Response to AER's Preliminary Position paper on regulatory treatment of inflation

Energy Networks Australia

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1   Introduction

Energy Networks Australia thanks the Australian Energy Regulator (AER) for the opportunity to provide this submission on its Preliminary Position paper[1] on the regulatory treatment of inflation.

The Preliminary Position paper proposes no change to current regulatory practice in respect of inflation. More specifically, the Preliminary Position paper:

» Proposes to retain the AER's current approach to estimating expected inflation with some minor modifications;[2] and

» Proposes no change to the current treatment of inflation within the Post-tax Revenue Model (PTRM) and RAB Roll-forward Model (RFM).

We note the focus of Energy Networks Australia continues to be on the first issue - ensuring that the regulatory process uses a best estimate of expected inflation. This is key to ensuring that network service providers (NSPs) are allowed to recover efficient financing costs and consumers pay no more or less than they should. If stakeholders have this level of comfort, then further adjustments to the regulatory framework, such as that contemplated in the second point above, are less important.

Energy Networks Australia acknowledges the consultation process but nonetheless is concerned that the Preliminary Position paper:

» Does not fully address some of the issues and evidence put forward by NSPs, including about the weaknesses of the current approach to estimating expected inflation; and

» Draws a number of conclusions that are not supported by the evidence.

This submission identifies specific issues with the analysis the AER has relied on when arriving at the conclusions set out in the Preliminary Position paper. These issues relate to the following:

» The evidence relied on by the AER to reject the bond breakeven approach (Section 2).

» The AER's Preliminary Position that a glide path approach should not be adopted, and the evidence and analysis relied upon by the AER when reaching this conclusion (Section 3); and

» The AER's analysis of submissions by some stakeholders that the use of an estimate of expected inflation calculated using a 10-year geometric average, and

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[1] Published on 13 October 2017.
[2] The AER proposes to monitor Consensus Economics consensus forecasts of inflation for evidence of any significant deviation of long-run inflation expectations away from the mid-point of the RBA's target inflation range. The AER proposes that in the event of any such change, it would seek further advice from the RBA on how it should estimate expected inflation.

applied to a five-year regulatory control period, can result in over/under-recovery by NSPs (Section 4).

Energy Networks Australia submits that the AER should address these matters in its final decision on the regulatory treatment of inflation to enhance the capability of the decisions being accepted by stakeholders.

2   AER conclusions in relation to the bond breakeven approach

2.1   Anchoring expectations to the mid-point of the target range

The Preliminary Position paper cites the conclusion of the ACCC/AER 2017 working paper (#11) that "long-term inflation expectations are anchored within the inflation target band,"[3] and repeats that conclusion several times throughout the Preliminary Positions paper. This conclusion forms an important basis for accepting the AER's current RBA mid-point method for estimating expected inflation, and rejecting the bond breakeven approach (which was supported by the majority of NSPs).

The Preliminary Position paper notes that the Working Paper's conclusion is based largely on the concept of "relative congruence" that was developed therein. However, that criterion, and consequently the conclusions that are drawn from it, is circular. This was pointed out in the submission from SA Power Networks, CitiPower, Powercor and Australian Gas Networks as follows:

> *The Working Paper states (Para 21) that "Relative congruence refers to the relative closeness of correspondence or the relative closeness of similarity of a method's estimator with 10 year market expectations of inflation". This appears to be a circularity in that the task at hand is to determine which estimate of expected inflation is best. The definition of "relative congruence" seems to imply that there is an observable "best" or "true" expected inflation against which each of the proposed estimation methods can be compared. The favoured method would then be that which is closest to or most congruent with this best or true market expectation. However, in our view there are a number of problems with this approach:*
>
> *A. If there existed a best or true expected inflation figure, against which the various estimation methods could be compared, there would be no need for any of the estimation methods – we would simply use the figure that we know to be best or true. Rather, the reason there are different estimation methods is that there is no observable best or true figure. Thus, there is a logical problem with the relative congruence criteria.*
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> *B. Because there is no objective best or true figure, against which the various estimation methods can be compared, the Working Paper tends to compare estimates from different methods against each other. But if the quality of method A is to be judged by the closeness of its estimates to those from method B, it would seem (logically) that the estimates from method B should simply be adopted. That is, if method B is the standard by which other methods are judged, the evaluator has already implicitly determined that method B is best.*

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[3] Preliminary Positions paper, p. 27.

