Draft position

Regulatory treatment of inflation

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AUSTRALIAN ENERGY REGULATOR

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Contents

Shortened forms

Shortened form	Extended form
AEMC	Australian Energy Market Commission
AER	Australian Energy Regulator
BBIR	Bond break-even inflation rate
CGS	Commonwealth Government Securities, also known as Australian Government Securities
CPI	Consumer Price Index
Energy networks	Refers to a network through which a service provider provides electricity network services and/or gas pipeline services.
NEO	National Electricity Objective
NER or rules	National Electricity Rules
Network services	Refers to electricity distribution, electricity transmission, and/or gas pipeline services.
NGO	National Gas Objective
NGR or rules	National Gas Rules
NPV	Net present value
PTRM	post-tax revenue model
RAB	Refers to the regulated asset base for electricity service providers as prescribed in the National Electricity Rules, or a capital base for gas service providers as prescribed in the National Gas Rules.
RBA	Reserve Bank of Australia
Regulatory period	Refers to a regulatory period (for electricity service providers) and/or an access arrangement period (for gas service providers).
Regulatory proposal	Refers to a regulatory proposal, revised regulatory proposal, revenue proposal, revised revenue proposal, access agreement proposal, or revised access arrangement proposal.
RFM	roll-forward model

1 Draft position

It is our role to ***determine a method that is likely to result in the best estimate of expected inflation*** (emphasis added).[1] We are proposing to change our approach to estimating expected inflation.

Inflation is the term for the changing purchasing power of a dollar. If the rate of inflation is high, a dollar purchases fewer goods and services today than in the recent past. In other words, inflation reduces the purchasing power of the dollar.

There are many factors that might cause inflation such as changes in fuel prices, changes in exchange rates or the natural progression of wage growth. We need to account for inflation in our decisions so that service providers can recover the efficient cost of their investment over the life of the assets.

Our current approach to estimating expected inflation uses a 10 year average of the Reserve Bank of Australia's (RBA) headline rate forecasts for 1 and 2 year ahead, and the mid-point of the RBA's target band—2.5 per cent—for years 3 to 10. While our current approach remains fundamentally sound, we consider it may be improved by:

- Shortening the target inflation horizon from ten years to a term that matches the length of a regulatory period (typically five years).
- Applying a linear glide-path from the RBA's forecasts of inflation for years 1 and 2 to the mid-point of the inflation target band (2.5 per cent) in year 5.

We consider this method is likely to result in the best estimate of expected inflation. In particular, our approach is clearly superior to market-based measures including the bond break-even, surveys and swaps approaches. The reasons for our draft positions are set out in chapters 10 to 13.

We are seeking stakeholder views on whether we should defer (or phase-in) the move to a shorter term of 5 years (see chapter 15).

As part of this review, we have also reconsidered whether the regulatory framework delivers a real rate of return. We are satisfied that it does deliver a real rate of return as intended under the rules.

We have also considered options to change the regulatory framework to target either a nominal or hybrid rate of return. We are not persuaded that either option is preferable to our draft position based on the evidence before us. Further, we consider our proposed change to our estimation method addresses the key issues that have motivated submissions to change to a hybrid or nominal framework. We consider these issues in chapter 16.

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[1] NER, cll. 6.4.2(b)(1), 6A.5.3(b)(1); NGR, r. 75B.

2 Why is inflation important in the regulatory framework?

The general inflation rate is applicable across the economy, and it plays a role in determining the amount of money we allow regulated electricity and gas network service providers (service providers) to recover from their consumers and therefore the prices consumers pay. Our current approach to regulation provides a price/revenue path that is linked to inflation, referred to as a 'real' rate of return.[2]

This real approach has been employed by numerous regulators over many years.[3] In our case it was established in rules developed by the Australian Energy Market Commission (AEMC) in 2006.[4] Since 2006, the framework has successfully supported the provision of network services to consumers.

Under our real approach we set the revenue that service providers can recover from consumers in the first year of the regulatory period (typically five years), and then for the remaining four years we adjust the revenue allowance to include movements in actual inflation. As part of this framework, we also escalate the regulated asset base (RAB) by movements in actual inflation. This approach means that the value of investments in network infrastructure move in line with actual inflation. As a result we also use a real rate or return (i.e. the rate of return net of inflation).

An alternative approach is a nominal framework where values are set at the start of the regulatory period and not adjusted for movements in inflation but the rate of return used includes inflation.

2.1 How do we use inflation in our decisions?

As noted above, under the current regulatory framework, we determine a total revenue requirement for each service provider for its regulatory period (typically five years). The total revenue is determined based on a range of building block components including operating expenditure (opex), tax, depreciation of the RAB and a return on the investment in the RAB.

When we calculate the return on the investment in the RAB, we do so looking forward across the upcoming regulatory period. Effectively we ask:

- What return do investors expect to encourage them to invest their capital in energy networks?

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2 Information on a real or nominal return is set out in section 8.2.1. Alternatively, our discussion paper contains detailed discussion on real and nominal.

3 Early international examples are Chile and the UK (e.g. regulation of electricity and water by Ofgem and Ofwat), who separately initiated CPI-X regulation using revalued or indexed asset bases. Since then it has been widely adopted in many countries.

- As part of this exercise, we also ask what do investors expect will happen to inflation?

To answer these questions we need to develop a method to estimate expected inflation.

We then smooth the revenue requirement to remove year to year variations and determine a starting revenue in year one of the regulatory period.

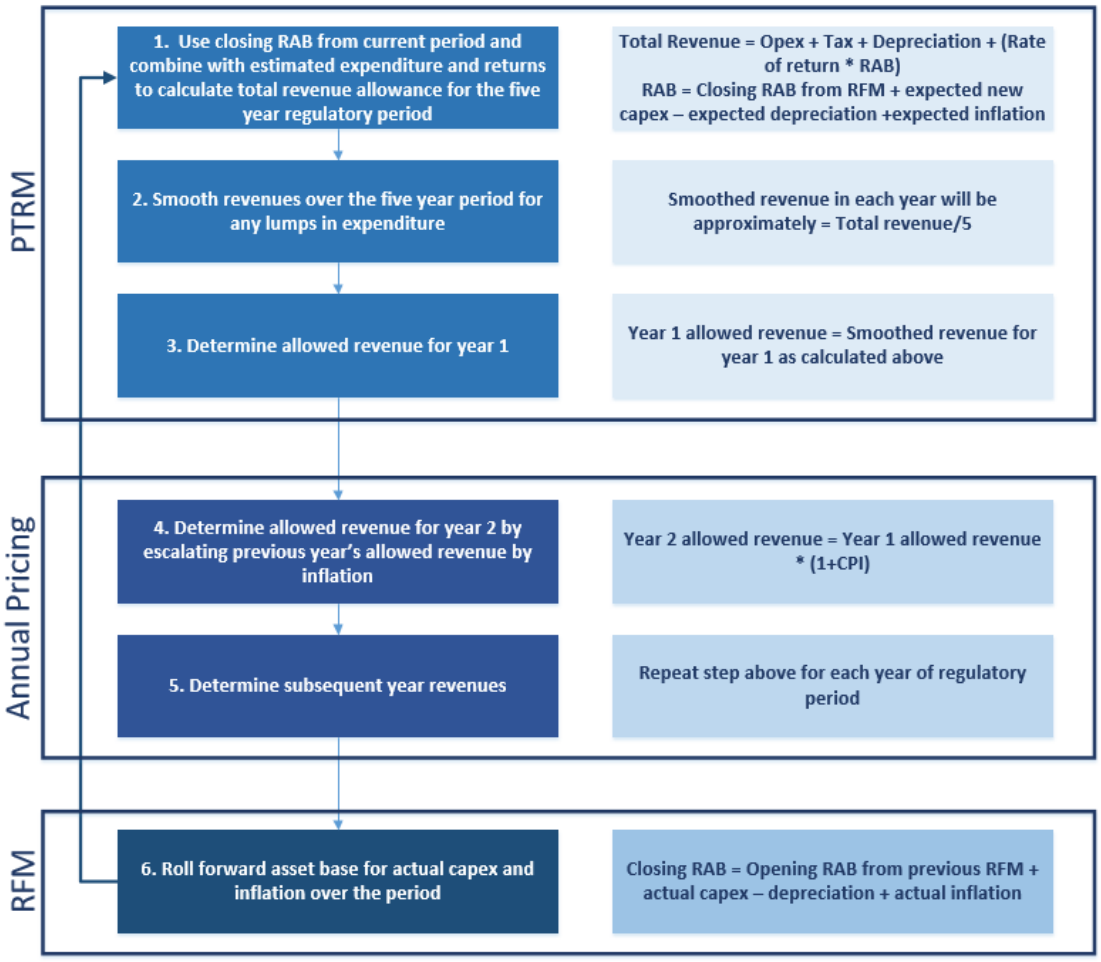
Once we have the starting revenue in year one, we do not use the building block revenue for the regulatory period again. Instead, we escalate the year one total revenue by a consumer price index or CPI-X formula in each subsequent year. The CPI number we use is actual CPI as measured by the Australian Bureau of Statistics and is the measure of actual inflation. The X factor represents the rate of change in $real required revenue each year to recover total building block costs over the regulatory period.

