/40%).

1.4 AER response

13. The above arguments have been put to the AER by United Energy, SAPN and AGN. The AER has not disputed the veracity of the analysis but has rejected making any change to its approach. The rationale for doing so is that the appropriate place in which to subject our analysis to review is within the next rate of return guideline review. However, the reasoning appears to be different between electricity and gas decisions. For AGN the AER states:⁴

Going forward, the AER would consider a change to inflation forecasting if it was endorsed by stakeholders as part of a comprehensive consultation

⁴ AER, Draft decision for AGN, November 2015, p. 3-258.

process. The next rate of return guideline review may be such a suitable process for reviewing the inflation forecasting method.

14. This is similar but not the same as the conclusion reached for United Energy which appears to rely on a legal as opposed to general policy constraint.⁵

*Going forward, the AER would consider a change to inflation forecasting in accordance with the consultation **processes mandated by the NER**. The next rate of return guideline review may be a suitable process for also reviewing the inflation forecasting method. [Emphasis added]*

15. In doing so the AER appears to have relied on an argument to the effect that:
- a. the problems identified by CEG are caused by an inappropriate specification of the inflation forecast method in the PTRM - one which creates an alleged downward biased level of expected compensation in current market circumstances;
 - b. the PTRM specification of the inflation forecast method can only be amended following a formal review of the PTRM and this is not possible within the current regulatory process; and
 - c. any other solution to the problem that has the effect of correcting the PTRM inflation forecast bias (e.g., by amending the nominal cost of debt/equity inputs to the PTRM to offset the bias) is similarly not legally possible.
16. We express no opinion in relation to part b. of the above argument which appears to be based on legal reasoning (at least for electricity businesses). However, we do note that there is an underlying economic presumption embedded in part a. that is not, in our view, correct. The problems that we have identified cannot be said to reside in the PTRM inflation forecast. Rather, they result from the interaction and interdependencies between:
- The PTRM and the inflation forecast method;
 - The nominal cost of equity and debt that is used as an input into the PTRM; and
 - The RAB roll forward model.
17. Consequently, the problems that we have identified can be corrected by changes to any one (or more than one) of these three components of the regulatory regime. Consequently, even if the AER's 'hands are tied' not to correct the problem via a change to the PTRM inflation forecast, this is not a sufficient reason to do nothing.

⁵ AER, Preliminary decision for United Energy, October 2015, p. 3-258.

The AER's hands must be tied not to use any of the three means of correcting the problem. That is, it must be the case that the position expressed in c. also holds.⁶

18. Moreover, the position expressed in part c. is inconsistent with the AER's approach to compensating for debt raising costs. In that context the AER has explicitly relied on what it regards as overcompensation built into the timing assumptions of the PTRM in order to not compensate for the efficient costs associated with meeting Standard and Poor's requirements around liquidity and prefunding debt.
19. Moreover, in that context TransGrid's legal advisers explicitly put to the AER the view that it was not legally permissible to make an offsetting change to the inputs to the PTRM in order to undo overcompensation built into the structure of the PTRM.

"[t]he other reason given by the AER for not including the relevant Debt Raising Costs is that the timing assumptions in the post-tax revenue model already overcompensate TransGrid. Again, it is not clear why this is relevant to the assessment under the NER given that the claimed overcompensation from the post-tax revenue model is not considered in clause 6A.6.6 of the NER. As such, the AER cannot rely on this claimed overcompensation when determining TransGrid's allowed operating expenditure when applying clause 6A.6.6 of the NER as it is required to do"

20. In rejecting this position the AER stated:⁷

We do not accept this interpretation of the NER. Under s.16 of the NEL, we must perform our functions in a manner that will or is likely to contribute to the achievement of the NEO. In giving effect to this, we must specify the manner in which the constituent components of our decision relate to each other, and the manner in which that interrelationship has been taken into account in the making of our decision.

*Accordingly, if costs are adequately compensated in one component of our decision, we must take that into account when considering the interrelated components of our decision. **Otherwise, the overall decision may over- or under- compensate the service provider.***

We are satisfied that TransGrid's proposed 'other' debt raising costs are appropriately compensated through the timing assumptions employed in the PTRM as a constituent component of our decision. Neither TransGrid, Ashurst or Incenta appear to dispute this analysis; instead they argue it is

⁶ We note that, unlike the NER for electricity businesses, the NGR do not prescribe the use of a PTRM for gas businesses (nor has the AER published a PTRM for gas businesses or guidelines for its use). Rather, the key objectives are satisfying the ARORO and the NGO.

⁷ AER, Final decision for Transgrid, April 2015, 3-545 to 3-546.

*not relevant. We disagree. When we consider whether the total opex forecast reasonably reflects the opex criteria and the rate of return reflects the efficient financing costs of a benchmark efficient business, **we must have regard to the interrelationships between the different aspects of our decision.***

This approach is supported in the reasoning of SCER for proposing the amendments to s.16 of the NEL. These amendments require us to specify the manner in which the interrelated components of our decision have been taken into account. SCER explained that considering constituent revenue components in isolation ignores the importance of interrelationships between components. SCER observed that this would not contribute to the achievement of the NEO and, in the past, has resulted in regulatory failures. [Emphasis added.]

21. Of course, this logic was employed in the context of an aspect of the PTRM resulting in overcompensation. However, it is not obvious why it would not equally apply in the context of an aspect of the PTRM resulting in undercompensation. Therefore, the same logic would suggest that the AER “*must have regard to the interrelationships between the different aspects of*” its decision and that in doing so it is open to the AER to set the inputs to the PTRM in a manner that is likely to contribute to the achievement of the NEO and NGO.
22. We do not offer any legal view on whether Ashurst or the AER is correct in their legal interpretation. However, we do note that as a matter of economics the issues raised above are the same as the issues that are raised in relation inflation forecasting. That is, the AER’s logic above is that it is appropriate to set the inputs to the PTRM for liquidity/prefunding costs in a manner that takes into account how the PTRM is structured and, in so doing, will lead to an appropriate level of compensation. The AER says that this is appropriate because “*otherwise, the overall decision may over- or under- compensate the service provider*”.
23. The same logic would suggest that the AER should set the nominal cost of debt and equity inputs into the PTRM in a manner that takes into account how the PTRM is structured and, in so doing, will lead to an appropriate level of compensation.

