Australian Gas Networks

Final Plan Attachment 9.2

Inflation

December 2016

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1. Introduction

The estimate of expected inflation influences the determination of a number of building blocks, including depreciation and the return on capital. If the estimate of expected inflation used to derive the building blocks is not accurate and consistent with investors' inflation expectations as implied in the nominal rate of return, the result will be a potential under-recovery of costs (if the forecast of inflation is too high) or an over-recovery (if the forecast is too low).

Under the Australian Energy Regulator's (AER's) current approach using the post-tax revenue model (PTRM)[1], the estimate of expected inflation is an estimate of inflation expectations in the nominal rate of return. It is used to convert the nominal rate of return to a real rate of return and (through a negative adjustment to depreciation) to avoid the double counting that would otherwise arise from applying a nominal rate of return to an inflation-adjusted capital base.

If the estimate of expected inflation used in one part of the building block determination (to make negative adjustments through the PTRM) is significantly different from inflation expectations used in other parts (the nominal rate of return), there will be a mismatch and a potential under or over-recovery of revenue. The estimates of inflation used in the building block determination must be consistent. As is explained below, basing all estimates on the inflation rate implicit in bond rates is the most consistent course to take.

As explained in our Final Plan, we are concerned that the AER's current approach to estimating inflation, relying on Reserve Bank of Australia (RBA) short-term inflation forecasts and long-term inflation targets, does not produce an estimate of expected inflation which is consistent with inflation expectations in the market and therefore the nominal rate of return. Further, the AER's approach would appear to imply investors for an extended period in 2016 accepted negative real bond rates, despite the fact that positive indexed bonds were available in the marketplace.

The consequence is that the (negative) adjustment made to total revenue for expected inflation is larger than the compensation the market expects we will receive for inflation during the course of the next (2018 to 2022) Access Arrangement (AA) period. As a result, service providers cannot expect to recover at least its efficient costs.

We consider that market-based (break-even) approach provides the best estimate of expected inflation possible in the circumstances. As at September 2016, the market based approach would give rise to an estimate of expected inflation of around 1.6%. We have however applied the AER approach giving rise to an estimate of 2.39% in this Final Plan pending the outcome of further engagement with the AER and stakeholders on this important matter, including by way of the review of the AER's approach to the estimate of expected of inflation which it announced on 15 December 2016. We also note that the approach to estimating expected inflation is currently subject to legal review.[2]

We will continue to monitor this issue and update our approach, if required, once there is further clarity on this matter (including through engagement on our Final Plan and the AER's review of its approach).

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[1] It is noted that unlike under the National Gas Rules, there is no requirement in the National Gas Rules to use the AER's PTRM, but the AER's practice has been to apply its PTRM in gas access arrangement decisions.

[2] In the ActewAGL Distribution merits review application ACT No 6 of 2016.

We rely upon the following expert reports submitted with our Final Plan Proposal:

- PwC, *Estimating Expected Inflation Using the Breakeven Method*, December 2016, provided at Attachment 9.3 to the Final Plan;
- CEG, *Best Estimate of Expected Inflation*, September 2016, provided at Attachment 9.4 to the Final Plan; and
- CEG, *Inflation Compensation, Addendum to September Report*, December 2016, provided at Attachment 9.5 to this Final Plan.

We also submit and rely on the following earlier CEG reports:

- CEG, *Measuring expected inflation for the PTRM*, January 2016, provided as Supporting Information 1.
- CEG, *Measuring expected inflation for the PTRM*, June 2015, provided as Supporting Information 2.

2. Regulatory Framework and the Operation of the PTRM

Under Rule 76 of the National Gas Rules (NGR), the annual building block revenue requirement for each regulatory year of a regulatory control period must be determined using a building block approach, under which the building blocks include a *"return on the projected capital base"* and "*depreciation on the projected capital base*" (return of capital).

Pursuant to the rate of return rules, the allowed rate of return is to be determined on a nominal vanilla basis.[3] This nominal rate of return is applied to an indexed regulatory asset base (RAB). However, the effect of this combination is a double compensation for inflation, once through the nominal rate of return and once through the indexation of the RAB across regulatory periods.

The AER addresses this in the PTRM by taking expected inflation (estimate) out of the annual revenue requirement for the forthcoming period (through the depreciation building block), and then returning it by indexing prices to actual inflation through the forthcoming period, and indexing the RAB to actual inflation at the commencement of the next AA period.

Importantly, any estimates, including the estimate of expected inflation, must be arrived at on a reasonable basis and must represent the best forecast of estimate possible in the circumstances. (NGR 74(2)).

As CEG explain[4], the AER's PTRM and Regulatory Asset Base (RAB) roll forward model work together to deliver compensation for inflation as follows:

1. take a nominal input for the cost of debt and equity;
2. deduct the estimate of expected inflation to arrive at a real return which is then embedded in the real regulated revenue path; and
3. provide nominal compensation that is equal to:
   - the real return derived in step 2; plus
   - in the RAB roll forward, compensate for the inflation that actually occurs (out-turn inflation) over the regulatory control period.[5]

The real revenue path in Step 2 is the final output of the PTRM model.

In the AER's Draft Decision for AusNet Services distribution, they recognised that the objective of the expected inflation estimate is to convert the nominal return to a real return (step 2 above).[6] As noted above, this is necessary to avoid a double counting of inflation.

The AER further explained the operation of its PTRM and Roll Forward Model (RFM) and the role of expected inflation in its recent Explanatory Statement – Proposed amendments to electricity distribution roll forward model released on 31 August 2016:

> *"A nominal WACC, not a real WACC, is the input to the PTRM at the start of each AER final decision. The real WACC (which drives PTRM outcomes) is derived from the*

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[3] NGR Rule 87(4(b)).

[4] CEG, *Best Estimate of Expected Inflation*, September 2016, Section 3. Provided at Attachment 9.4 to this Final Plan.

[5] This is compensated primarily in the RAB roll forward used to set the opening RAB at the beginning of the next regulatory period but also (to a small extent) in the form of price escalation for inflation during the regulatory period.