Updating revenues for actual inflation means the purchasing power of the revenue stream is preserved over the regulatory period for both consumers and service providers. The prices that consumers pay vary year to year depending on the value of actual inflation (CPI). This means that prices for electricity and gas services vary in line with the price of other goods in the economy, and more generally movements in incomes.

We also preserve the purchasing power of the investment in the RAB across regulatory periods by escalating the RAB by movements in actual inflation, (although we do this at the end of the regulatory period, rather than year by year).

Figure 1 presents a simplified example to illustrate the operation of the current regulatory framework.

Figure 1 Simplified example of the current regulatory framework operation



The net effect of the framework set by the NER/NGR is:

- Service providers are compensated for movement in inflation because we index the RAB for actual inflation.
- Therefore, service providers receive the ex-ante real return on assets we set in our regulatory determinations.
- Service providers may receive (ex-post) a nominal return above or below the ex-ante nominal return set in the binding rate of return instrument, depending on inflation outcomes.

3 What do the rules say about how we should use inflation?

The National Energy Rules (NER) and National Gas Rules (NGR) provide the framework for how inflation should be reflected in our regulatory decisions.

Under the NER, we are required to publish a post-tax revenue model (PTRM) for electricity service providers.[5] Similarly for gas service providers, under the NGR, we are required to publish a revenue model.[6] All service providers must prepare their revenue proposals in accordance with the PTRM or revenue model.[7] The inflation estimation method is a mandatory part of the PTRM under the NER, and the revenue model under the NGR.

The PTRM is used to convert a nominal rate of return on assets to an initial real rate of return when we make a regulatory determination by:

- Setting an allowed nominal rate of return under the binding rate of return instrument.
- Applying the method specified in our PTRM that we determine is likely to result in the 'best estimates' of expected inflation. The estimate is used to reduce the allowed nominal rate of return to a real rate of return.
- Applying this real rate of return to the service provider's RAB.[8] Increasing the service provider's RAB from year to year over the regulatory period by CPI.

To give effect to this framework, the rules require us to determine a method that is likely to result in the best estimates of expected inflation.

Appendix A provides a commentary on relevant NER and NGR requirements.

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5 NER, cll. 6.4.1 and 6A.5.2.

6 NGR, r. 75A.

7 NER, cll. 6.3.1(c)(1) and 6A.4.1(b)(1) and NGR, rr. 72(3) and 73(3).

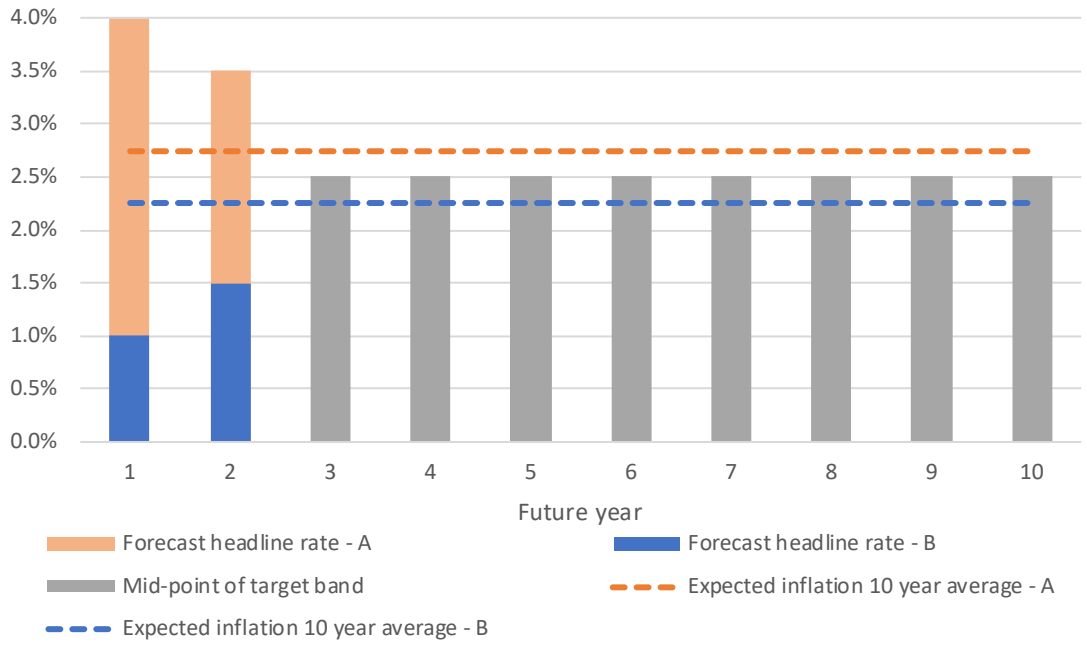
8 See e.g. NER, cll. 6.4.3(b)(1)(ii) and 6A.5.4(b)(1)(ii).

4 How do we currently estimate expected inflation?

- Our current approach to estimate expected inflation uses a 10 year average[9] of the:
  - RBA's forecast headline rate for 1 and 2 years ahead, then
  - mid-point (2.5 per cent) of the RBA's target inflation band of 2 to 3 per cent for years 3 to 10.

Figure 2 shows the 10 year average expected inflation estimate under two different forecasts for short-term headline inflation.

Figure 2 Estimate of expected inflation using two different headline forecasts



We consider this approach is transparent and can be replicated easily by stakeholders. Submissions from the Consumer Reference Group (CRG),[10] Energy Consumers Australia,[11] Major Energy Consumers,[12] Energy Users Association of Australia[13] and the Public Interest Advocacy Centre[14] supported the retention of our current approach. Deloitte Access Economics (Deloitte) also found that our current approach remained

[9] Specifically, a 10 year geometrically annualised average.

[10] CRG, *Submission to discussion paper, 2020 inflation review*, July 2020, p. 32.

[11] Energy Consumers Australia, *Submission to discussion paper, 2020 inflation review*, July 2020, p. 1.

[12] Major Energy Consumers, *Submission to discussion paper, 2020 inflation review*, July 2020, p. 1.

[13] Energy Users Association of Australia, *Submission to discussion paper, 2020 inflation review*, July 2020, p. 1.

[14] Public Interest Advocacy Centre, *Submission to discussion paper, 2020 inflation review*, July 2020, p. 1.

suitable.[15] While the method has some dependencies, (such as the reliance on the anchoring of long-term expectations—discussed in chapters 10 and 11), we will continue our monitoring program adopted following our 2017 review as noted in chapter 5.