2 Introduction

24. We have been asked by AGN to provide a report advising on the best estimate of the inflation expectation to be used as an input into the PTRM. The exact scope of work is set out in Appendix A. This report should be read in conjunction with our earlier reports for SAPN⁸ and United Energy⁹ covering the same issues.
25. The remainder of this report is structured as follows:
- **Section 2** provides an assessment of investors' expectations of future inflation; and
 - **Section 3** summarises how, in the light of the estimates from section 2, the inputs into the PTRM can be amended to ensure that investors can expect the appropriate level of nominal compensation for the cost of debt and equity;
 - **Section 4** assesses the AER's arguments for not making any amendments.
26. 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. I have been provided with a copy of the Federal Court of Australia's *Guidelines for Expert Witnesses in Proceedings in the Federal Court of Australia*, and confirm that this report has been prepared in accordance with those Guidelines.



Thomas Nicholas Hird

⁸ CEG, Measuring expected inflation for the PTRM, June 2015

⁹ CEG, Measuring risk free rates and expected inflation, April 2015.

3 Investors' inflation expectations

3.1 Breakeven vs AER estimated inflation

27. In our two previous reports^{10 11} on this issue we have argued that breakeven inflation is a better estimate of expected inflation than the method associated with the AER's estimate. There are two reasons for this:

- First, the AER's methodology assumes that investors expect that inflation will be in the middle of the AER target range beyond 1-2 years. While this is a reasonable assumption in most market circumstances it is not a reasonable assumption in current market circumstances¹² - where the risks of below-target inflation are heightened. By contrast, breakeven inflation takes its estimate of medium to long term inflation from traded prices in bond markets.
- Second, the reason for previously abandoning break-even inflation as the best estimate of expected inflation no longer applies. The indexed bond market has had much greater and deeper issuance creating much improved liquidity in this market.

28. In support of the second point we noted in our previous report that in a 26 May 2015 speech¹³ the CEO of the AOFM stated:

From a modest starting point in 2009 when we recommenced indexed issuance (with \$6 billion on issue spread across 3 lines), we now have around \$27 billion in stock outstanding (\$33 billion when adjusted for inflation indexation). This is spread across 7 lines with a curve extending 20 years.

29. Since then there has been a further \$2bn in net issuance with the following maturity profile –with the largest value of indexed bonds having maturities between 10 and 15 years.

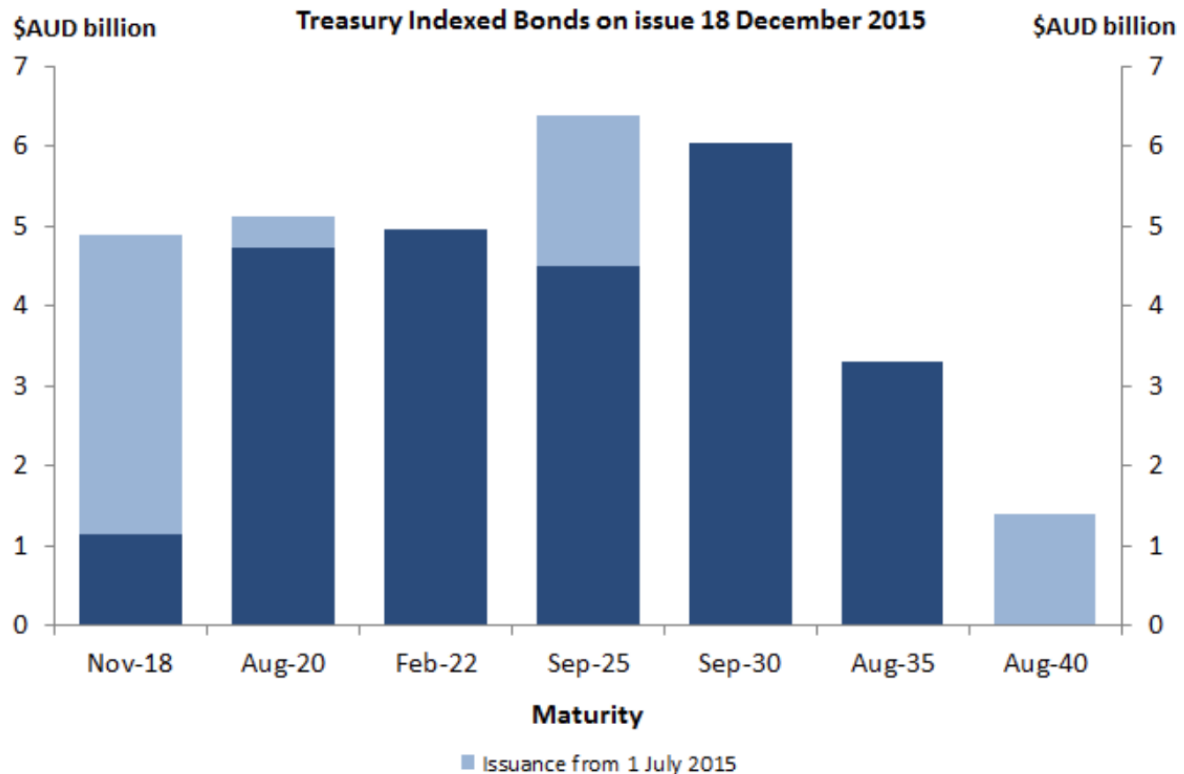
¹⁰ CEG, Measuring expected inflation for the PTRM, June 2015

¹¹ CEG, Measuring risk free rates and expected inflation, April 2015.

¹² CEG, Measuring expected inflation for the PTRM, June 2015, section 2 and 2.1 in particular.

¹³ Australian Government Sovereign Debt: Are we there yet? What more can be expected in terms of developing the market? – Presentation to the Australian Business Economists Luncheon.