[6] AER, *Draft Decision AusNet Services Transmission Determination 2017-18 to 2021-22: Attachment 3 – Rate of Return*, July 2016, page 3-154.

nominal WACC by deducting the expected inflation rate. Hence, an overestimate of inflation means the real WACC will be too low (and vice versa). However, the forecast inflation and the nominal WACC are jointly estimated on consistent terms.[7] *Directly using the real WACC in the model means we have assumed that this pair of inputs is correctly matched. For example, if forecast inflation is overestimated, but this overestimate of inflation is already included in the nominal rate of return, the real WACC will still be correct. Hence, the construction of the model means we isolate changes in revenue outcomes that reflect the difference between forecast and actual inflation, not errors in the forecast inflation embedded in the WACC."*

In this statement the AER acknowledges that if expected inflation is overestimated, the real rate of return delivered in the current period (by way of the negative adjustment to the building block using expected inflation) will be too low and vice versa. In other words, if the estimate of expected inflation does not reflect market expectations of inflation built in to the nominal rate of return, the deduction from annual revenues will be too high and the network under-compensated for inflation.

Finally and by way of context, we note that, although the NER mandate the use of the PTRM, which includes a methodology for estimating expected inflation, no such requirement exists in the NGR.

NGR 73(1) requires only that service providers provide financial information on a nominal, real or some other recognised basis that deals with the effects of inflation, that the basis must be stated in the Access Arrangement Information (NGR 73(2)) and be consistent across all financial information (NGR 73(3)). This is important in the context of the recent SA Power Networks (SAPN) decision by the Australian Competition Tribunal, where the Tribunal found that the AER had not erred because under the NER, the PTRM (which specifies the AER's method for estimating expected inflation) was binding on SAPN and the AER such that the AER could not consider inflation outside of the PTRM.[8] This is not the case under the NGR.

[7] The AER's footnote 8 reads "*As noted above, this is why forecast inflation in the PTRM is a constant inflation rate with a 10 year horizon*".

[8] See: *Application by SA Power Networks [2016] ACompT 11 [553-619].*

3. The AER's Approach

CEG explain that the expected inflation input to the PTRM determines, in combination with the nominal rate of return inputs to the PTRM, a real rate of return that is delivered to the regulated entity. The AER's current methodology is to estimate the nominal rate of return inputs based on:

- nominal corporate bond yields for the cost of debt; and
- nominal government bond yields as the risk free rate used to determine the cost of equity.

The key issue is whether the AER's estimate of expected inflation which it uses in the PTRM to make a negative adjustment to the total revenue is consistent with inflation embedded in the nominal rate of return. As noted above, the nominal rate of return is derived using corporate bond yields for debt and government bond yields for equity.

It is logical that the same market data should be used to derive inflation expectations in both places. However, the AER develops a 10-year estimate of expected inflation based, not on available market information as it does for the nominal rate of return, but on a combination of the RBA's short-term estimate of expected inflation (for the first two years of the 10-year term) and the mid-point of the RBA's longer-term target range of inflation (for the past eight years).

As explained above, if the subtraction of expected inflation in the PTRM to avoid the double counting of inflation at the outset of an AA Period does not match and is inconsistent with market expectations about inflation, then the subtraction from total revenue will be too large (meaning a loss compared to market expectations) or to small (meaning a gain). It is therefore critical that the estimate of expected inflation is consistent with market expectations.

Under normal market conditions, the mid-point of the RBA target range may be a reasonable proxy of inflation expectations in the market at large. The RBA is generally considered to be a credible monetary authority able to meet its targets under normal market conditions. However, current market conditions are not normal,[9] and Australia is arguably in a "*low inflation trap*".

As CEG explain, monetary policy loses its power to lift inflation back to target levels when interest rates approach the "*zero lower bound*".[10] This is because monetary policy's most direct effect on the economy and therefore on inflation is through lower interest rates. However, the RBA cannot set a cash rate below zero (or at least not materially below zero) because at those levels, businesses and households will prefer to hold cash; delivering a zero rate of interest. It follows that the potential for monetary policy to stimulate economic activity diminishes as interest rates approach zero.

There are various pieces of evidence that Australia is presently facing this low inflation trap, including:

- RBA cash rates are at record low levels of 1.5%;[11]
- average inflation for the past two years has been 1.3%, with the June Quarter 2015 to June Quarter 2016 Consumer Price Index (CPI) being 1%;[12]

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[9] CEG, *Measuring Expected Inflation for the PTRM, section 2 and 2.1*, June 2015, provided as Supporting Information 2 and CEG, *Best Estimate of Expected Inflation*, section 5.5, 5.6 Appendix A, September 2016, provided at Attachment 9.4 to the Final Plan.

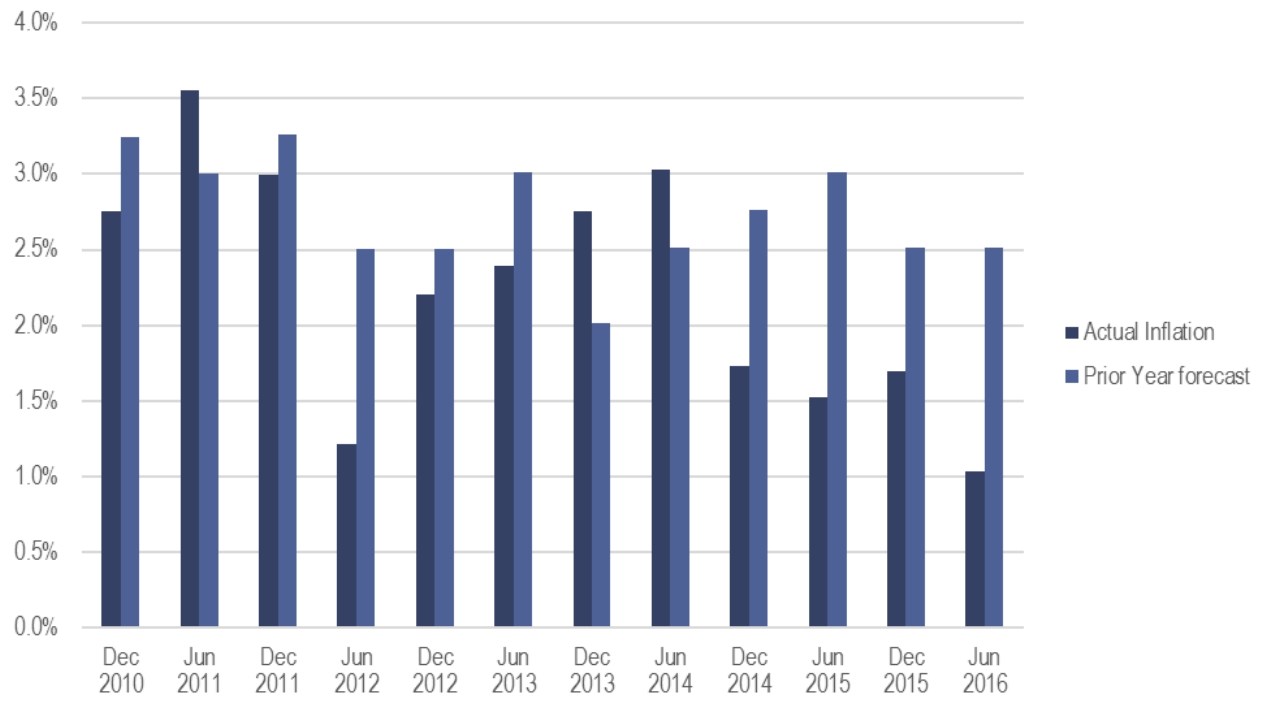
[10] Ibid.