4.1 Expectations, forecasts and outcomes

It is very important to distinguish between expectations, forecasts and outcomes. In a number of submissions, some stakeholders have mixed these concepts and have therefore drawn incorrect conclusions.

We interpret expected inflation to mean investors' expected value of actual inflation over the relevant period (currently in our case, over ten years). This is investors' expectations at the point in time when we make our regulatory decision. The expected value of inflation is informed by forecasts of inflation, but typically forecasts do not span the entire regulatory period. Investors therefore need to draw on other information beyond the available forecasts to form their expectations.

Both expectations and forecasts are an ex-ante concept. That is, they are made in advance of the actual outcome. The outcome could be lower, the same, or higher.

Importantly, outturn inflation being higher or lower than expected inflation does not mean the estimate of expected inflation was incorrect when it was made. It also does not mean a service provider was incorrectly compensated for inflation. Under our regulatory framework, service providers receive a target real return plus actual inflation. As long as the estimated expectation used to set the real return on assets was unbiased (in the sense that it reflects investors' expectations) at the time the real rate of return target was set, service providers are correctly compensated irrespective of actual inflation outcomes.[16]

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15 Deloitte Access Economics, *Review of the regulatory treatment of inflation*, 30 June 2020, p. 38.

16 In the sense that the service provider can earn the ex-ante real return on assets.

5 Why have we undertaken this review?

We last ran a comprehensive review of the regulatory treatment of inflation in 2017. Our final position of that review was that we would maintain our existing approach.

We also indicated that we would continue to monitor inflation related data, in particular through the Consensus Economics (CE) survey of long-term inflation expectations.[17] Our ongoing monitoring to early 2020 indicated broadly consistent observations in the key information we relied on in 2017.

In early 2020 we observed some movements across the spectrum of data and information we examine. While no individual piece of evidence was determinative, when considered in aggregate these movements supported the commencement of the 2020 review.

Whilst not an exhaustive list, some of the recent changes included:

- Data from Consensus Economics' surveys showing a slower transition over years 3 to 5 back to the mid-point of the target band,
- Inflation outcomes that have been below the mid-point of the RBA's target band for an extended period. Also forecasts of inflation from the RBA for the next 2.5 years in its February 2020 SMP were lower than previously,
- Statements from the RBA including:

> …the global outbreak in coronavirus is expected to delay progress in Australia towards full inflation and the inflation target.[18]

The method for estimating expected inflation was also raised at stakeholder engagement sessions in late 2019 and had been the subject of debate in regulatory determinations.[19] The concerns raised with us centred on whether our approach continues to deliver the best outcomes where actual inflation is low and has remained so for an extended period.[20] We outline our ongoing stakeholder engagement below.

Subsequent to our decision to initiate this review, COVID-19 has had significant economic and broader impacts. These impacts are separate to those which led us to initiate this review.

5.1 Stakeholder engagement since September 2019

On 5 September 2019, we held a working group on 'expected inflation and low Commonwealth Government Securities' yields.' This was an AER staff led meeting

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17 AER, *Regulatory treatment of inflation, Final position*, December 2017, p. 48.

18 RBA, *Statement by Philip Lowe, Governor: Monetary Policy Decision*, 3 March 2020.

19 See AER website: https://www.aer.gov.au/networks-pipelines/guidelines-schemes-models-reviews/review-of-expected-inflation-2017/updates

20 See AER website: https://www.aer.gov.au/networks-pipelines/guidelines-schemes-models-reviews/review-of-expected-inflation-2017/updates

attended by a cross-section of stakeholder representatives (service providers, consumer representatives, investors and retailers). In the working group meeting, the Energy Networks Association (ENA) raised concerns about our approach to inflation, including that actual inflation has been lower than recent RBA forecasts.

On 20 September 2019, SA Power Networks wrote to us requesting that we open a new review into our method for estimating expected inflation. Jemena Gas Networks (JGN) also wrote to us requesting that the gas financial model development process include consultation on how an estimate of expected inflation is applied.

We reviewed SA Power Networks' letter and considered the most recent data on inflation expectations available. We considered that the working group was the most appropriate forum to continue exploring the issues raised by SA Power Networks. We wrote to SA Power Networks on 7 November 2019 to inform them of our approach.

On 11 November 2019, we received a second letter from SA Power Networks regarding its concern with our approach to inflation. In this letter, SA Power Networks quoted commentary made by the RBA around expected inflation. SA Power Networks stated that the remarks made by the RBA indicated that long-term inflation expectations had changed – unanchored from the RBA's mid-point of 2.5 per cent. However, when the RBA commentary was considered in full, we found that there was no indication that the RBA was stating that long-term expectations had become unanchored.

On 28 November 2019, we held a second working group meeting. We discussed our response to the September inflation material. There was also initial discussions on further ENA material from early November. Following that meeting, Queensland Treasury Corporation (QTC) submitted a further note on a number of matters it raised during the meeting.

In December 2019, SA Power Networks, Ergon Energy and Energex submitted their revised regulatory proposals for the 2020–25 regulatory period. In their revised regulatory proposals, they all adopted our current method for estimating expected inflation, but raised a number of concerns with our approach. SA Power Networks expanded on its previously raised concerns in its revised proposal.

In early March 2020, we received two further letters from SA Power Networks and JGN regarding a review of inflation. SA Power Networks' letter contained similar concerns on inflation as its revised regulatory proposal, but incorporated more recent data and statements from the RBA. JGN's inflation concerns were similar to those it raised in the gas financial model development process.

Further, SA Power Networks stated that we should reconsider our inflation approach in light of 'the outbreak of coronavirus and the effect of this on global financial markets'.[21]

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[21] SA Power Networks, *Letter re: SA Power Networks - Determination 2020–25*, 4 March 2020; see also SA Power Networks, *SA Power Networks 2020–25 distribution determination in light of COVID-19*, 8 April 2020, SA Power

Other service providers also made a number of submissions to us on inflation, and in particular the inflation approach that would be applied for the final decisions for SA Power Networks, Energex, Ergon Energy, Directlink and JGN.

5.2 Our June 2020 final decisions

Final decisions for SA Power Networks, Energex, Ergon Energy, Directlink and JGN would typically have been released on 30 April 2020. We ran a short consultation process on our proposal to delay our final decision and use the RBA's Statement on Monetary Policy (SMP) for May 2020 of short-term expected inflation rather than its February forecast. We expected the RBA's May 2020 forecast would reflect recent changes arising from the impact of COVID-19.

After the release of the RBA's 8 May 2020 SMP, SA Power Networks provided a number of comments,[22] one of which was that the year-to-June 2021 CPI forecast was 'distorted' by the Federal Government's short-term childcare subsidy.

In our final decision, to address concerns about transient volatility affecting CPI forecasts, we used the RBA's trimmed mean inflation (TMI) forecasts for the first two regulatory years (year-to-June 2021, and year-to-June 2022). Our usual method is to use the (headline) CPI forecasts for these periods.[23]

This decision was based on the impact of COVID-19 pandemic in the May 2020 SMP only, where we considered that the TMI series better reflected expectations of core inflation as set out in the RBA's SMP and was the best possible estimate of expected inflation in the circumstances.

These final decisions were made recognising the uncertainty caused by the COVID-19 pandemic, and were unique to the economic conditions of May 2020. Our final decisions noted that our use of TMI should not be taken as a precedent for the outcomes of this inflation review.

In May 2020, we commenced this review of the treatment of inflation within the regulatory framework to consider the issues that have been raised with us.

Networks, *Email re: URGENT SA Power Networks 2020–25 Revised Proposal, Covid-19*, 14 April 2020, SA Power Networks, *Letter re: Proposal to delay final decisions for SA Power Networks, Energex, Ergon Energy, Directlink and Jemena Gas Networks*, 28 April 2020; *SA Power Networks, Inflation forecast for SA Power Networks 2020–25 revenue determination*, 11 May 2020.