Figure 1: Treasury indexed bonds on issue as at 18 December 2015



Source: AOFM website accessed on 23 December 2015

3.2 Best estimate of inflation expectations

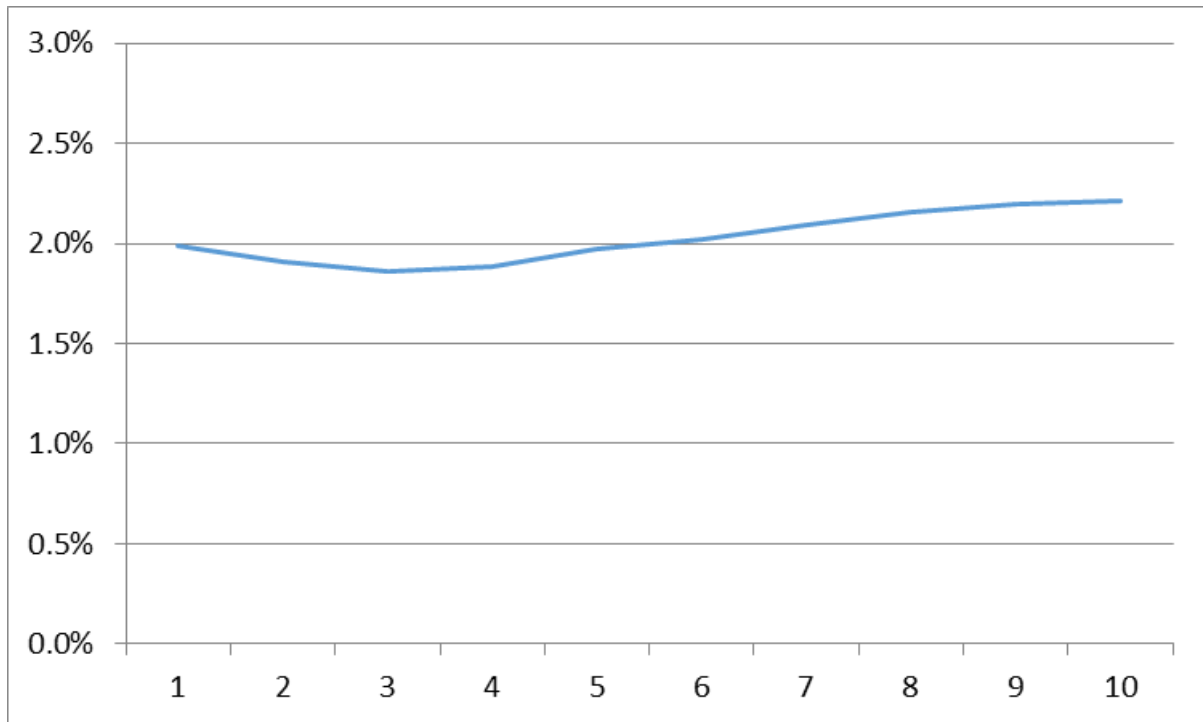
30. In AGN's placeholder averaging period (calendar month October 2015) the AER's methodology for setting expected inflation results in a 2.50% value.
31. The nominal 5 and 10 year CGS yields were 2.09% and 2.66% respectively. Consequently, if the AER's method for estimating expected inflation is accepted as accurate then the implied real return on 5/10 year nominal CGS is -0.41%/0.16%. This is below the guaranteed real yield on indexed CGS available in the bond market over the same period at 5/10 year maturity of 0.13%/0.45%. If the AER's inflation forecast was correct it would imply that investors in nominal bonds expect to receive a negative real yield over the next 5 years – notwithstanding that they could invest in an indexed CGS that will deliver a guaranteed positive real yield.
32. Put another way, if the AER were to use its current methodology then its cost of capital allowance would be based on the implicit assumption that investors require not only a negative real return on the "risk free" asset, but a substantially lower real return than is available from the purchase of inflation indexed CGS.

33. By contrast, expected 5/10 year inflation over the AGN placeholder averaging period, as measured by break even inflation was 1.97%/2.21%. This implies a positive real yield on 5/10 year nominal CGS of around 12bp/45bp.

3.3 Break-even inflation over AGN averaging period

34. Break even forecasts of inflation are currently much lower than 2.5% at both the 5 and 10 year term. Over October 2015 the implied term structure of average annual inflation from CGS yields is shown in Figure 2. This figure shows that average annual breakeven inflation over 10 years was 2.21%.

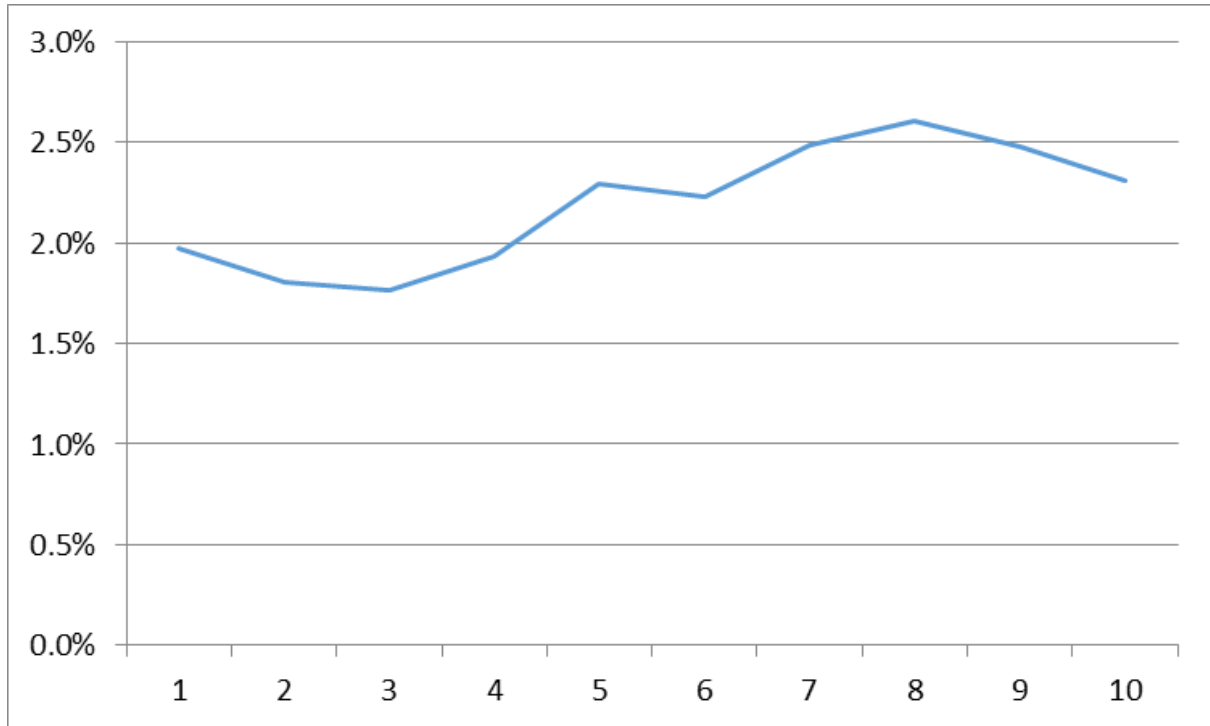
Figure 2: Implied (breakeven) inflation term structure from nominal and indexed CGS yields