[11] CEG, *Best Estimate of Expected Inflation*, September 2016 at [68]. Provided at Attachment 9.4 to the Final Plan.

[12] ABS, *CPI Australia*, June 2016, released 27 July 2016.

- in its May 2016 Statement of Monetary policy, the RBA reduced its short-run two-year forecast range for inflation from 2-3%, to 1.5-2.5%;[13]
  - the RBA's August and November 2016 Statement of Monetary Policy (SoMP) forecasts December 2016 CPI to be 1.5% and year ended forecast to December 2018 in the range of 1.5 to 2.5%;[14]
- break-even inflation estimates are well below AER forecasts even at a horizon of 10 years;
- the RBA itself is forecasting inflation out to December 2018 to be below the bottom of its target range out to the end of the RBA forecast horizon;[15]
- commentary from the RBA Governor and commentators that Australia faces a "*protracted*" period of "*persistent*" low inflation;[16] and
- evidence that in recent years inflation has been below target levels in all developed countries, including Australia,[17] this can be seen from the following chart.

Figure 3.1: Year Break-Even Inflation versus RBA Range[18]



Source: CEG: *Best Estimate of Expected Inflation*, September 2016, page 20. Provided at Attachment 9.4 to the Final Plan.

13 RBA, *Statement of Monetary Policy*, May 2016, table 6.1.

14 RBA, *Statement of Monetary Policy*, August 2016, table 6.1, page 67; RBA, *Statement of Monetary Policy*, November 2016, table 6.1.

15 CEG, *Best Estimate of Expected Inflation*, September 2016. Provided at Attachment 9.4 to this Final Plan.

16, CEG, *Best Estimate of Expected Inflation*, September 2016, section 5.6 and Appendix A [189]. Provided at Attachment 9.4 to this Final Plan.

17 CEG, *Measuring Expected Inflation for the PTRM*, June 2015, paragraphs 27-33. Provided as Supporting Information 2.

18 CEG, *Best Estimate of Expected Inflation*, September 2016, Figure 6, page 20. Provided at Attachment 9.4 to this Final Plan.

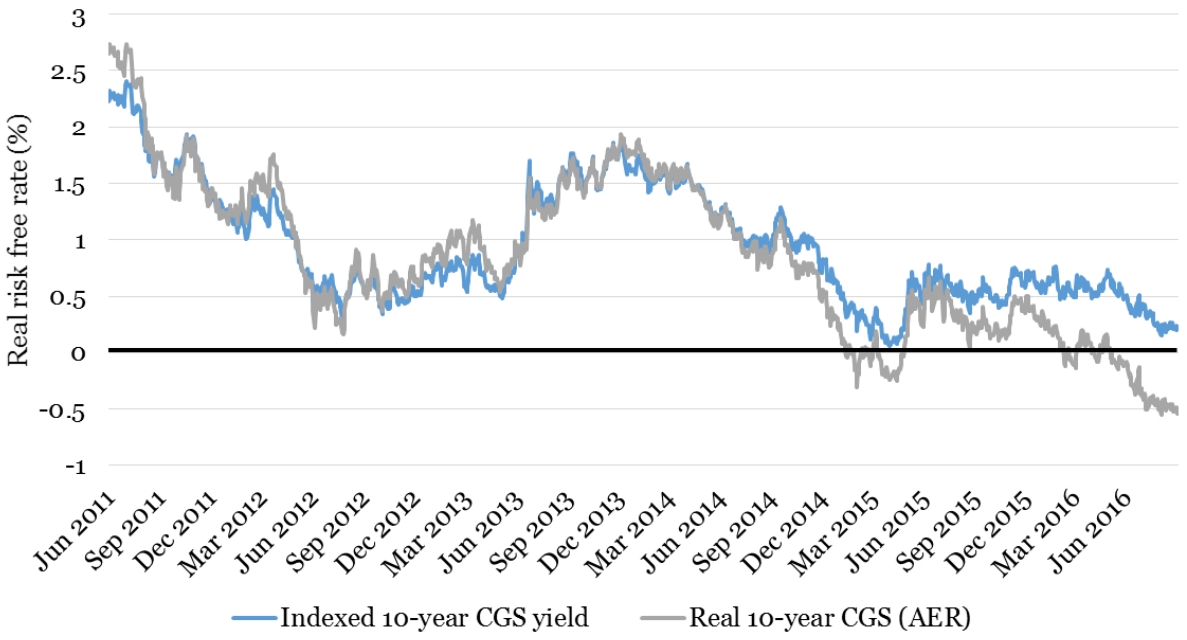
The AER acknowledges that if monetary policy loses its effectiveness to influence economic activity, inflation expectations may deviate from the mid-point of the inflation target range.[19] Given current market conditions, inflation should be expected to be below the midpoint of the RBA target range. The use of RBA's forecast and target range of future inflation at this time does not provide, at the current time, an estimate of expected inflation that matches the expectation of inflation implied in the nominal rate of return.