22 SA Power Networks, *Letter re: SA Power Networks - Determination 2020–25*, 11 May 2020.

23 The PTRM method specifies that we will use RBA SMP inflation forecasts for the first two years, but does not specify the series used.

6 How have we gone about this review?

Consultation for this review has been somewhat impacted by the COVID-19 pandemic. Consequently, our public forum and technical workshops were run virtually. Despite these limitations, we have engaged in robust discussions with stakeholders, including the Consumer Reference Group (CRG),[24] service providers and investor groups.

The timetable has also been impacted by the revenue resets currently underway. Subject to any transition, we considered that any change in methodology for estimating expected inflation resulting from the review should be able to be implemented in the revenue resets to take effect from mid-2021. However, changes in the framework that require rule changes would not be able to be implemented in time for these resets.

Our website contains all material that stakeholders have submitted as part of this consultation, along with models, presentations and expert reports.[25]

6.1 Inflation review stage one consultation

The following section outlines stakeholder engagement undertaken since initiating this review.

6.1.1 Discussion paper

The purpose of our discussion paper was to:

- Set the scope of the 2020 inflation review
- Provide information on key concepts, including details on our inflation models (PTRM and RFM) and pricing mechanisms
- Pose questions[26] and seek stakeholder input.

6.1.2 Public forum

On 2 July 2020, we held a virtual public forum as part of our industry-wide consultation. This forum involved presentations by us, service provider industry bodies and the CRG.

Due to the high number of attendees at the virtual forum, stakeholders were invited to email questions to presenters. Presenters' responses to all questions were published in our Q&A document following the forum.[27]

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[24] Information on the Consumer Reference Group, its role and members is available at: https://www.aer.gov.au/about-us/stakeholder-engagement/consumer-reference-group

[25] Available at https://www.aer.gov.au/networks-pipelines/guidelines-schemes-models-reviews/review-of-treatment-of-inflation-2020

[26] AER, *Discussion paper - Regulatory treatment of inflation*, May 2020, pp, 16-17.

[27] See: https://www.aer.gov.au/system/files/AER%20-%20Inflation%20review%20public%20forum%20Q_A%20-%20July%202020.pdf

At this time, we decided to extend our closing date for submissions to the discussion paper from 15 to 29 July 2020. This extension provided stakeholders with an opportunity to consider consultants' reports that only became available in early July, and for further discussions between all stakeholders.

6.1.3 Technical workshop

We invited interested stakeholders to attend a virtual technical workshop to explore various approaches to estimating expected inflation, the mechanics for implementing each scenario and stakeholder impacts.

We held the technical workshop on 13 August 2020, with 19 participants from the AER, service providers, industry bodies and the CRG. We presented simulated modelling for a range of options.

Our presentation and simulated models are available on our website.[28]

6.2 Our expert advice

We obtained independent expert advice to consider a range of issues within the scope of this review. A summary of their respective reports follows.

6.2.1 Deloitte Access Economics

Deloitte was asked to provide an assessment of whether our current approach, or an alternative approach, derives the best estimate of expected inflation in the context of the NER and NGR requirements.

In assessing the five methods included in our discussion paper, Deloitte's report concluded that two approaches suitable for recommendation by us were our current approach and a glide-path approach.[29] In reaching their conclusions, Deloitte assessed options against the following criteria:

- Simplicity
- Transparency
- Replicability
- Congruence and robustness.

In assessing the options, Deloitte noted that the swaps and break-even bond inflation rate provided market-based measures, however their approaches were affected by the presence of material and time-varying distortions that limit their use in a regulatory context.[30] Similarly for surveys, Deloitte noted that although surveys rank high in their

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[28] See: https://www.aer.gov.au/networks-pipelines/guidelines-schemes-models-reviews/review-of-treatment-of-inflation-2020/initiation

[29] Deloitte Access Economics, *Review of the regulatory treatment of inflation*, 30 June 2020, pp. 7-10.

[30] Deloitte Access Economics, *Review of the regulatory treatment of inflation*, 30 June 2020, pp. 7-10.

relative congruence with market expectations, their use is limited by their lack of transparency and replicability.[31]

In providing this recommendation, Deloitte considered whether inflation expectations have de-anchored from the RBA target band. This involved consideration of a number of research papers, including, notably, recent papers from international studies.

In considering these papers, Deloitte noted that there is little evidence that Australian inflation expectations have been de-anchored from the RBA's target band. In making this conclusion, Deloitte did note that there remains significant limitations in the current academic literature, most noticeably in 2019 and 2020 where some measures of Australian inflation expectations have shown signs of movement.[32]

6.2.2 Dr Martin Lally

Dr Lally was asked to consider estimating expected inflation for various future periods of time, i.e. for each future period, the mean of the probability distribution of all possible outcomes over that period, with the probability distribution reflecting the best currently available information.

The expert report prepared by Dr Lally recommended that we should estimate expected inflation over five years rather than ten.[33] Dr Lally proposed this change because:

- The use of a five year term for the estimate of expected inflation ex-ante matches the indexation of the RAB for actual inflation over the regulatory period.
- Using a five year term for the estimate of expected inflation when the regulatory cycle is five years provides for net present value (NPV) neutrality if a five year rate of return is also used. In this scenario, there will be no significant gain or loss for a service provider or consumers.[34]
- It is appropriate to use a five year term for the estimate of expected inflation even if you use a ten year time horizon for estimating the rate of return. This is because the rate of return is generally upward sloping, while an estimate of expected inflation is as likely to be downwards as upwards sloping. Therefore, there is no benefit of using a ten year estimate of expected inflation over a five year estimate.[35]

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31 Deloitte Access Economics, *Review of the regulatory treatment of inflation*, 30 June 2020, pp. 7-10.

32 Deloitte Access Economics, *Review of the regulatory treatment of inflation*, 30 June 2020, pp. 30-32.

33 Dr Martin Lally (Capital Financial Consultants Ltd), *Review of the AER's inflation forecasting methodology*, 8 July 2020.

34 Dr Martin Lally (Capital Financial Consultants Ltd), *Review of the AER's inflation forecasting methodology*, 8 July 2020, p. 6.

35 Dr Martin Lally (Capital Financial Consultants Ltd), *Review of the AER's inflation forecasting methodology*, 8 July 2020, p. 6.

We are inclined to agree with Dr Lally's reasons to the extent it applies to expected inflation.[36] We also note that estimating expected inflation over five years rather than ten reduces the uncertainty associated with our estimate and gives greater weight to current market conditions. We acknowledge the point that Dr Lally has made in regard to the alignment with the term for the rate of return estimate. However, any decision from this review will not pre-empt a decision on the term for the rate of return, should it be considered, in the review of the Rate of Return Instrument 2022.

6.2.3 Sapere Research Group

The Sapere Research Group (Sapere) was asked to consider whether the regulatory framework successfully delivers the expected real rate of return, and whether we should instead target a nominal or hybrid return. Sapere's preliminary conclusion to both questions were 'yes' and 'no' respectively.

In addressing the first issue, Sapere noted that:[37]

- The current regulatory framework for inflation is consistent with the regulatory objective. Sapere tested this outcome through formal modelling (algebraic equations) and by spreadsheet modelling scenarios over multiple regulatory periods. Sapere noted that our current approach delivers the intended real rate of return regardless of whether actual inflation is above or below our estimate of expected inflation.
- In assessing whether these models are NPV neutral, Sapere noted that there was a first year pricing effect, which created a small deviation from the target return.[38]

In considering the second issue, Sapere noted that some stakeholders have correctly identified that our current approach may result in negative cash returns to equity if the allowed rate of return on equity is low, or the service provider has high leverage. Sapere stated that it may indicate an inconsistency in our approach if it persists. However, Sapere also noted that the total return on equity, which includes asset revaluation, is positive. Further, Sapere noted that when actual inflation is low relative to expected inflation, then the return on capital might be insufficient to meet the service provider's interest obligations.[39]

Further, when assessing whether we should change approach, Sapere considered two types of hybrid frameworks:[40]

1. Including interest on debt as an expense in setting the annual revenue requirement

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[36] That is, our draft position on this issue is independent of any change that may be required to the term for the rate of return.