Source: RBA, CEG analysis

35. The figures reported in Figure 2 above are average annual rates of increase in CPI over the horizon provided on the horizontal axis. However, implied in this term structure is expected breakeven inflation in each of the future years (“forward inflation”). This is provided in Figure 3 below.

Figure 3: Forward (breakeven) inflation implied by nominal and indexed CGS yields



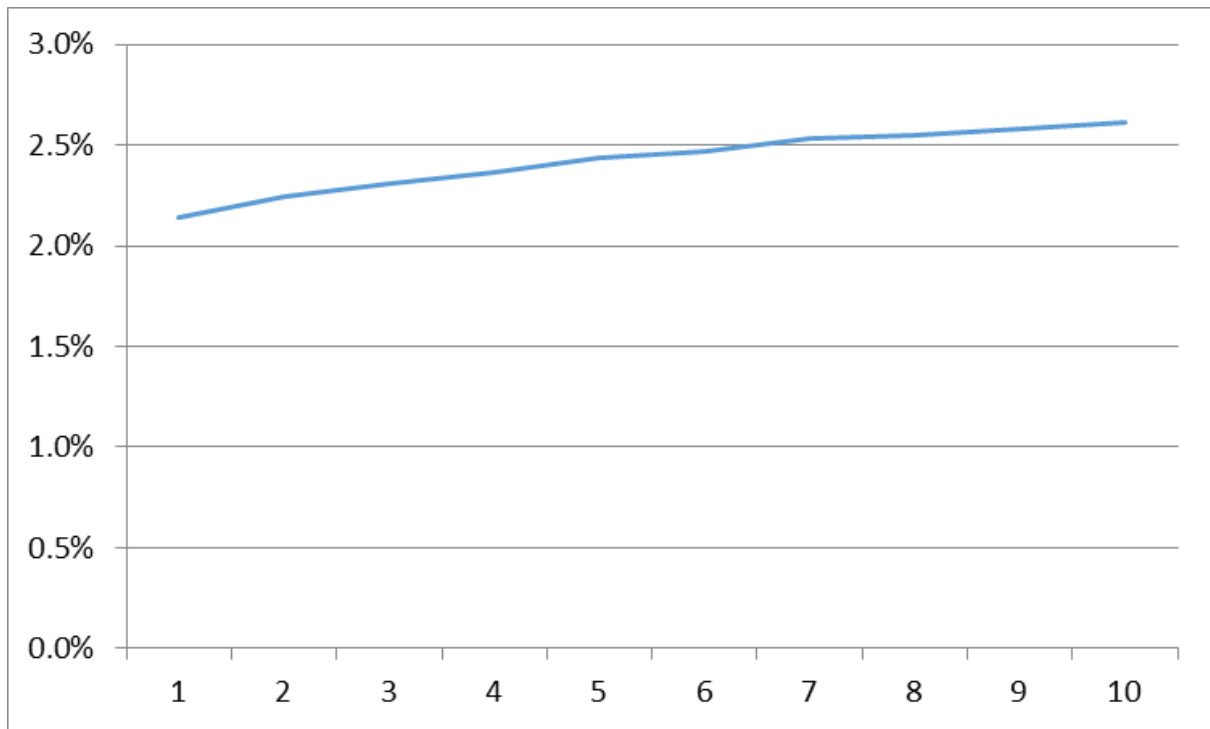
Source: RBA, CEG analysis

36. It can be seen that breakeven inflation is expected to remain below 2.0% over the next 4 years, rising to be approximately equal to 2.5% only after 7 years. This is entirely consistent with the evidence surveyed in our previous reports for SAPN and United Energy, which suggests that the downside risks to inflation exceed the upside risks in the medium term.