It must also be recalled that the AER is seeking to estimate inflation expectations during the access arrangement period, over a 10-year horizon. In this context, the actual inflation environment that persists at present and during the forthcoming averaging period is highly relevant to investors' expectations of inflation over the forthcoming 10-year term. This is explained further in the supplementary note from CEG.[20]

A key issue associated with the AER's inflation estimate in the PTRM is that, if it were to be applied consistently across a decision, it would imply a negative real interest rate on bonds, which is not consistent with the positive rates actually available on indexed bonds, and thus cannot be reflective of market expectations of inflation.

The yield on 10-year indexed CGS over the last five years is provided in the below figure extracted from the CEG report.[21] It is relevant to compare this yield with the estimated real risk free rate applying the AER's current methodology, which is to deduct its estimate of expected inflation from the yield on 10-year nominal Commonwealth Government Security (CGS).

Figure 3.2: Competing 10-year Real Risk Free Rate Estimates (Last Five Years)



Source: CEG: *Best Estimate of Expected Inflation*, September 2016, page 14. Provided at Attachment 9.4 to the Final Plan.

[19] AER, *Draft Decision AusNet Services Transmission Determination 2017-18 to 2021-22: Attachment 3 – Rate of Return*, July 2016, table 3-19, page 3-132.

[20] CEG, *Inflation Compensation – Addendum to September Report*, 14 December 2016, section 2.3. Provided at Attachment 9.5 to the Final Plan.

[21] CEG, *Best Estimate of Expected Inflation*, September 2016, section 5.1. Provided at Attachment 9.4 to the Final Plan.

It can be seen that until late 2014, the AER's methodology implied a real risk free rate that was similar to the yield on indexed CGS. However, since then the AER's estimate of the real risk free rate has fallen significantly and, at the time of CEG's analysis above, was at negative 0.5. That is, the AER's estimate implies that investors are expecting to lend to the Australian government in return for receiving less in purchasing power after 10 years than they invested originally.

Given the negative real rates implied by the AER's approach to inflation in recent times, and the inconsistency between these implied rates and positive indexed bond rates actually available in the market, we are concerned that the AER's approach in the PTRM using RBA mid-rates does not form a suitable estimate of inflation expectations for consistent use across a regulatory determination. The result of implying an over-estimated inflation expectation in one part of the decision (the PTRM) will be to deliver an expectation of under-recovery (given market expectations of inflation) of the RAB and thus an inability to recover efficient costs.

This motivates the use of a different approach to the estimation of inflation, and AGN considers that the most appropriate and consistent approach is the breakeven approach. The break-even approach produces inflation forecasts which are based on the same market data and consistent with market expectations which inform the nominal rate of return. We now turn to a discussion of this breakeven approach.

4. The Breakeven Approach

Until 2008 the AER used the break-even approach to estimate expected inflation. This approach measures inflation by reference to the difference between the yields on nominal and real Commonwealth government bonds. After 2008, the AER changed to its current method due to concerns that post the global financial crisis, a scarcity of indexed bonds meant the results from the breakeven approach were not reliable. We agree that during this time, it was appropriate to move to a different methodology.

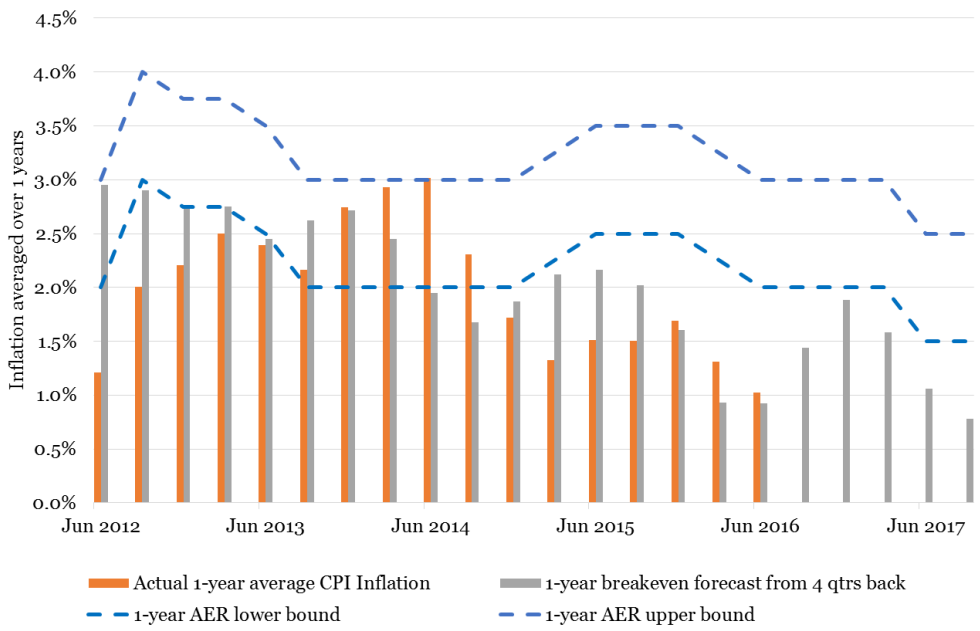
Equally, we contend that market conditions are now such that the AER's method relying (primarily) on RBA target inflation, in circumstances where current market conditions hamper the effectiveness of monetary policy to achieve those targets, does not represent an appropriate estimate of expected inflation and there should be a change in approach.

As noted above, it is bond investors' expectations of inflation which are relevant and break-even inflation provides a measure of those expectations. This section explains the basis for estimating expected inflation using the break-even approach.

If the break-even approach was a very poor predictor of expected inflation, then this ought to give pause before considering it further; particularly if it were markedly worse as a forecast compared with the RBA target band approach. However, CEG's report demonstrates that since 2011, break-even inflation estimates have accurately predicted actual inflation.