C. *The Working Paper also implements its relative congruence criterion by simply listing various problems and issues that might be raised in relation to each method. There are three problems with this approach:*

   a. *It is not clear how this has anything to do with the Working Paper's own definition of relative congruence, set out above;*

   b. *There is no quantification of the effect that each issue might have on the final estimate, just an enumeration of things that might be issues; and*

   c. *It is applied asymmetrically. There is a rich literature that discusses the relative merits of the other approaches, pointing out the strengths and weaknesses of each, and discussing the market conditions and circumstances in which each approach might work best. But there is no literature relating to the AER approach, because that approach is unique to the AER and has not been considered in the literature. The fact that there is more commentary about the other approaches is then interpreted as support for the AER approach. The fact that the AER approach implies an unreasonably fast reversion to the mean when current inflation is relatively high or low is not considered at all.*

   d. *The analysis all relates to long run averages, rather than an analysis of which approach is likely to produce the best estimate in the prevailing market conditions.[4]*

These concerns with the AER's application of the "relative congruence" criterion, and the conclusions that have been drawn from it, have not been addressed in the Preliminary Positions paper. We believe these are important issues need to be considered and explained by the AER for the engagement process to deliver an estimate of expected inflation that is capable of being accepted by all stakeholders.

2.2   Problems identified with bond breakeven approach

The Preliminary Position paper sets out a large number of potential problems with the bond breakeven approach, including the following:[5]

» There is uncertainty over the yield curve fitting model required to estimate the yields on nominal and indexed government bonds with a tenor of exactly 10 years.

» The potential for the presence of an illiquidity premium in indexed government bond yields.

» The potential for the presence of an inflation risk premium in nominal and indexed government bond yields.

» The potential for nominal and indexed government bonds to have different sensitivities in bond prices to changes in yields (the so-called 'convexity effect').

» The potential for indexed bonds to reflect changes in inflation with some lag.

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[4] Submission from SAPN, CitiPower, Powercor and AGN, pp. 7-8.
[5] Preliminary Positions paper, Table 6, pp. 55-7.

» This inflation indexation lag can also introduce an inflation risk premium into the yields on indexed government bonds.

» The potential for mismatches in the timing of cash flows (coupon payments) associated with nominal and indexed government bonds to distort the estimate of expected inflation.

» The potential for short-term changes in inflation expectations to distort estimates of long-term inflation expectations when coupon-paying bonds are used to calculate breakeven inflation.

» Changes in the demand and supply of nominal and indexed government bonds for reasons unrelated to changes in inflation expectations may distort the estimates of breakeven inflation.

» The potential that CPI (which is the measure of inflation used in indexed government bonds) may not be a perfect measure in true inflation experienced by investors, in which case breakeven inflation may not be a good estimate of the market's true inflation expectation.

In summary, the AER appeals to several theoretical concerns about the bond breakeven approach. Energy Networks Australia notes that:

» Some of the AER's concerns could in principle be valid. However, the AER presents no evidence on the materiality of those concerns, including when considered overall.

» Many of the potential shortcomings of the bond breakeven method listed by the AER are identified by reviewing the academic literature. However, as noted in the quote provided in the previous section, the AER's preferred method for estimating expected inflation has not been the subject of any academic consideration because it is not a common approach to estimating expected inflation. Therefore, it is not surprising that there is no academic literature that documents the shortcomings of the AER's preferred RBA mid-point approach. The absence of any such literature should not be interpreted as an endorsement of the AER's preferred approach (vis-à-vis other approaches, such as the bond breakeven approach), but could in fact highlight a concern that the AER's approach is not commonly used in practice (including among regulators).