[37] Sapere, *Target return and inflation - Input to the AER Inflation Review 2020*, 30 June 2020, pp. v – vi.

[38] Sapere, *Target return and inflation - Input to the AER Inflation Review 2020*, 30 June 2020, p. 12.

[39] Sapere, *Target return and inflation - Input to the AER Inflation Review 2020*, 30 June 2020, p. 30.

[40] Sapere, *Target return and inflation - Input to the AER Inflation Review 2020*, 30 June 2020, p. 30.

Sapere assessed that this type of hybrid would make no difference to the cash rate of return on equity; therefore it would not address the concerns raised by stakeholders.

2. Decomposing the expected revaluation gain into a revaluation gain for equity holders and an expense in setting the annual revenue requirement

Sapere assessed that this would shift the regulatory framework from targeting a real rate of return to targeting a real rate of return on equity. Sapere noted such a change would intervene in the capital structure decision and result in a less efficient allocation of the risk of financing decisions. Chapter 16 discusses some of the implications of changes to the rate of return targeted in the framework.

Although Sapere concluded that we should continue to target a total real return, it does note that a sustained fall in inflation expectations would imply a negative cash flow return on equity for a benchmark efficient entity regardless of actual inflation—before the positive asset revaluation is accounted for. Sapere noted that we should consider whether a projected negative cash return on equity might indicate an underlying inconsistency in one or more inputs into the rate of return and expected inflation.[41]

[41] Sapere, *Target return and inflation - Input to the AER Inflation Review 2020*, 30 June 2020, pp. 27-28.

7 What is the history on the regulatory treatment of inflation?

The treatment of inflation in the regulatory models, and in particular the use of a real return framework, has long standing regulatory precedent. It has been applied in all of our regulatory gas and electricity determinations. Internationally, the Brattle Group recently undertook a review of international approaches to regulated rates of return.[42] It found that the majority of regulatory regimes it examined used a real rate of return framework, with a minority using a nominal rate of return.[43] ATCO Australia also noted the use of a nominal approach in regulatory decisions in North America.[44] In addition, we are aware that the New Zealand regulator does not index the RAB for inflation for Transpower, NZ's electricity transmission provider, which the NZ Commerce Commission indicates results in it receiving ex-post nominal returns.[45]

A real rate of return framework was also used in relevant ACCC energy sector decisions prior to the creation of the AER. We can trace the framework back to the ACCC's 1999 *Draft Statement of Principles for the Regulation of Transmission Revenues* (DPR). The DPR stated:[46]

> The key elements of the Commission's framework are:
>
> - a revenue cap based on forecasts of the cost of service;
> - CPI–X adjustment of the revenue cap and inflation adjustment of the regulatory asset base on an annual basis. This feature is designed to minimise any inflation risk to the business;
> - the return on assets determined on a post-tax nominal basis with estimated tax relevant to the regulatory period treated explicitly as a component of the cost of service;…

In combination, these components will deliver a real outcome by having regard to inflation effects—that is, expressed in nominal terms.

These elements were preserved when we moved from the National Electricity Code to the NER, and the rules were explicitly drafted to codify existing practice in these areas.

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42 The Brattle Group, *A Review of International Approaches to Regulated Rates of Return prepared for the Australian Energy Regulator*, June 2020.

43 The Brattle Group, *A Review of International Approaches to Regulated Rates of Return prepared for the Australian Energy Regulator*, June 2020, p. 20.

44 ATCO, *Submission to discussion paper, inflation review 2020*, July 2020, pp. 8-9.

45 Commerce Commission New Zealand, *Input methodologies review decisions Topic paper 1: Form of control and RAB indexation for EDBs, GDBs and Transpower,* 20 Dec 2016, p. 3; Commerce Commission New Zealand, *Input methodologies review draft decisions Topic paper 1: Form of control and RAB indexation for EDBs, GDBs and Transpower,* 20 Dec 2016, p. 55.

46 ACCC, *Draft Statement of Principles for the Regulation of Transmission Revenues*, May 1999, p. 16.

For instance, the AEMC stated in its 2006 decision on the 6A transmission revenue and pricing rules:[47]

> …
>
> As part of the roll-forward of the RAB, the Draft Rule requires the AER to adjust the RAB to reflect actual inflation. However, under the post-tax nominal framework, TNSPs are compensated for inflation via a nominal return on capital. In order to ensure that the TNSPs are not over-compensated for inflation, the impact of the indexation of the RAB needs to be removed in calculating the building block revenue requirement. This is allowed for in the Rule Proposal and reflects current AER practice. The Commission notes that currently the AER combines depreciation and indexation of the RAB into what it terms 'economic depreciation'.

The 1999 DPR described the advantages of this approach as follows:[48]

> - it incorporates the best features of the real and the nominal approaches i.e. the minimisation of inflation risk of a real framework with the direct application of nominal rate of return benchmarks;
> - the nominal post-tax framework eliminates the need to consider the conversion problem (i.e. from a nominal post-tax rate of return to a real pre-tax rate of return);
> - it provides for a rate of return, post-tax nominal, that is more familiar to financial markets, and is therefore comparable with other everyday financial benchmarks;…

We consider that the reference to 'the minimisation of inflation risk' refers to two (related) effects:

- The revenue recovered by the service provider will move in line with inflation, so the inflation risk that is minimised will be the risk that there is an inflation-driven difference between revenue and costs.
- The return to investors (in aggregate) will move in line with inflation, so that the inflation risk that is minimised will be the risk that there is an inflation-driven departure from their required real rate of return.

Since the service provider recovers revenue from consumers, this statement also implies that consumers are assigned the inflation risk. Consumers have certainty around the real cost of energy, but not the nominal cost.

While the regulatory framework remains largely unchanged, some aspects of our method to determine the best estimate of expected inflation have changed. Relevant aspects set out below.

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[47] AEMC, *Review of the electricity transmission revenue and pricing rules, Transmission revenue: Rule proposal report, Draft national electricity amendment (Economic regulation of transmission services) Rule 2006*, February 2006. pp. 11, 58–59.

[48] ACCC, *Draft Statement of Principles for the Regulation of Transmission Revenues*, May 1999, p. 16.

7.1 SP AusNet's 2007 transmission proposal

We first adopted our current approach when making our 2008 SP AusNet Transmission determination.

SP AusNet proposed the break-even approach[49] in its initial regulatory proposal. However, it subsequently modified its proposal[50] to remove the 'bias' in the break-even inflation estimate via a 20 basis point reduction in the estimate of inflation obtained using observed yields on Commonwealth Government Securities as a proxy for the real risk free rate.[51]

Our draft decision was to adopt an inflation estimate at the upper end of the RBA's target range (of 3 per cent) based on the RBA's short-term forecasts.[52]

In response to the draft decision, SP AusNet drew on CPI forecasts from a range of forecasters, and stated:[53]

> …for the purposes of clause 6A.6.2 of the NER, SP AusNet proposed the AER use 2.5 per cent as the best inflation forecast over the forthcoming regulatory period, as required under clause 6A.5.3(b)(1).