CEG show that using a one-year, two-year and three-year break-even inflation rate, break-even inflation rates have typically performed best.[22]

Figure 4.1: One-year Break-Even Inflation versus RBA Range

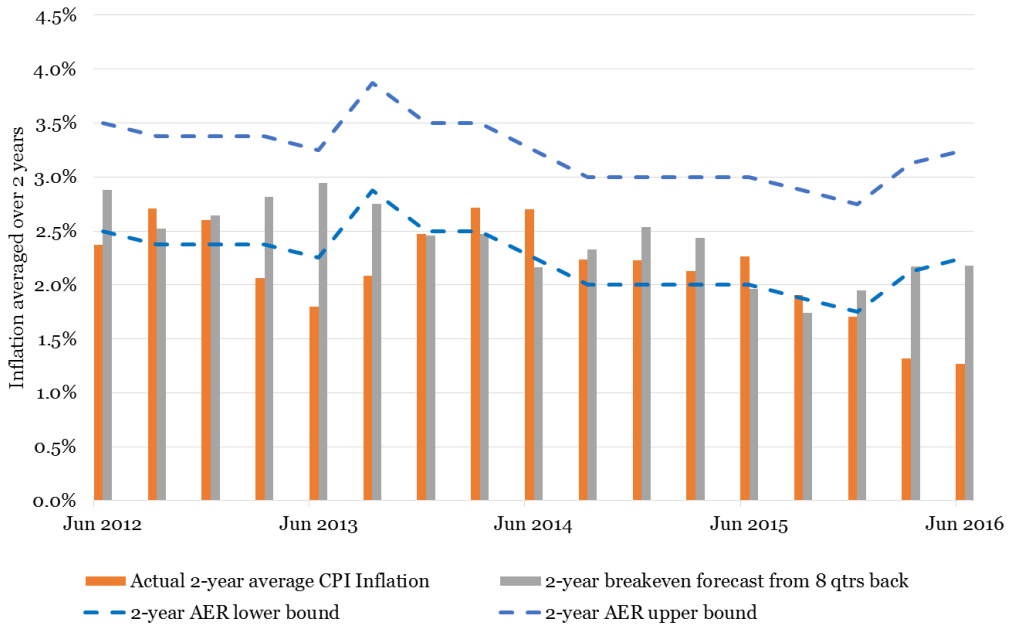


Source: CEG: *Best Estimate of Expected Inflation*, September 2016, page 19. Provided at Attachment 9.4 to the Final Plan.

[22] CEG: *Best Estimate of Expected Inflation*, September 2016, section 5.3. Provided at Attachment 9.4 to the Final Plan.

A similar story exists using two-year inflation estimates. Once more, break-even inflation has performed materially better than the mid-point of the RBA range for the most recent years.

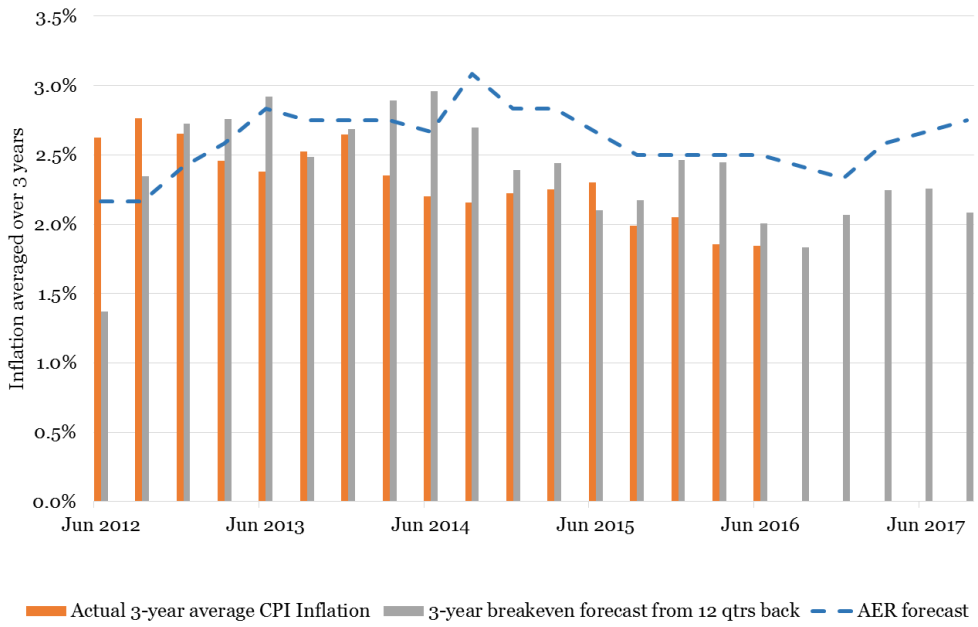
Figure 4.2: Two-year Break-Even Inflation versus RBA Range



Source: CEG: *Best Estimate of Expected Inflation*, September 2016, page 21. Provided at Attachment 9.4 to the Final Plan.

The same can be seen from the three-year inflation estimates.