3.4 Inflation swaps over the AGN averaging period

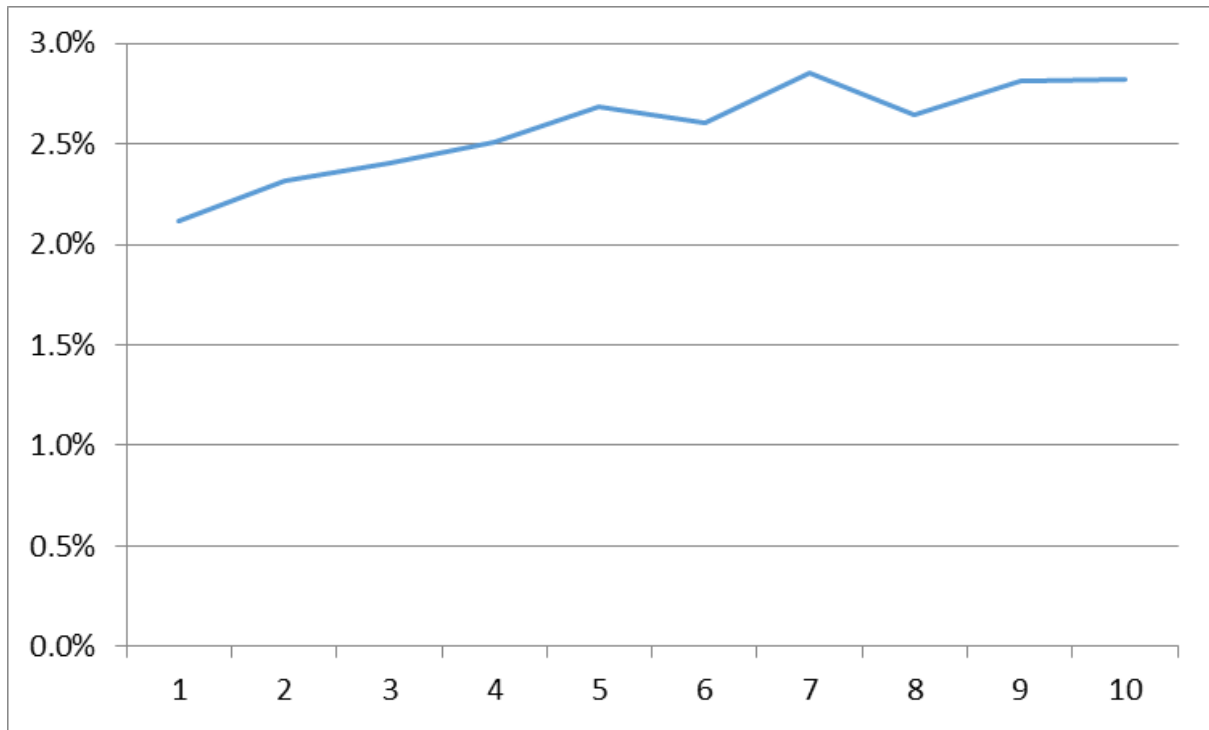
37. Another source of information about investor expectations of future inflation is inflation swaps. The term structure of inflation swaps and the associated forward rates of inflation swaps are provided below.

Figure 4: Implied inflation term structure from inflation swap markets (October 2015)



Source: Bloomberg, CEG analysis

Figure 5: Forward inflation from inflation swap markets (October 2015)



Source: Bloomberg, CEG analysis

38. Beyond 1 year the implied inflation from swap markets rise much faster than from CGS markets, such that implied forward inflation from year 4 to 10 is above the midpoint of the RBA target range (2.5%) and by year 10 is at the top of the RBA range.
39. As explained in our previous reports, implied inflation from swap markets will tend to result in an overestimate of expected inflation. This conclusion is borne out by noting the implied CPI swap forward rate for inflation is well above the midpoint of the RBA target range in years 6 to 10. Consistent with the analysis in our previous reports,¹⁴ we do not believe that this is a plausible best estimate of expected inflation. That is, while there are reasons to believe that the best estimate of expected inflation in 10 years' time will be below the midpoint of the RBA range, there is no reason that we are aware of to believe that the best estimate is for inflation to be at the top of the RBA target range.
40. In any event, it is relevant to note that, in the AGN averaging period, breakeven inflation and CPI swaps are both predicting that inflation will be below 2.5% over the next 5 years – such that average inflation over the next 5 years is well below 2.5%.

¹⁴ For example section 2.1 of our June 2015 report for SAPN, *Measuring expected inflation for the PTRM*

3.5 Conclusion

41. For the reasons set out in our past report we recommend that the inflation forecast used in the PTRM should be a weighted average of the inflation expectations at the 5 and 10 year horizons where the weights are 60% to the five year horizon and 40% to the 10 year horizon – consistent with the weights of debt and equity in the RAB.

Table 1: Weighted average of 5 and 10 year inflation; October 2015

	5 year	10 year	Weighted average
Breakeven	1.97%	2.21%	2.07%

Source: Bloomberg, RBA, CEG analysis

42. However, we also noted in our previous report that the five year estimate of expected inflation should be measured over the period that the RAB RFM is intended to be applied.
43. Consistent with the analysis set out in our previous report for SAPN the inflation forecast that is paired with the nominal cost of debt should be the best estimate, available at the time of the final decision, of the inflation rate that will be used by the AER to escalate the RAB in the RAB roll-forward model and to index revenues over the regulatory period.
44. We understand that AGN’s RAB roll forward will be indexed over the five year period from December 2014 to December 2019. Therefore, the relevant period over which inflation must be estimated is December 2014 to December 2019.
45. In ordinary circumstances, at the time of the AER’s Final Decision, the ABS will not yet have published any historical inflation estimates (or, at best, one quarter of inflation estimates) that will be used by the AER in its RAB roll forward model/revenue indexation over the forthcoming regulatory period. Therefore, in the ordinary course of events, the forecast of inflation that is paired with the nominal cost of debt will be precisely that – a forecast of future Australian Bureau of Statistics (ABS) published rates.
46. At the time of writing we have actual inflation from December 2014 to September 2015 which has grown at an annual rate of just 1.75%. This is clearly much lower than 2.50%. Were the AER to use 2.50% as its best estimate of inflation (and make no other adjustments to its PTRM inputs) then this would mean that the actual nominal return delivered to investors for the first 0.75 years of the regulatory period would be 0.75% (2.50% less 1.75%) lower than the nominal returns used as inputs into the PTRM. This is calculated as:
- 2.50% being the nominal reduction in PTRM derived revenues on the assumption that this would be ‘added back’ in RAB indexation; less

- 1.75% being the actual amount of RAB RFM indexation that will relate to these years.

47. The following table provides the best estimate of 5 year inflation from December 2014 to December 2019 given what we know about actual inflation that has already occurred. This is combined into the best estimate of expected inflation that could be used as an input to the PTRM assuming that it is open¹⁵ to the AER to amend the methodology for estimating expected inflation in the PTRM.