» A number of the studies cited by the AER do not relate to Australia and/or are more than a decade old. The AER has in the past not accepted overseas evidence cited by NSPs in their submissions to the AER as relevant if NSPs have not justified that the overseas evidence is timely or applies well to the Australian context. However, the AER has not applied the same standard to the overseas studies that it cites when raising concerns about the bond breakeven approach.

» When assessing the bond breakeven approach, the AER holds this approach up to a very high evidentiary standard. The AER does not subject its preferred approach to the same level of scrutiny or criticism, which is particularly important given the lack of review noted above.

2.3   Use of RBA evidence to cast doubt over reliability of the bond breakeven approach

During the review process, the AER wrote to the RBA seeking its views on the different methods proposed to estimate expected inflation. The Preliminary Positions paper draws on aspects of the RBA's response to the AER to justify its preferred approach and to cast doubt over the reliability of the bond breakeven approach. Energy Networks Australia is concerned that the AER has relied on only those aspects of the RBA's response that favour its preferred approach, and appears to have drawn incorrect inferences from some of the evidence cited by the RBA.

For example, the AER notes that the RBA's response states that market-based approaches "have several shortcomings that probably make them unviable alternatives to the current method." The RBA does indeed state this. However, the RBA also notes that none of the approaches for estimating expected inflation are perfect, and that the AER's preferred approach also has shortcomings. Specifically, the RBA notes that:

> *Firstly, the mid-points of the published forecast ranges are not necessarily the RBA's central forecasts. Secondly, if actual long-term inflation expectations were to move notably for a sustained period, it would not be valid to use the Bank's target as a proxy.[6]*

Whilst the AER does make some attempt to address the RBA's warning that the RBA's inflation target should not be used if long-term inflation expectations have shifted, the Preliminary Positions paper does not address the more fundamental point made by the RBA that the mid-point of the range does not necessarily represent the RBA's central forecast of expected inflation. It is quite possible that the RBA's central forecast of expected inflation beyond the second year published is above or below the mid-point of the target range.

However, since that central forecast is never published by the RBA, the AER's adoption of the mid-point of the target range from the third year onwards is simply an assumption about the RBA's central forecast. The AER does not know whether the target towards which its method moves is correct in the sense of being the expectation of the RBA. The RBA makes clear that such an assumption about the mid-point being its best estimate of expected inflation is not always appropriate.

The Preliminary Position paper focusses on two sources of potential bias in bond breakeven estimates referred to by the RBA:[7]

» The presence of an inflation risk premium in nominal yields, which the RBA notes would bias breakeven inflation estimates up; and

» The presence of an illiquidity premium in nominal yields, which the RBA notes would bias breakeven inflation estimates down.

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[6] RBA letter to AER, 5 July 2017, p. 2.
[7] RBA letter to AER, 5 July 2017, p. 2.

The Preliminary Position paper contends (without evidence) that the *possibility* of such bias is sufficient to disqualify the bond breakeven approach.

The RBA's response refers the AER to some research undertaken by the RBA[8] that shows that over a long-term (i.e. 10-year) horizon, of the kind that the AER is concerned with, the inflation risk premium seems to explain much of the variation in bond breakeven estimates:

> *Movements in the breakeven rate could arise from changes to long-term inflation expectations, the liquidity premium, or the inflation risk premium. Previous work undertaken by the RBA has found that, at long horizons, much of the variation in the long-term bond breakeven rate is due to changes in the inflation risk premium rather than changes in expectations.[9]*

This can be seen in the bottom panel in Figure 1 below, which seeks to decompose the breakeven inflation estimate into expected inflation and the inflation risk premium.

It is important to recognise that the authors of this RBA study assume that any illiquidity premium that exists in relation to indexed government bonds is incorporated into their measure of the inflation risk premium.[10] Hence, the inflation risk premium estimated by the RBA researchers is to be interpreted as *net* of any illiquidity premium.