Figure 4.3: Three-year Break-Even Inflation versus RBA Range

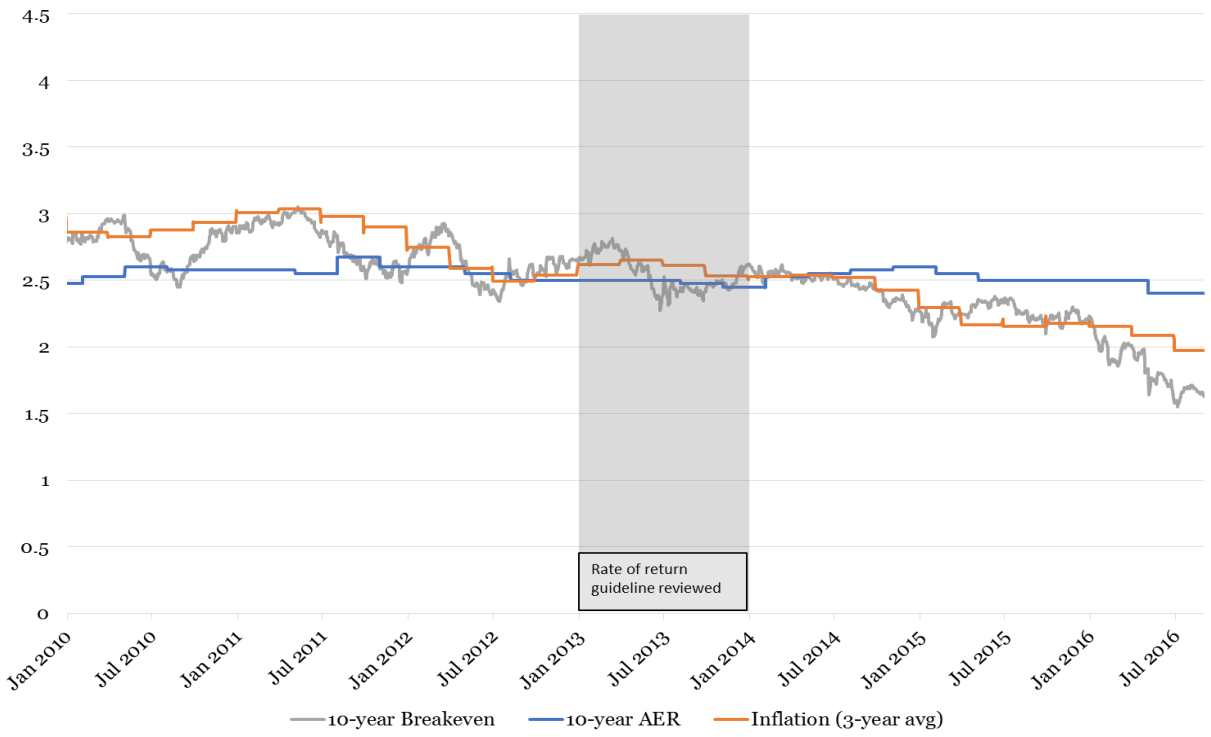


Source: CEG: *Best Estimate of Expected Inflation*, September 2016, page 22. Provided at Attachment 9.4 to the Final Plan.

The breakeven approach also meets the AER's requirement of flexibility and allowing market conditions to be reflected in regulatory outcomes.[23] Again, it arguably performs better than the RBA target-band approach in this respect.

CEG has shown in the following chart that break-even inflation has responded quickly to actual inflation falling well below RBA targets from late 2015.[24]

Figure 4.4: Break-Even Inflation versus AER Inflation (10 years) versus Actual Inflation (1 year) Less 2.5%



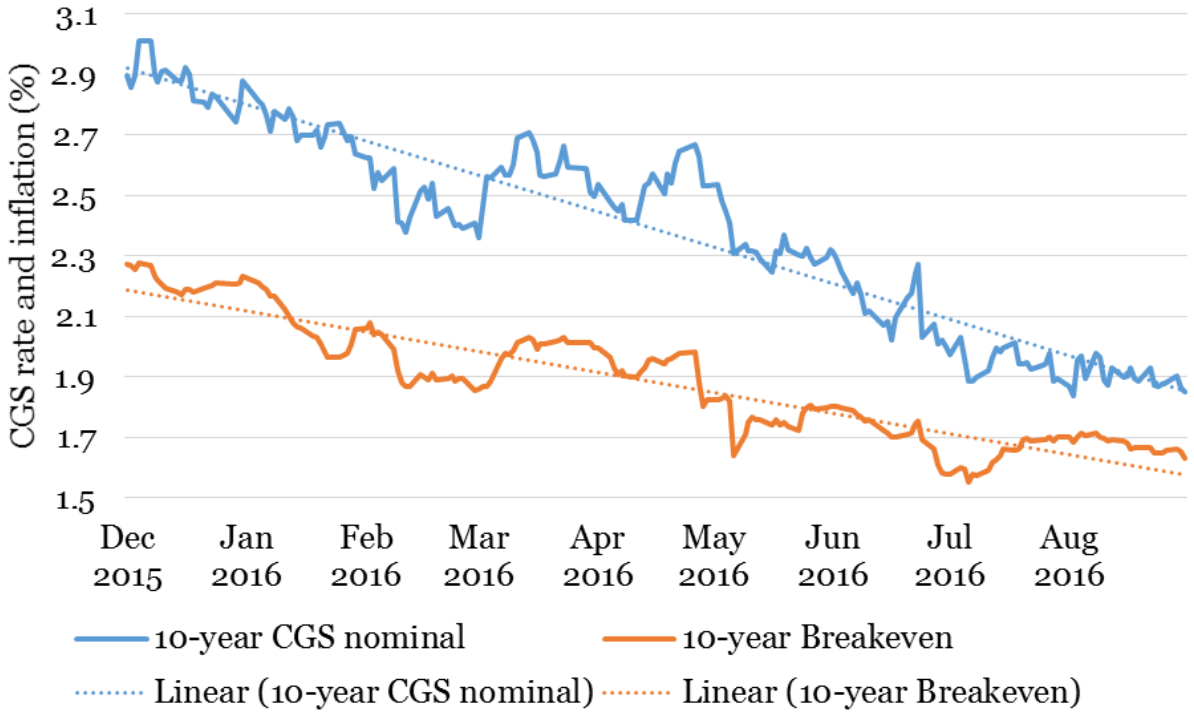
Source: CEG: *Best Estimate of Expected Inflation*, September 2016, page 16. Provided at Attachment 9.4 to the Final Plan.

Further, CEG's expert opinion is that falls in CGS yields over the previous 12 months have been associated with a similar fall in inflation expectations, rather than falls in real yields. This can be seen from Figure 4.5 which shows nominal CGS yields and 10-year breakeven inflation.

[23] AER, *Rate of Return Guidelines*, December 2013, page 6.

[24] CEG, *Best Estimate of Expected Inflation*, September 2016, section 5.2. Provided at Attachment 9.4 to the Final Plan.

Figure 4.4: 10-year Nominal CGS Rates and 10-year Breakeven Inflation



Source: CEG: *Best Estimate of Expected Inflation*, September 2016, page 29. Provided at Attachment 9.4 to the Final Plan.

If inflation is assumed to have remained constant around 2.5% over the December 2015 to August 2016 period, this would imply that real CGS yields have fallen by the same magnitude as nominal CGS yields and that relative yields have in fact become negative.[25]

CEG conclude that, based on its analysis, the AER's estimate of inflation has not responded to the changing inflation environment and leads to an overestimate of expected inflation.[26] The CEG report establishes that break-even estimates of inflation have better predicted actual inflation than an estimate relying on RBA forecast and target ranges. We submit that the break-even approach will better estimate inflation expectations of investors, which is required for the PTRM to operate as intended.

4.1. Issues the AER has Identified with the Break-Even Approach

The AER says that the size and liquidity of the indexed CGS is still limited and that increased absolute liquidity in the indexed CGS market does not necessarily imply that the market has become more liquid relative to the nominal CGS market.[27]

However, it is noted that the smaller size (short supply) of the indexed CGS market was previously attributed as a reason for break-even inflation overstating expected inflation (not understating it).