NERA, SP AusNet's consultant, submitted that for consistency with past regulatory practice, the inflation rate estimate term should match the term of the nominal Commonwealth Government Securities rate used in the rate of return calculation. A 10 year term has generally been used for this purpose.[54]

Our final decision was to adopt a 10 year term for the estimate of expected inflation to be consistent with past regulatory practice and stated:[55]

> In the absence of a reliable market-based estimate, and acknowledging the difficulty of forecasting inflation beyond the short-term, the AER considers 2.5 per cent to be a reasonable estimate of inflation beyond the RBA's forecast period. Averaging the RBA's forecasts for 2008 and 2009 with 2.5 per cent for the remaining 8 years produces a 10 year inflation forecast of 2.59 per cent, as shown in table 5.3 below.
>
> Further:[56]
>
> The AER's approach to forecasting inflation in this final decision has been in response to an acceptance that the previously ubiquitously used Fisher equation may not currently produce realistic inflation forecasts at this time, due

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49 The break-even approach or bond break-even inflation rate is a market-based measure of expected inflation. It is the difference between the yield of a nominal bond and an inflation-linked bond of the same maturity.

50 Via letter to the AER on 14 June 2007.

51 See AER website, supplementary submissions on risk free rate: https://www.aer.gov.au/networks-pipelines/determinations-access-arrangements/sp-ausnet-determination-2008-14/proposal

52 AER, *Draft decision for SP AusNet transmission determination 2008–09 to 2013–14*, 31 August 2007, pp. 114-124.

53 SP AusNet, *Revised revenue proposal*, 12 October 2007, p. 189.

54 SP AusNet, *Revised revenue proposal*, 12 October 2007, Appendix P, p. 51.

55 AER, *Final decision for SP AusNet transmission determination 2008–09 to 2013–14,* January 2008, p. 104.

56 AER, *Final decision for SP AusNet transmission determination 2008–09 to 2013–14,* January 2008, p. 105.

> to a bias in indexed CGS yields caused by the scarcity of these bonds. The AER considers that a market-based estimate derived from a robust methodology would be preferred to any other alternative method, as the former typically results in a greater degree of certainty and objectivity, however, it is not possible to use such a method at this time. The AER will continue to review this issue in consultation with stakeholders, in the context of the forthcoming WACC review.
>
> In the draft decision the AER determined it would take account of the RBA's target inflation band and its outlook for inflation to establish its best estimate of inflation. The RBA is the most authoritative source of advice on expected inflation, if a general approach to forecasting inflation is to be used. For the purposes of this final decision the AER considers a general forecasting approach as the methodology likely to produce the best estimates of forecast inflation

In summary, SP AusNet proposed an unbiased estimate of inflation expectations should be used over a 10 year term, and we agreed this would result in the 'best estimate' of inflation for use in the PTRM. The current approach was considered to give this unbiased estimate and has been used in all our regulatory determinations since that time.

It is also worth noting we reconsidered these issues in our 2008 decision for ElectraNet[57] and our 2017 inflation review.

We observe that our current method was adopted in response to service provider submissions proposing to move away from market-based measures, which they stated were biased. We agreed that the market-based measures were biased and adopted our current approach. Numerous submissions now propose that we should again employ market-based measures in our approach.[58] At this point, we do not think the submissions sufficiently address the deficiencies that we previously identified with market-based measures. We set out our detailed analysis at chapter 11.

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[57] AER, *ElectraNet Final Decision,* 11 April 2008, p. xiii.

[58] Submissions proposing the adoption of market-based measures include the ENA, Endeavour Energy, ATCO, APGA, Energy Qld, AusNet Services, AGIG, Ausgrid, Qld Treasury Corporation, CitiPower, Powercor, United Energy, TransGrid, Spark Infrastructure and SA Power Networks.

8 What are we seeking to achieve in this review?

Our role as a regulator, and therefore the outcome we are seeking to achieve in this review, is guided by the National Electricity and Gas Objectives (NEO and NGO).

NEO:[59]

> …to promote efficient investment in, and efficient operation and use of, electricity services for the long-term interests of consumers of electricity with respect to:
>
> - price, quality, safety, reliability and security of supply of electricity; and
> - the reliability, safety and security of the national electricity system.

NGO:[60]

> …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.

In addition, the revenue and pricing principles are an important consideration. They support the NEO and NGO and we have had regard to these principles in this review. In summary, the revenue and pricing principles are:[61]

- A service provider should be provided with a reasonable opportunity to recover at least the efficient costs the service provider incurs in:
  - providing regulated services; and
  - complying with a regulatory obligation or requirement or making a regulatory payment.
- A service provider should be provided with effective incentives in order to promote economic efficiency with respect to the regulated services they provide. The economic efficiency that should be promoted includes:
  - efficient investment in the energy network with which the service provider provides regulated network services; and
  - the efficient provision of regulated services; and
  - the efficient use of the energy network with which the service provider provides network services.
- Regard should be had to the RAB adopted:
  - in any previous determination or arrangement, or
  - in the rules.

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59 NEL, s. 7.

60 NGL, s. 24.

61 NEL, ss. 16(1)(a) and (2)(b); NGR, ss. 28(1)(a) and (2)(b) and RPPS are set out in NEL, s. 7A; NGL, s. 24.

- A price or charge for the provision of a regulated network service should allow for a return commensurate with the regulatory and commercial risks involved in providing the service.
- Regard should be had to the economic costs and risks of the potential for under and over investment by a service provider in the relevant energy network.
- Regard should be had to the economic costs and risks of the potential for under and over utilisation of the relevant energy network.

In addition, under s 16(1)(d) of the NEL, where there are two or more possible reviewable regulatory decisions that will or are likely to contribute to the achievement of the NEO, we must make the decision that we are satisfied will or is likely to contribute to the achievement of that objective to the greatest degree.

8.1 Applying the NEO and NGO

As noted in our discussion paper[62] and adopted by Deloitte in its report to us,[63] to assist us in applying the NEO and NGO in determining a method that is likely to result in the best estimates of expected inflation, we intend to have regard to the following factors:

- Relative congruence with the market expected inflation rate (i.e. whether estimates of a particular approach more closely correspond to the market-expected inflation rate). As noted in the ACCC/AER 2017 working paper, an approach may be considered relatively congruent if, for example:
    - There are several or more research findings that this method results in estimates of expected inflation which may contain zero, small or insignificant biases and/or distortions.
    - There are several or more research findings that this method produces estimates that closely mimic the characteristics and processes of market expectations of inflation.
    - There is less evidence that alternative methods produce estimates that more closely correspond to market expectations of inflation.
    - The biases, premia and/or distortions related to alternative methods are well documented in the literature and are difficult to estimate and remove.

  It is not possible to exactly measure the relative congruence of each approach in a way that can be compared. Rather, the above factors facilitate a ranking of the relative merits of the approaches.

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62 AER, *Discussion paper, Regulatory treatment of inflation*, May 2020, p. 28.

63 Deloitte Access Economics, *Review of the regulatory treatment of inflation*, June 2020, p. 33.

- Robustness – An approach is considered robust if it does not change significantly in response to events or data that have little or no influence on market expectations of inflation.
- Transparency and replicability – An approach that is transparent and replicable can be easily verified by stakeholders, improving regulatory certainty for stakeholders and reducing the risk that errors have been made in the calculation of estimates of inflation expectations for regulatory purposes.
- Simplicity – A simple approach is likely to produce estimates of expected inflation that require less effort to construct and check (for both the AER and stakeholders). A simpler method may also provide less scope for contention.