The RBA's analysis shows that the estimated inflation risk premium (the pink curve) has generally been positive.[11] This suggests that the 10-year estimates of breakeven inflation are an upward-biased estimate of expected inflation. In other words, this evidence indicates that true expected inflation over a 10-year horizon is *lower* than that implied by estimates of 10-year breakeven inflation. This would make breakeven inflation an *upper bound* for true inflation.
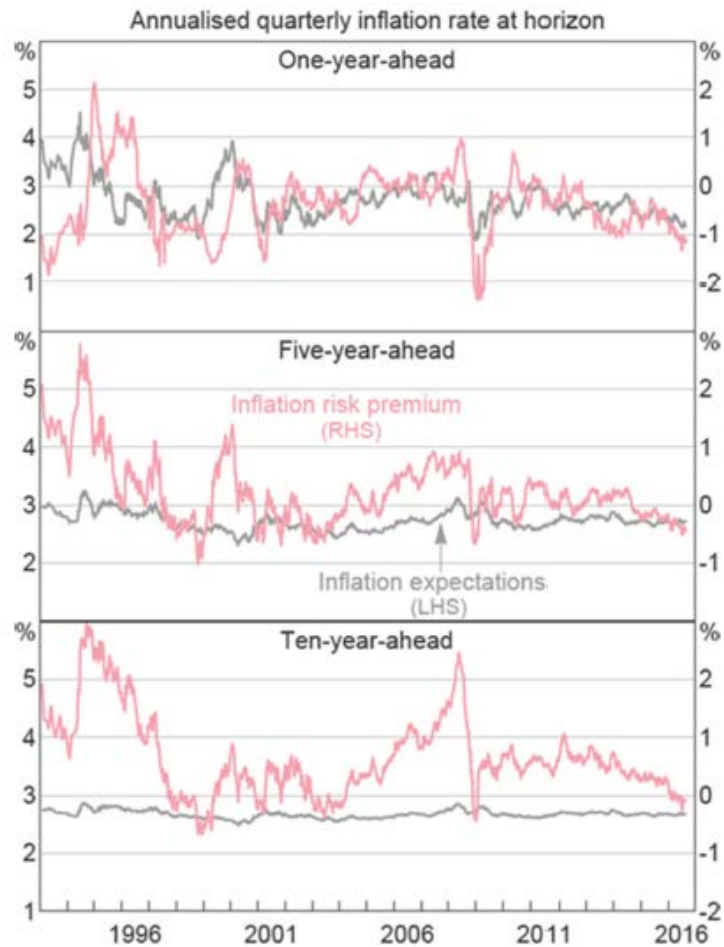
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[8] The original research was completed in 2011, but subsequently extended in 2016.
[9] RBA letter to AER, 5 July 2017, p. 2.
[10] Finlay, R. and S. Wende (2012), Estimating inflation expectations with a limited number of inflation-indexed bonds, International Journal of Central Banking, June, p. 112.
[11] According to the authors of this study, the illiquidity premium on inflation indexed bonds "provides a plausible explanation" for their negative estimates of the inflation risk premium (see Finlay and Wende, 2012, p. 127). In other words, the estimated inflation risk premium incorporates estimates of the illiquidity premium.

Figure 1   Inflation expectations and inflation risk premia

Annualised quarterly inflation rate at horizon

Source: Finlay and Wende (2011), cited in Preliminary Positions paper, p. 58

The AER uses this evidence in the Preliminary Positions paper to argue that breakeven inflation estimates are biased, and therefore should be rejected. However, the AER does not consider the direction of the bias. Instead, the AER should have recognised that:

» This is evidence that true 10-year inflation expectations may be *lower* than estimates of 10-year breakeven inflation — because the inflation risk premium, net of any illiquidity premium, has generally been positive;

» In present market conditions, the breakeven inflation (upper bound) is lower than the AER's estimate of expected inflation; so

» True inflation expectations are, in present market conditions, lower than the AER's estimate of expected inflation.