[25] CEG, *Best Estimate of Expected Inflation*, September 2016, section 5.7. Provided at Attachment 9.4 to the Final Plan.

[26] CEG, *Best Estimate of Expected Inflation*, September 2016, section 5.8. Provided at Attachment 9.4 to the Final Plan.

[27] AER, *Draft Decision, AusNet Services,* at 3-136.

If these 'distortions' still exist then they imply that the actual expected inflation is even lower than the break-even rate.[28]

The AER states that the size and liquidity of the indexed CGS market is still limited referencing a Treasury paper from 2012. The AER references page 7 where the following quote can be found:

> *"The use of bond market break-evens is also made somewhat problematic by the limited size and liquidity of the indexed bond market in Australia."*

However, this quote was directed to the historical data being used in the paper – not necessarily to the data at the time of writing.

In addition, since 2012 there has been significant new issues of indexed CGS. For example, the Treasury paper states:

> *"In late 2009, however, the AOFM resumed its indexed bond issuance program and the market has since grown to just over $16 billion outstanding. There are currently five indexed bond lines on issue, with maturities ranging from 2015 to 2030."*

The growth in the indexed CGS outstanding has continued further, with the current size of the market at $31 billion. Also, the turnover of the indexed CGS market has also increased from $11 billion in 2007-08 to $51 billion in 2014-15. These statistics, along with other analysis of availability data, has led PwC to find:

> *"…that Indexed CGS are sufficiently "liquid" for their pricing to be reliable input to the Breakeven model"*[29]

The AER states "*Liquidity bias can be material and difficult to identify and remove from the breakeven rate—particularly as evidence indicates that it can vary considerably over time.*" However, of the two papers that the AER cites one is from 2001 – when the Treasury Inflation-Protected Securities (TIPS), indexed CGS) market was in its infancy (a period when all of the rest of the AER's cited articles agrees that there was a newness/strangeness/liquidity premium) and the other paper similarly covers the period 1999 to 2008 which include the infancy of the indexed bond market and the Global Financial Crisis (GFC).

Further, in respect of liquidity bias PwC observed:

> *"…do not believe a liquidity bias needs to be removed from the pricing of Indexed CGS. We hold this view for the reason that Nominal CGS are not a substitute for Indexed CGS. Investors do not hold Nominal CGS rather than Indexed CGS for the reason that the former are liquid as a "liquidity preference".*[30]

In relation to CPI swaps as an estimate of expected inflation, Appendix B to the CEG report shows that this measure will tend to be biased upwards to account for risk premiums and capital costs for the banks providing these products. Consistent with that, inflation swap estimates of expected inflation remain above break-even estimates and we consider them not to be an appropriate basis on which to estimate forecast inflation.

Secondly, the AER has raised concerns in respect of four potential aspects of bias in the breakeven approach. The AER relies upon a number of articles in support of its position. CEG has undertaken a review of the literature relied upon by the AER as well as papers not cited by the AER. CEG's literature review shows an overwhelming conclusion that there is no evidence to suggest the

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[28] CEG, *Best Estimate of Expected Inflation*, September 2016, at [105]-[106]. Provided at Attachment 9.4 to the Final Plan.

[29] PwC, *Estimating Expected Inflation using the Breakeven Method*, December 2016, pg4. Provided at Attachment 9.3 to the Final Plan

[30] PwC, *Estimating Expected Inflation using the Breakeven Method*, December 2016, pg4. Provided at Attachment 9.3 to the Final Plan

potential bias in the breakeven methodology currently exist or that if they exist, they would result in an underestimate of inflation.[31]

CEG's opinion however is that the evidence in the literature is that any bias is likely to be positive such that breakeven inflation overstates expected inflation. In relation to the specific bias referred to by the AER

- *Convexity Bias* – this is said to exist because of two phenomena. Firstly, it is said that nominal security (bond) yields are more volatile than indexed bond yields, and therefore the difference between the two is not purely the inflation expectation of holders. [32] Secondly, it is said that bond investors are more sensitive to reductions in yield than to increases in yield. Therefore, it is argued, there is a bias which tends to raise nominal bond prices (and so depress their yields), relative to indexed bond prices, narrowing the spread in yields between them and so tending to underestimate the inflation estimate produced by the break-even / methodology. The source the AER cites in support of this potential bias is not an empirical study. It is noted that the study is a brief, high-level Bank of England Quarterly article from 2002 (Scholtes 2002) which does not appear to identify data on which the convexity bias theory might be based and does not estimate the impact of the convexity bias.[33] CEG note that Grishchenko and Huang (2012) cite literature that puts this bias at less than -1bp.[34]
- *Inflation Risk Premium Bias* – the AER note this generally results in an overestimate of inflation rather than an underestimate. This is confirmed by CEG's review of the Grishchenko and Huang (2012) paper cited by the AER.[35]
- *Liquidity Premium Bias* – this is said to exist because nominal bonds have a premium in them for liquidity essentially arising from the fact that indexed bonds are relatively less liquid. The AER contends therefore that the difference between nominal and indexed bonds is not purely based on inflationary expectation.[36] The AER relies on Shen and Corning [2001].[37] It is noted that CEG consider that article provides little support for the position.
- *Inflation Indexation Lag Bias* – this is said to potentially be an underestimate or overestimate and it is potentially small.

Only the convexity and liquidity premium issues are said to result in a potential downward bias of expected inflation forecasts. CEG's review of the literature however indicates that breakeven inflation is more likely to overestimate expected inflation than under estimate it.[38]

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31 CEG, *Best Estimate of Expected Inflation*, September 2016, Section 6, provided at Attachment 9.4 to the Final Plan. CEG, *Inflation Compensation – Addendum to September Report*, 14 December 2016, section 1, in particular 1.1 and 1.6, provided at Attachment 9.5 to the Final Plan.

32 See the AER's explanation in AER, *Draft Decision AusNet Services Transmission Determination 2017-18 to 2021-22: Attachment 3 – Rate of Return*, July 2016, Table 3-20 at 3-155.

33 Scholtes, C., *On Market-Based Measures of Inflation Expectations*, Bank of England Quarterly Bulletin, Spring 2002, page 71, CEG, 6.1.3.