Table 2: Best estimate of inflation

Row	Inflation estimate	
1	10 year breakeven estimate in October 2015	2.21%
2	4.25 year break even	1.91%
3	Actual Dec 14 to Sept 15 (0.75 years)	1.75%
4	5 year RFM forecast (=4.25/5*(row 2)+0.75/5*(row 3))	1.88%
5	60%/40% weight to rows 4/1 above	2.01%

48. Of course, at the time of the AER's decision it should revise rows 2 to 5 to take account of the latest information – including the latest ABS estimate of actual inflation for the December 2015 quarter.

¹⁵ The following section considers how the AER should estimate the nominal inputs to the PTRM or RFM if this is not the case.

4 Critique of AER response to date

4.1 AER response to date

49. The AER has not disputed the veracity of the analysis but has rejected making any change to its approach. The rationale for doing so is that the appropriate place in which to subject our analysis to review is within the next rate of return guideline review.¹⁶

Going forward, the AER would consider a change to inflation forecasting if it was endorsed by stakeholders as part of a comprehensive consultation process. The next rate of return guideline review may be such a suitable process for reviewing the inflation forecasting method.

50. This is similar but not the same as the conclusion reached for United Energy.¹⁷

*Going forward, the AER would consider a change to inflation forecasting in accordance with the consultation **processes mandated by the NER**. The next rate of return guideline review may be a suitable process for also reviewing the inflation forecasting method. [Emphasis added]*

51. In doing so the AER, in recent electricity distribution preliminary decisions, appears to have relied on an argument to the effect that:

- a. the problems identified by CEG are caused by an inappropriate specification of the inflation forecast method in the PTRM - one which creates an alleged downward biased level of expected compensation in current market circumstances;
- b. the PTRM specification of the inflation forecast method can only be amended following a formal review of the PTRM and this is not possible within the current regulatory process; and
- c. any other solution to the problem that has the effect of correcting the PTRM inflation forecast bias (e.g., by amending the nominal cost of debt/equity inputs to the PTRM to offset the bias) is similarly not legally possible.

52. Part c. is implicit in that the AER has not sought to explore whether such a course of action will promote the ARORO and the NGO/NEO.

53. The AER's views on parts a. and b. are encapsulated in the below quote.¹⁸

¹⁶ AER, Draft decision for AGN, November 2015, p. 3-258.

¹⁷ AER, Preliminary decision for United Energy, October 2015, p. 3-258.

¹⁸ AER, Preliminary decision for United Energy, October 2015, p. 3-257 to 3-258.

Under the nominal vanilla approach an inflation forecast is not a direct input in determining the allowed rate of return. As per clause 6.5.2(d)(2) of the NER, subject to achieving the rate of return objective, we are required to determine a rate of return on a nominal vanilla weighted average cost of capital basis. This approach was confirmed in the AEMC's 2012 Economic Regulation of Network Service Providers rule determination.⁸⁰⁷ Given that under the NER inflation is expressly required to be dealt with in the PTRM, it is both consistent with, and unsurprising that, the NER mandates a nominal basis for determining rate of return. The various provisions of the NER have to be read together in a logical manner that recognises the interrelationships between the different components of the AER's determination. For similar reasons, it is not surprising that the rate of return is required to be determined on a vanilla basis, consistent with the fact that taxation is assessed separately under the NER.⁸⁰⁸

Under both the NER and NGR, an inflation forecast is required for modelling revenue over the next regulatory control period. The NER mandates the use of the AER's Post tax revenue model (PTRM). The NGR does not mandate the use of the PTRM, but requires service providers to provide financial information on a nominal basis or real basis or some other recognised basis for dealing with the effects of inflation.⁸¹⁰ Under the NER, the AER's published PTRM must include a method the AER determines is likely to result in the best estimate of inflation.⁸¹¹ Under the NGR, a service provider must propose an estimate on a reasonable basis which is the best forecast or estimate possible in the circumstances.⁸¹²

Any changes/amendments to the PTRM must be done in accordance with the distribution consultation procedures.

CEG's analysis and reasoning raises a number of matters for robust testing including the appropriate inflation estimation horizon and consistency of approach between debt, equity and expenditure forecasts. We consider the research, analysis and reasoning submitted to us should be subject to review through a comprehensive process allowing effective engagement with all stakeholders.

In our recent rate of return guideline development consultation process we raised the inflation method as an issue for potential review. We noted that the indexed bond market had changed since we departed from the Fisher equation, and asked for submissions on whether we should change the approach. We also noted different methods and what other regulators were adopting. In response, stakeholders endorsed the continuation of the current approach. We therefore are satisfied that the current approach is the appropriate approach for this determination.

Going forward, the AER would consider a change to inflation forecasting in accordance with the consultation processes mandated by the NER. The next rate of return guideline review may be a suitable process for also reviewing the inflation forecasting method.
[Emphasis added.]

54. We understand that the AER is saying that irrespective of the merits of the analysis we have presented the only context in which the AER can subject our analysis to “*review through a comprehensive process allowing effective engagement with all stakeholders*” is at a later stage and not in the current determination process. We infer that this is a perceived legal constraint to do with amending the PTRM inflation forecast methodology because we assume that but for such a perceived legal constraint the AER would subject our analysis to *review through a comprehensive process allowing effective engagement with all stakeholders* within the current determination process.
55. We express no opinion in relation to whether such a legal constraint actually exists. However, we note that in AGN’s draft decision the above language is missing (despite the decision being made the following month and the subject matter being the same). We note that the AER does state in United Energy’s preliminary decision that:¹⁹

The NGR does not mandate the use of the PTRM, but requires service providers to provide financial information on a nominal basis or real basis or some other recognised basis for dealing with the effects of inflation.

56. It may be that this distinction explains why the above discussion is missing from AGN’s draft decision. However, it does not explain why the AER reaches the identical conclusion.²⁰
57. In any event, we note that there is an underlying economic presumption embedded in part a. that is not, in our view, correct. The problems that we have identified cannot be said to reside in the PTRM inflation forecast. Rather, they result from the interaction and interdependencies between:
- The PTRM and the inflation forecast method;
 - The nominal cost of equity and debt that is used as an input into the PTRM; and
 - The RAB roll forward model.

¹⁹ AER, Preliminary decision for United Energy, October 2015, p. 3-257.