Energy Networks Australia submits that this evidence from the RBA, which the Preliminary Position paper cites, actually provides support for the notion that the bond breakeven inflation approach produces more reliable estimates of inflation expectations over a 10-year horizon than does the AER's RBA mid-point approach.

2.4 Other considerations

Finally, Energy Networks Australia notes that the bond breakeven approach uses the same data on nominal government bonds that the AER already uses in its regulatory determinations (for the purpose of estimating the risk-free rate) together with inflation-indexed government bonds. The fact that the breakeven approach uses data that is already used by the AER elsewhere in its regulatory process is relevant to its use for the purposes of estimating expected inflation. This is particularly the case where there is no recognition of the AER approach in the literature, there is a lack of clear evidence on overall materiality of issues raised by AER on the breakeven approach, and there is evidence that the AER approach produces poor estimates in some market conditions.

Although not relevant to determining a best estimate of inflation, we note the comments in the Preliminary Positions paper that "inflation risk" associated with any mismatch between a nominal trailing average for debt and an "on the day" inflation estimate is accounted for in its estimates of equity beta and credit rating. The paper does not however set out the evidence in support of this position.

Nonetheless, we note the change in the approach to estimating the cost of debt from 2013 onwards. Given this, if it were the case in principle that inflation risk is accounted for in beta estimates, then in practice estimates of beta using data from prior to the implementation of the current Rate of Return Guideline would not represent the level of systematic risk faced by the benchmark efficient entity going forward. This is because they would represent a different regime for debt, where nominal debt estimates were formed on the same "on the day" method as is currently the case for inflation.

3 The glide path approach

3.1 AER's assessment of the evidence of the length of the glide path

When discussing the idea of a glide path between the RBA's second-year inflation forecast and the mid-point of the RBA's target range, the Preliminary Position paper notes that the length of the glide path should be informed by evidence on how quickly short-term inflation expectations revert to the mid-point of the RBA's inflation target range. The Preliminary Position paper then concludes that there is good evidence that this reversion occurs rapidly, and so a glide path may not be warranted:

> *We have reviewed the available evidence on the rate of reversion to the midpoint of the target band. This evidence suggests that reversion is relatively rapid in Australia - within one to two years. Further the evidence suggests that the midpoint of the target band is the best estimate of expected inflation beyond two years. A glide path approach would therefore not provide the best estimate of expected inflation.[12]*

Energy Networks Australia submits that the evidence referred to in the quote above is not persuasive and therefore does not support the conclusion in the Preliminary Position paper that a glide path "would not…provide the best estimate of expected inflation." For example, the Preliminary Position paper suggests that:

> *In Australia, transmission of monetary policy occurs at a lag but is typically shown to be one to two years.[13]*

In support of this contention, the Preliminary Position paper refers to a RBA document entitled *The Transmission of Monetary Policy*. This document is a non-technical four-page summary of how the RBA conducts monetary policy. The only reference in this document to the speed of monetary policy is the following sentence:

> *Some estimates suggest that it takes between one and two years for monetary policy to have its maximum effect.[14]*

No further evidence is provided. Yet, the Preliminary Position paper relies on this statement when concluding that no glide path should apply.

The Preliminary Position paper also cites a paper by Tulip and Wallace (2012), which it suggests justifies the application of no glide path. One of the key objectives of this paper is to test how well the RBA's first-year and second-year inflation forecasts, and the mid-point of the target range, succeed in predicting actual inflation.[15] The results

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[12] Preliminary Positions paper, p. 13.
[13] Preliminary Positions paper, p. 46.
[14] RBA, *The Transmission of Monetary Policy*, p. 2.
[15] As the Preliminary Position paper (p. 90) notes: "Tulip and Wallace find that RBA first year forecasts of CPI inflation significantly outperform CPI inflation forecasts based on a random walk ($p = 0.00$) and the midpoint of the inflation target band ($p = 0.04$). RBA second year forecasts of CPI inflation significantly outperform forecasts based on a random walk ($p = 0.03$)

that the AER cites from this paper provide no information on how quickly *expected* inflation reverts to the mid-point of the RBA's target range (or indeed if such reversion occurs at all). Hence, this study is not relevant to the question of how long the glide path should be.