34 CEG, *Inflation Compensation – Addendum to September Report*, 14 December 2016, section 1 and Appendix B. Provided at Attachment 9.5 to the Final Plan

35 CEG, *Best Estimate of Expected Inflation*, September 2016, Section 6.2.4, provided at Attachment 9.4 to the Final Plan. CEG, *Inflation Compensation – Addendum to September Report*, 14 December 2016, section 1 and Appendix B, provided at Attachment 9.5 to the Final Plan.

36 See the AER's explanation in AER, D*raft Decision AusNet Services Transmission Determination 2017-18 to 2021-22: Attachment 3 – Rate of Return*, July 2016, Table 3-20 at 3-133.

37 CEG, *Best Estimate of Expected Inflation*, September 2016, Section 6.2.5. Provided at Attachment 9.4 to the Final Plan.

38 Ibid, Section 6.3. Provided at Attachment 9.4 to the Final Plan.

As CEG also point out, in regulatory decisions made prior to late 2008, no adjustments for any perceived bias when using the breakeven approach to estimate expected inflation were made.[39] When adjustments were later made the estimate of expected inflation used was lower than breakeven inflation. That is, consistent with adjusting for an upward bias.[40] CEG also explain that the existence of positive bias is confirmed by the existence of CPI indexed bonds.[41]

[39] CEG, *Inflation Compensation – Addendum to September Report*, 14 December 2016, Section 1.2. Provided at Attachment 9.5 to the Final Plan.

[40] Ibid, Section 1.3.

[41] Ibid, Section 1.5.

5. Summary

We remain concerned that the AER's methodology for estimating expected 10-year inflation results in an estimate which is inconsistent with investors' inflation expectations as reflected in the nominal rate of return.

As CEG's report shows, while in normal market conditions the mid-point of the RBA target range may be a reasonable proxy of inflation expectations, in current circumstances, including the low inflation trap environment, the RBA's targets do not accurately represent investor expectations of inflation.

For the reasons explained above, it is necessary for the estimate of expected inflation to be consistent with the inflation expectations captured in the nominal rate of return. The best way to obtain an accurate and consistent estimate is to use the same market data used to derive the nominal rate of return, as is the case with the break-even approach.

The CEG and PwC reports we have provided respond to the AER's concerns with the breakeven approach, including in relation to the concerns about the liquidity of the indexed bond market.

Based upon the considerations above, we consider that breakeven inflation is the best direct and consistent measure of inflation expectations in the market currently available and gives rise to the best estimate of expected inflation possible in the circumstances. Based upon our indicative averaging period of September 2016 (to be updated for the Final Decision) this gives a 10-year inflation estimate of around 1.6 percent.

However, as noted above, we have applied the AER approach giving rise to an estimate of 2.39% in this Final Plan pending the outcome of further engagement with the AER and stakeholders on this important matter, including through the AER's review of its approach to estimating expected inflation.

5.1. Potential Alternative Approaches

As noted in our Final Plan, stakeholders at our workshop on the Draft Plan were keen to ensure that the regulatory model does not provide windfall gains or losses to either AGN or its customers. This led to suggestions on how the regulatory regime could provide for a true-up between actual and forecast inflation. Suggestions put forward at the workshop included not adjusting the capital base for actual inflation and forecasting inflation over a five-year period and not a 10-year period.

Our primary concern is to ensure that the best estimate of expected inflation is used to determine our allowed revenue (and prices). We do however consider that there is also merit in exploring alternate approaches for dealing with inflation, including those options suggested by stakeholders.

The AER has expressed the view that it is preferable to consider the methodology for estimating expected inflation by way of an industrywide review rather than on a decision-by decision basis.[42] On 15 December 2016 the AER announced a review of its current method for estimating expected inflation to commence in early 2017. We support a review of the AER's approach to estimating inflation as identified in its PTRM given the current level of uncertainty and the difficulties with relying on the RBA target ranges in current market conditions.

Set out in the box below are some alternative approaches that could be considered further by the AER and stakeholders in the review of the issue. In presenting these alternatives, we do not

[42] See for example AusNet Services *Transmission Determination Draft Decision Attachment 3 Rate of Return*, page 3-137.

submit that any of them are a better alternative to the break-even approach or that they do not suffer from limitations. Rather, Box 5.1 is presented to advance the AER's and stakeholders' consideration of this complex issue. CEG also raise some potentially important issues in terms of how the regulatory regime compensations for deviations between actual inflation and expected inflation at the time of a regulatory determination which should also be considered further.[43]

Box 5.1: Potential Alternative Approaches to Inflation

Updating the Estimate of Expected Inflation in the PTRM each year for actual inflation – This would involve replacing the estimate of expected inflation in each year of the access arrangement period with the actual CPI (out-turn inflation) for the relevant year. For example, at the same time the return on debt is updated each year. We understand that this alternative approach has already been proposed by APA Group in respect of its Roma to Brisbane Access Arrangement Proposal.

Rolling forward the regulatory asset base in the roll forward model using the same estimate of expected inflation instead of actual inflation – this would prevent the current mismatch that applies when the estimate of expected inflation used in the PTRM differs from actual inflation used to roll forward the RAB. Under the NGR there is no limitation to such an approach being used in the roll forward model.

Derive nominal rate of return by estimating the real rate of return directly and adding AER inflation estimate-this alternative approach was proposed (as an alternative) by AusNet Services transmission in its Revised Regulatory Proposal submitted in September 2016 and a worked example is included in section 7 of the CEG report attached *Best estimate of expected inflation,* September 2016.

Annual update of the AER's methodology a further (less desirable than market based approaches) alternative may be for the AER to update its own estimates of expected inflation using RBA short term inflation forecasts for each year of the regulatory period as they become available, rather than relying on the long term RBA target bands. That is, at the same time that the return on debt is updated each year, the RBA's latest statement of monetary policy short term forecasts of inflation for the relevant year would replace in the PTRM the RBA target number used in the 10-year term.

As noted above, none of these approaches are necessarily perfect but AGN encourages the AER to explore and consult on alternative methods.

[43] CEG, *Inflation Compensation – Addendum to September Report*, 14 December 2016, section 2. Provided at Attachment 9.5 to the Final Plan.