²⁰ As in Section 1.4, we note that unlike the NER for electricity businesses, the NGR do not prescribe the use of a PTRM for gas businesses (nor has the AER published a PTRM for gas businesses or guidelines for its use). Rather, the key objectives are satisfying the ARORO and the NGO.

58. Consequently, the problems that we have identified can be corrected by changes to any one (or more than one) of these three components of the regulatory regime. Consequently, even if the AER's 'hands are tied' not to correct the problem via a change to the PTRM inflation forecast, this is not a sufficient reason to do nothing. The AER's hands must be tied not to use any of the three means of correcting the problem. That is, it must be the case that the position expressed in c. also holds.
59. Moreover, the position expressed in part c. is inconsistent with the AER's approach to compensating for debt raising costs. In that context the AER has explicitly relied on what it regards as overcompensation built into the timing assumptions of the PTRM in order to not compensate for the efficient costs associated with meeting Standard and Poor's requirements around liquidity and prefunding debt.
60. Moreover, in that context TransGrid's legal advisers explicitly put to the AER the view that it was not legally permissible to make an offsetting change to the inputs to the PTRM in order to undo overcompensation built into the structure of the PTRM.

"[t]he other reason given by the AER for not including the relevant Debt Raising Costs is that the timing assumptions in the post-tax revenue model already overcompensate TransGrid. Again, it is not clear why this is relevant to the assessment under the NER given that the claimed overcompensation from the post-tax revenue model is not considered in clause 6A.6.6 of the NER. As such, the AER cannot rely on this claimed overcompensation when determining TransGrid's allowed operating expenditure when applying clause 6A.6.6 of the NER as it is required to do"

61. In rejecting this position the AER stated:²¹

We do not accept this interpretation of the NER. Under s.16 of the NEL, we must perform our functions in a manner that will or is likely to contribute to the achievement of the NEO. In giving effect to this, we must specify the manner in which the constituent components of our decision relate to each other, and the manner in which that interrelationship has been taken into account in the making of our decision.

*Accordingly, if costs are adequately compensated in one component of our decision, we must take that into account when considering the interrelated components of our decision. **Otherwise, the overall decision may over- or under- compensate the service provider.***

We are satisfied that TransGrid's proposed 'other' debt raising costs are appropriately compensated through the timing assumptions employed in the PTRM as a constituent component of our decision. Neither TransGrid,

²¹ AER, Final decision for Transgrid, April 2015, 3-545 to 3-546.

*Ashurst or Incenta appear to dispute this analysis; instead they argue it is not relevant. We disagree. When we consider whether the total opex forecast reasonably reflects the opex criteria and the rate of return reflects the efficient financing costs of a benchmark efficient business, **we must have regard to the interrelationships between the different aspects of our decision.***

This approach is supported in the reasoning of SCER for proposing the amendments to s.16 of the NEL. These amendments require us to specify the manner in which the interrelated components of our decision have been taken into account. SCER explained that considering constituent revenue components in isolation ignores the importance of interrelationships between components. SCER observed that this would not contribute to the achievement of the NEO and, in the past, has resulted in regulatory failures. [Emphasis added.]

62. Of course, this logic was employed in the context of an aspect of the PTRM resulting in overcompensation. However, it is not obvious why it would not equally apply in the context of an aspect of the PTRM resulting in undercompensation. Therefore, the same logic would suggest that the AER “*must have regard to the interrelationships between the different aspects of*” its decision and that in doing so it is open to the AER to set the inputs to the PTRM in a manner that is likely to contribute to the achievement of the NEO and NGO.
63. We do not offer any legal view on whether Ashurst or the AER is correct in their legal interpretation. However, we do note that as a matter of economics the issues raised above are the same as the issues that are raised in relation inflation forecasting. That is, the AER’s logic above is that it is appropriate to set the inputs to the PTRM for liquidity/prefunding costs in a manner that takes into account how the PTRM is structured and, in so doing, will lead to an appropriate level of compensation. The AER says that this is appropriate because “*otherwise, the overall decision may over- or under- compensate the service provider*”.
64. The same logic would suggest that the AER should set the nominal cost of debt and equity inputs into the PTRM in a manner that takes into account how the PTRM is structured and, in so doing, will lead to an appropriate level of compensation.

4.2 Alternative solutions (other than amending the AER’s inflation forecast methodology)

65. This section describes how other inputs into the PTRM can be amended to ensure that the correct level of compensation for the cost of equity/debt is compensated. Before outlining these solutions we provide a recap of how the components of the regulatory regime interact to deliver an inflation adjusted return.

4.2.1 Compensation for inflation in the regulatory framework

66. The PTRM uses forecast inflation as an input in order to model an assumed path of the nominal RAB over the regulatory period. The higher the inflation forecast used in the PTRM the higher will be the assumed growth in the nominal value RAB and, consequently, the lower the level of compensation provided for in modelled revenues during the regulatory period.
67. The fact that higher inflation leads to lower prices may seem counterintuitive. However, this can be understood by taking into account the interaction with the RBA roll forward model (RFM). When the RAB roll forward model comes to be applied at the next regulatory review, higher inflation over the regulatory period will lead to a higher RAB due to inflation indexation of the RAB.
68. The joint operation of the PTRM and the RAB RFM is such that a nominal return is delivered in two parts:
- A real return (the nominal return less expected inflation) is delivered during the regulatory period; and
 - Compensation for inflation is delivered in the form of a higher RAB in the RFM which is based on actual inflation.
69. Consequently, for any given nominal return (on debt and/or equity) used as an input into the PTRM, higher expected inflation leads to a lower real return and lower nominal revenues over the regulatory period (regulatory period 't'). However, higher expected inflation leads to a higher expected nominal RAB at the beginning of the subsequent regulatory period (regulatory period 't+1'). In this way, the PTRM and the RAB RFM interact in a manner intended to deliver nominal compensation inclusive of the impact of inflation.
70. It is, however, important to note that the two processes will only work together to deliver an expected nominal return equal to the nominal return used as an input to the PTRM if forecast inflation in the PTRM is the best forecast of inflation that will be used in the RFM. That is, the objective for the inflation forecast must be to forecast inflation over the five year period that the RFM will cover.²²

4.2.1.1 *Compensating for nominal debt costs*

71. The cost of debt input into the PTRM is an estimate of the nominal payments that a benchmark efficient entity (BEE) has entered into with lenders.²³ In this context, it is clear that the objective must be to deliver nominal compensation that is sufficient

²² Given the necessity of using lagged inflation in the regulatory process – some of this inflation will be known (published by the ABS) at the time of the regulatory decision.