The Preliminary Position paper cites a third study, by Tawadros (2013) which, according to the AER:

> *…finds that the RBA forecasts produce much lower forecasting errors than the forecasts made by the three other private sources.*

Once again, it is difficult to see how this finding is relevant to the question of how quickly (if at all) the market's *expectations* of inflation revert to the mid-point of the RBA's inflation target range.

In summary, the AER appears to have relied on unconvincing evidence when concluding provisionally that a glide path approach should not be adopted.

3.2   Potential approaches for implementing a glide path

During the stakeholder workshop to discuss the AER's Preliminary Position, held on 31 October 2017, five alternative approaches for determining the length of the glide path were discussed:

1. Adopt a fixed glide path length in all decisions. This would be akin to the approach adopted by the New Zealand Commerce Commission, which adopts a three-year glide path. The AER would need to determine the length of this glide path by some method.

2. Use the trend between the RBA's one-year ahead forecast and two-year ahead forecast to extrapolate out to the midpoint of the RBA inflation target range. For example, suppose the one year-ahead forecast was 1.0% and the two-year ahead forecast was 1.5%, the increment between these two forecasts is an annual change of 0.5%. The glide path could then be formed by extrapolating the two-year ahead forecast out to 2.5% at a rate of 0.5% p.a. The mid-point of the RBA range would be reached by year 4 in this example. One challenge with this approach is that it is unclear what the rate of extrapolation from year two should be if:

    a. The two-year ahead forecast is below (above) the mid-point of the RBA inflation target range; and

    b. There is a negative (positive) trend between the one-year ahead and two-year ahead forecasts.

    This is because the extrapolation in such cases would take future estimates further away from the 2.5% mid-point.

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but did not significantly outperform forecasts based on the midpoint of the inflation target band. The latter result suggests that there is a relatively rapid reversion of CPI inflation to the mean and such an outcome is consistent with the successful targeting of the inflation rate."

3. Specify some bounds around the mid-point of the inflation target range,[16] and then apply a glide path only if the two-year ahead RBA forecast lies outside these bounds. Under this approach, the AER would still need to determine the length of the glide path.

4. Undertake statistical empirical analysis to estimate how quickly actual inflation reverts to the mid-point of the RBA inflation target range, and then use this estimate of the rate of mean reversion to determine the length of the glide path. This empirical analysis could be updated periodically to ensure that the length of the glide path is informed by recent evidence.

5. Use the bond breakeven approach to estimate expected inflation over the next one year, two years, three years, and so on. These estimates could then be used to infer expected inflation for years one, two, three, and so on. This process would provide an estimated term structure of expected inflation. This term structure could then be used to estimate how quickly the market expects inflation to revert to the mid-point of the RBA's inflation range. This would then form the basis of the glide path from the RBA two-year ahead forecast to 2.5%. It is important to recognise that under this approach, estimates of breakeven inflation would be used only to determine the length of the glide path—not the direct point estimate of expected inflation to be used in the AER's PTRM when determining revenue allowances as per the Energy Networks Australia's preferred approach.

The AER has expressed interest in receiving further submissions and evidence on how a glide path approach could be implemented in practice. Energy Networks Australia does not put forward a preferred glide path approach at this time, but would be willing to work constructively with other stakeholders and the AER to investigate further the pros and cons of the alternative options for implementing a glide path.

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[16] One possible set of bounds would be the RBA's inflation target range, 2.0% to 3.0%.

4 Use of a 10-year geometric mean

A number of NSPs[17] submitted that the use of a 10-year geometric average inflation rate (as the AER's estimate of expected inflation) combined with a five-year regulatory control period, can lead to over/under-recovery of the *real returns* intended by the AER in any given regulatory period—even if the AER estimates inflation expectations perfectly *and* actual inflation turns out to be exactly in line with expectations. The NSPs provided in their submission a simple worked example that demonstrated this.