8.1.1 Assessment of submissions

The ENA is critical of the definition Deloitte adopted in its report to us for relative congruence, stating that Deloitte's approach is circular.[64] Notwithstanding the ENA's views of this specific issue, we will have regard to these factors in applying the NEO/NGO, and in a way that is consistent with our final decision of the 2017 inflation review, where we stated that:

> …relative congruence and robustness are considered to rank above all other criteria. However, the rankings are not considered to be absolute, there are always trade-offs. Therefore, at the margin, if a particular method is so complex that it is opaque and cannot be reproduced, the uncertainty and controversy over its estimates may result in other methods being ranked as best estimates, even if the other methods are considered to be marginally less congruent and robust.[65]

Professor Vahey similarly agreed, stating:

> There are trade-offs between the criteria, all of which are appealing on an individual basis. For example, a measure that ranks well in terms of simplicity may not be congruent with the market expected inflation rate. The AER draft position sensibly takes a broad perspective of the candidates and applies appropriate judgement to produce the ranking. Economic theory is silent on what represents the best measure of expected inflation and absent a generally accepted econometric procedure to estimate the theoretical concept, the pragmatic perspective shared by both the ACCC/AER working paper and the AER draft position seems right.[66]

We consider a method to estimate expected inflation that achieves the following properties is likely to be capable of achieving the NEO and NGO:

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64 ENA, *Submission to discussion paper, 2020 inflation review*, July 2020, pp. 60 and 65–66.

65 AER, *Final position paper, Regulatory treatment of inflation*, December 2017, p. 119.

66 Professor Shaun P Vahey, *Report to the AER on estimating expected inflation*, 15 September 2017, p. 4.

- It results in correct ex-ante compensation over the life of the assets (i.e. cash flows with a present value equal to the total value of the investment in the RAB over the life of the assets).
- It results in an efficient allocation of risk.

We have considered these matters in assessing whether changes will better meet the NEO and NGO. While a change may meet some objectives, it might not be preferable. For example, a hybrid approach might be implemented in a manner that would provide correct ex-ante compensation over the life of the assets. However, we consider that it will not better achieve the NEO and NGO than our proposed real return framework approach due to the risk allocation.

8.2 What is a 'best estimate' of expected inflation and why is it important?

In order to achieve the NEO and NGO to the greatest degree, the method we determine for expected inflation must be a method likely to produce a 'best estimate'. The challenge in determining the best estimate of inflation expectations are that these expectations are not directly observable.

This wording 'best estimate' was first introduced into the NER in 2006 as part of the AEMC's Economic Regulation of Transmission Services rule change (the 2006 rule change process). Appendix B sets out the extrinsic material of this rule change process.

We remain of the view, and in light of the appendix B, that the term 'best estimate' is intended to require the inflation estimate to be an unbiased estimate of expected inflation.

Unbiased in this context means the estimate should reflect expected inflation only and should not reflect any risk premiums or other factors that would cause the estimate to not equal expected inflation. In the current process, the ENA proposed we should include an inflation risk premium in the inflation estimate.[67] In our view this would not result in the best estimate of expected inflation as required by the NER and NGR because it would introduce a bias.

As noted below, sometimes the actual nominal return will be above the nominal return set in the determination and sometimes it will be below it due to variations between expected inflation and actual inflation. However, this does not result in incorrect compensation as:

- real returns on assets and real prices are not affected, and
- nominal outcomes are reflected in the market data we observe when setting the rate of return, especially in the equity beta and market risk premium.

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[67] ENA, *Submission to discussion paper, inflation review 2020*, July 2020, p. 43.

8.2.1 What if actual inflation varies from our estimated inflation expectation?

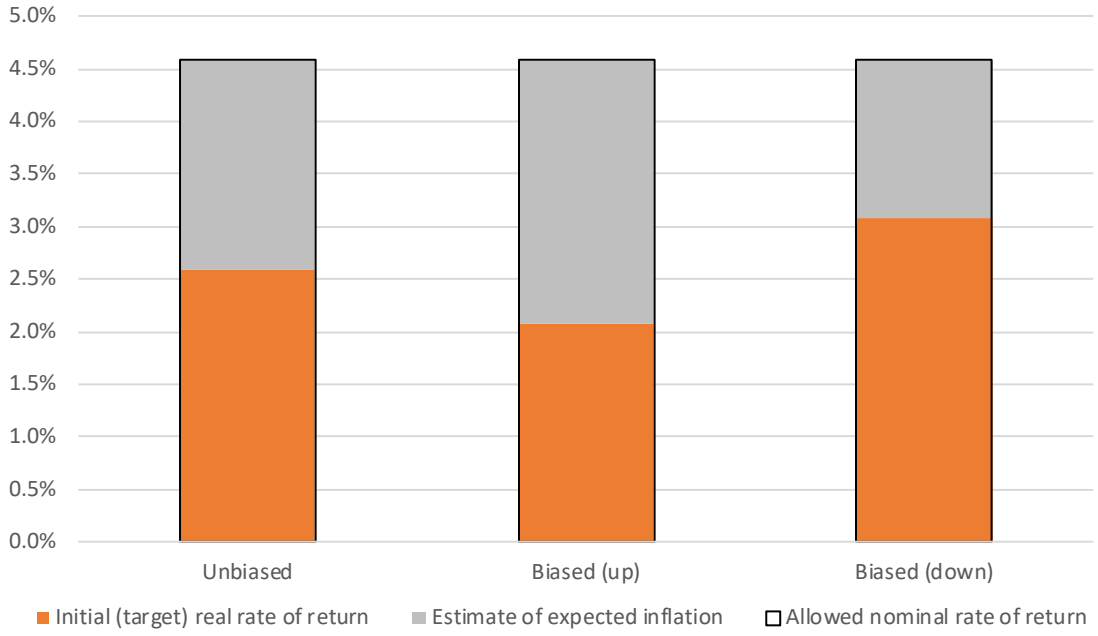
It is important that we distinguish between expected inflation and actual inflation. At the time we make a determination investors will have an expectation of what inflation might be going forward, but actual inflation will be different to investors' expectations and our estimate of expected inflation. The key questions are:

- Does the estimate of inflation expectations reflect expectations at that point in time?
- Does the regulatory framework still provide the service provider with a reasonable opportunity to recover the revenue allowed?

The merits of an estimate of expected inflation cannot be tested by looking at subsequent inflation outcomes. However, if our estimate of expected inflation is biased, there will be a mismatch between the expectations of investors and our revenue allowance. A bias would result in us effectively setting the incorrect revenue allowance. This would not advance the NEO or NGO and may result in too much or too little investment. In addition, consumers will pay too much or too little and may not receive the energy services they want.

Figure 3 demonstrates the impact of a biased inflation estimate on the initial rate of return. For example, if actual inflation was 2.5 per cent, but the method used to estimate expected inflation was biased, the expected inflation estimate observed using this method might be higher than 2.5 per cent (for example 3 per cent). This would result in the initial real rate of return being set lower than using an unbiased estimate—assuming the same allowed nominal rate of return. This is illustrated in the third bar of figure 3. This may result in under-investment in the energy network, and consumers paying less than necessary for network services. The converse also applies (second bar in figure 3).

Figure 3 Impact of a biased inflation estimate on initial rate of return



Allowed returns can be expressed as either nominal or real returns. These returns can be specified as either on the total assets or targeted at equity. Once the basis of the allowed returns is determined, the ex-ante (can be thought of as the expected) return on both assets and equity in real and nominal terms can be determined for a given set of inflation expectations. The regulatory framework can be designed to target a constant real return on assets. If so, and actual inflation varies from expected inflation, then the nominal returns on assets and equity and the real return on equity will vary from their expected values. Alternatively, the regulatory framework could be designed to target a constant real return on equity. If so, the real and nominal returns on assets will vary from their expected values if inflation differs from expectations. In other words, all four measures of return (real/nominal returns on assets/equity) cannot be held constant under a single approach.

The current framework specifies the return in terms of the ex-ante real return on assets and the framework ensures that this can still be achieved if actual inflation varies from expectations. However this means that ex-post nominal returns will be different from the expected returns.[68] What is important is that investors are compensated for their estimate of expected inflation and the risk that the expectation might not be achieved. The first is compensated directly in the revenue allowance calculated in our PTRM, the second is compensated in the rate of return we apply.

[68] Refer to chapter 16 and appendix I for further details.