²³ The BEE is not assumed to have entered into debt contracts with a CPI indexation clause.

to allow these payments to be met. Therefore, for the purpose of forecasting inflation used in the PTRM it is clear that this must be the best estimate of inflation over the 5 year period covered by the next application of the RFM.

4.2.1.2 Compensating for nominal equity costs

72. By contrast, equity contracts are not written to promise a fixed nominal return (or even a fixed real return). Arguably, the objective of the regulatory regime is to deliver to investors the best estimate of the real (inflation adjusted) return that they require and to add to this compensation for actual inflation. If this is accepted the inflation forecast used in the PTRM must be one that, when combined with the nominal cost of equity input, delivers the appropriate real return – which will then be supplemented by compensation for actual inflation in the RFM.
73. In this scenario, the correct horizon over which to estimate expected inflation is the horizon used to arrive at the estimate of the nominal cost of equity. The AER's current practice is to use the prevailing 10 year Commonwealth Government Security (CGS) yield as the proxy for the free rate upon which the nominal cost of equity is built. A 10 year horizon inflation expectation is, naturally, embedded in the prevailing 10 year nominal CGS yield. It follows that the prevailing real risk free rate must be estimated by removing expected inflation over the same 10 year horizon.

4.2.1.3 Weighted average inflation forecast

74. If it is accepted that the objective of the regulatory regime (PTRM plus RFM) is to deliver compensation for a:
- nominal cost of debt input into the PTRM; and
 - real cost of equity (which is not an input into the PTRM itself but which is derived from the nominal cost of equity and the forecast inflation),

then there is a tension between the correct horizon to use for the inflation forecast in the PTRM. The cost of debt must be deflated by a five year horizon forecast of inflation while the cost of equity requires a 10 year horizon forecast of inflation. Consequently, the appropriate inflation forecast used as an input into the PTRM is a weighted average of 5 and 10 year expected inflation with the weights reflecting the assumed proportion of debt versus equity financing (60%/40%).

4.2.2 Alternative means for arriving at appropriate compensation

75. If it is the case that the AER is legally obliged to retain its current methodology for estimating expected inflation in the PTRM it is still possible to correct the problem that we have identified in one of two ways:

- Amend the nominal cost of debt/equity inputs into the PTRM so that, when combined with the PTRM (including the PTRM inflation forecast) and the RAB RFM, they are expected to deliver the correct level of nominal compensation; or
 - Amend (or signal an intention to amend) the RAB roll-forward model to use forecast inflation rather than actual inflation when escalating the RAB (at least for the debt component of the RAB).
76. We assume that if legal constraints prevent the PTRM inflation forecast from being amended the same constraints would prevent the RAB RFM being amended. For this reason we focus on the first of the above two alternative solutions.
77. To see how this would work note that, based on Table 2 the best estimate of expected inflation required to deflate the nominal cost of debt/equity is 1.88%/2.21%. However, under the AER method the nominal cost of debt/equity will be deflated by 2.5% which is 0.62%/0.29% too high.
78. As a consequence, the expected nominal PTRM plus RAB RFM compensation for the cost of debt will be set 0.62% below the nominal cost of debt input into the PTRM. This can be corrected by setting the nominal cost of debt input into the PTRM 0.62% above the target efficient nominal compensation for the cost of debt.
79. Similarly, the expected real PTRM plus RAB RFM compensation for the cost of equity will be set 0.29% below the real cost of equity input into the PTRM. This can be corrected by setting the nominal cost of equity input into the PTRM 0.29% above the target efficient nominal compensation for the cost of debt.



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Appendix A Scope of work

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



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30 December 2015

Dr Tom Hird
Competition Economists Group
234 George Street
SYDNEY NSW 2000

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.

AGN wishes to engage you to prepare an expert report in connection with AGN's access arrangement revision proposal, in particular in relation to expected inflation.

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 and depreciation 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 as a weighted average of the return on equity and the return on debt and 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)).

The return on equity and the return on debt are to be estimated such that they contribute to the allowed rate of return objective (Rule 87(6) and (8)).

It is the AER’s practice to apply the *nominal* rate of return to an *indexed* capital base. As a result, it is necessary to deduct from the building blocks an amount on account of expected inflation to prevent double counting. An estimate or forecast of expected inflation is required to index the capital base and to effect this deduction.

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 access arrangement revision proposal, AGN indicated its intention to adopt a market based estimate of expected inflation (by applying the same methodology set out in your report for SA Power Networks dated June 2015 and entitled *Measuring expected inflation for the PTRM*) if the June 2015 quarter inflation outcome did not materially increase from the March 2015 quarter inflation outcome (which it did not).



In its Draft Decision, the AGN continued its previous approach of estimating expected inflation by reference to the mid-point of the Reserve Bank of Australia's short term inflation forecasts and inflation targeting band rather than adopting a market based estimate.²⁴

Opinion

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

- 1 Your opinion as to the appropriate methodology for constructing the best estimate of expected inflation for use in the building block approach to calculating AGN's total revenue under the National Gas Rules (having regard to the requirements of the Rules and the NGO).
- 2 A calculation of the estimate of expected inflation using that methodology (using a placeholder averaging period of October 2015).
- 3 Your comments on the Draft Decision insofar as it relates to expected inflation.

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**).

²⁴ See pages 3-262 and 3-263 of the Draft Decision.



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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;
- identify the questions that the expert has been asked to address;
- set out separately each of the factual findings or assumptions on which the expert's opinion is based;
- set out each of the expert's opinions separately from the factual findings or assumptions;
- set out the reasons for each of the expert's opinions; and
- 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