The rationale underpinning the example provided by the NSPs is as follows:

» The AER's estimate of expected inflation is calculated as a 10-year geometric average of the RBA's one-year ahead inflation forecast, two-year ahead inflation forecast, and the mid-point of the AER's target range (2.5%) from year three to year 10.

» If the RBA's one-year ahead inflation forecast and/or two-year ahead inflation forecast is lower than 2.5%, then there is under-compensation in years 1 and/or 2, followed by over-compensation in years 3 to 5. This is because expected inflation is below the geometric mean in years 1 and/or 2 and above the geometric mean in years 3 to 5. Thus, the under-compensation in the early years of the regulatory control period starts to be "caught up" in the subsequent years.

» However, since allowed returns are reset at the end of year 5, the earlier under-compensation is not fully caught up. It is not possible to catch up the under-compensation within the five-year regulatory control period, because the quantum of under-compensation is driven by ten years of inflation expectations.

The Preliminary Position paper contends, with the aid of the AER's own worked example, that:[18]

» The worked example provided by the NSPs actually demonstrates that if the nominal rate of return assumes a 10-year term, then inflation expectations need to be estimated over a 10-year horizon in order to ensure consistency; and

» Under such a consistent treatment, there is no over/under-recovery of the real rate of return targeted by the AER.

It appears that the AER's conclusion that its approach does not result in over/under-recovery follows from an erroneous assumption baked into the AER's example. Specifically, the AER's example *assumes* a constant real rate of return throughout its worked example:

> *We hold constant the real rate of return at 3.66 per cent, which means the nominal rate of return would be 5.74 per cent in years one and two and 6.25 per cent in years three to ten. We can then calculate the average*

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[17] SA Power Networks, CitiPower, Powercor and Australian Gas Networks.
[18] Preliminary Positions paper, pp. 65-8.

nominal WACC as 6.15 per cent, equal to the figure in the original example.[19]

This assumption would only be appropriate if the AER actually sets a real allowed rate of return. However, as the Preliminary Position paper itself acknowledges, the AER does not set a real allowed rate of return. Under the Rules, the AER is *required* to set a nominal allowed rate of return.[20] The AER then applies an estimate of expected inflation when setting allowed returns. By combining a nominal allowed rate of return with an estimate of expected inflation, the AER *targets* (rather than fixes) a real allowed rate of return. Hence, it is not appropriate for the AER's worked example to assume that a real allowed rate of return is delivered in each year of the regulatory control period. Doing so assumes away the problem associated with a 10-year geometric mean that the NSPs that submitted on this issue sought to bring to the AER's attention.

In the worked example provided by the NSPs in their joint submission, the nominal allowed rate of return is held constant through the regulatory control period. This is acknowledged in the Preliminary Position paper:

> *The SAPN example fixed the nominal rate of return at 6.15 per cent. This meant the real rate of return varied from years one and two (4.07 per cent) to years three to ten (3.56 per cent).[21]*

This is appropriate and consistent with the requirement under the Rules that the AER determine a nominal allowed rate of return. The worked example then solves for the effective real rate of return delivered by this constant nominal allowed rate of return and the AER's estimate of expected inflation (calculated using a 10-year geometric average), and demonstrates that this effective real rate of return can differ from the real rate of return targeted by the AER, depending on whether the RBA's one-year ahead and/or two-year ahead inflation forecasts are higher or lower than 2.5%.

Due to the error in the construction of the AER's worked example, the Preliminary Position paper has not addressed properly the concern raised by NSPs about the use of a 10-year geometric mean to estimate inflation expectations, when these estimates are being applied to set allowed revenues over a five-year regulatory control period.

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[19] Preliminary Positions paper, pp. 67.
[20] Preliminary Positions paper, p. 20.
[21] Preliminary Position paper, footnote 136.