8.2.2 ENA's proposed objective

The ENA submitted the objective we should target is an approach that results in a regulatory allowance (specifically nominal return on debt) that matches a service provider's efficient financing costs.[69]

We do not agree with this submission. We are guided by the NEO and NGO. This requires us to make a determination that provides adequate financing for the safe and efficient operation and use of energy services in the long-term interests of consumers. However, there is no requirement for us to set allowances that match a particular financing practice.

Specifically, the effect of the rule requirements is the application of an efficient real rate of return rather than a nominal rate of return or to separately apply a nominal debt. The estimation of the cost of debt is an input into the estimation of the rate of return, and not an end in itself. The rules do not require the recovery of costs arising from a specific financing practice, and we do not consider that a decision to do so would advance the NEO or NGO.

Rather, as outlined above, we should adopt a method that results in the correct ex-ante compensation over the life of the assets and in an efficient allocation of risk.

8.2.3 Consumer Reference Group

The Consumer Reference Group (CRG) provided a late submission[70] setting out the framework it will adopt in deciding whether to support any proposed changes to our current approach. The four point framework is:

> i. Whether the AER provides conclusive evidence of a persistent bias in its methodology for estimating inflationary expectations, and whether an alternative methodology demonstrably lessens that bias.
>
> ii. Whether the AER has modelled the impact on consumer prices of (i) changing its methodology for estimating inflationary expectations, and (ii) any shift towards a hybrid approach. We consider 'back-casting' to be the most effective way for assessing the impact of these changes for consumers. This involves comparing a baseline of the AER's past regulatory decisions against how they would hypothetically have differed in light of (i) and (ii).
>
> iii. Whether the AER commits to deferring a final decision on the regulatory treatment of inflation so any changes are considered in conjunction with potential changes to the rate of return instrument.
>
> iv. If the AER countenances a change to the regulatory treatment of inflation when doing so will clearly favour the networks, the CRG expects the AER to

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69 ENA, *Submission to discussion paper, 2020 inflation review*, July 2020, p. 6.

70 CRG, *Letter to AER Board*, 1 September 2020, p. 2.

identify an approach to sharing with consumers any resultant short-term benefits that would otherwise accrue in their entirety to the networks.

The CRG submitted that such a framework is required for consumer confidence in the regulatory framework and the AER to prevail. The CRG will support changes, with appropriate evidence where there are demonstrable material systemic problems.

The CRG submitted that any change in our approach to estimating expected inflation must be persistent over time (i.e. no further review in a few years), and not be a response to service providers seeking to 'tweak' parameters to address transient issues over say, one regulatory period.[71]

The framework the CRG uses to assess options of producing the best estimates of expected inflation is a matter for the CRG. We understand the views of the CRG and will continue to evaluate proposals according to the NEO/NGO. We are also alert to the impact our draft position may have on consumers, and have investigated the implications for consumers and service providers in chapter 14. We also consider the impact of the timing and whether a transition to our draft position may be required in chapter 15.

The CRG's submission also raised concerns that our work program is susceptible to service providers 'cherry picking' issues.[72] We agree in principle, and are aware of this potential. To the extent we can look across the impacts and interrelationships with the broader framework we do. We also need to be responsive to new information and evidence and in this case, the data we monitor and material in front of us warranted a review of our approach to determine whether it continues to deliver the best estimates of expected inflation.

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71 CRG, *Letter to AER Board*, 1 September 2020, p. 2.

72 CRG, *Letter to AER Board*, 1 September 2020, p. 1.

9 What have stakeholders said to us?

The following table provides a summary of stakeholder submissions received in response to our discussion paper. The table refers to 'Issue 1', 'Issue 2' and 'Issue 3'. This corresponds to the issues as defined in our discussion paper. That is:

- Issue 1: What method should we use to estimate expected inflation?
- Issue 2: Does the regulatory framework successfully deliver the expected real rate of return under the current approach?
- Issue 3: Should we instead target a nominal or hybrid rate of return?

We received 25 submissions from consumer groups, service providers, industry groups and investor groups.

Our responses to stakeholder submissions are set out in appendices C ('Issue 1'), F ('Issue 2') and G ('Issue 3').

Table 1 Stakeholder submissions on issues 1, 2 and 3

Submitter	Issue 1	Issue 2	Issue 3
Consumer Representatives[73]			
CRG	Maintain current approach with possible use of glide-path approach	Expected real rate of return delivered	Consumer impact of any change to current regulatory framework needs to be considered
Comments	**Issue 1** Submitted the current approach best satisfies the fundamental regulatory principles,[74] and that long-term interests of consumers are likely to be best served by the AER continuing to apply its current methodology to estimating expected inflation.[75] Noted that there is rationale for use of a glide-path with COVID-19 expected to impact the time for inflation to revert to the RBA's mid-point.[76] Provided a number of considerations for the AER to investigate in implementing a glide-path.[77] Considered that surveys and market-based measures should not be used to estimate expected inflation. Provided that surveys whilst being useful to validate the AER's estimate of expected inflation, would not be a reliable basis for estimating estimated inflation in the regulatory framework.[78] Noted that the two market-based measures (break-even inflation and swaps) have significant limitations,[79] and that the CRG 'would need additional information on how inflation swaps are priced in financial markets, their liquidity and ability to be used as an unbiased estimate for expected inflation.'		

[73] Fairbane Group also provided a submission, which did not provide any comments on the issues included in the Discussion Paper.

[74] CRG, *Submission to discussion paper, inflation review 2020*, July 2020, p. 22.

[75] CRG, *Submission to discussion paper, inflation review 2020*, July 2020, p. 32.

[76] CRG, *Submission to discussion paper, inflation review 2020*, July 2020, pp. 26-28.

[77] CRG, *Submission to discussion paper, inflation review 2020*, July 2020, p. 28.

[78] CRG, *Submission to discussion paper, inflation review 2020*, July 2020, p. 28.

[79] CRG, *Submission to discussion paper, inflation review 2020*, July 2020, p. 28.

Submitter	Issue 1	Issue 2	Issue 3
	Noted the evidence provided by Deloitte,[80] Lally and Vahey in the 2017 Review,[81] and Lally in the current review[82] to suggest that 'the construction of the yield curve, the bond market volatility and the risk and liquidity premia (and) the inability to isolate these two effects over time and the sensitivity of demand for these securities to expected inflation mean that the market-based approaches are not appropriate for the regulatory task.'[83] **Issue 2** Accepted the Sapere finding that service providers earn the real rate of return determined in each regulatory decisions by the AER.[84] **Issue 3** Assessed the two alternatives (nominal and hybrid) through preliminary consumer research which focused on the prime impact, volatility and risk allocation for each approach.[85] Noted that this indicated that volatility in prices had a negative impact on consumers, and that consumer interests are well-served by a stable regulatory framework.[86] Considered that the AER should adopt a high bar for changes to the framework,[87] and noted the AER's comments in the Discussion Paper that an alternative framework would be "a material change with wide-ranging impacts.'[88] In assessing a change to the framework, submitted that more evidence is needed, particularly from service providers, to demonstrate how a change to a nominal or a hybrid model would impact consumer prices and service levels over more than one regulatory period.[89] Also expects to recommend and/or undertake further research to add to the evidence of consumer views on whether any proposed changes would impact negatively in consumers' confidence in the regulatory framework.[90]		
ECA	Maintain current approach	Expected real rate of return delivered	Current regulatory framework should not change.
Comments	**Issue 1** Noted the task of the AER is not to forecast inflation, but to derive a 'best estimate of expected inflation,' with best being the method which promotes the long-term interests of consumers.[91] **Issue 2** Referenced the Woollahra Partners report from the 2017 Inflation Review, which provided that the impact of differences between expected and actual inflation is small and symmetrical, and over time service providers will not suffer economic loss from the real rate of return if the variation between expected and actual is uniform.[92] **Issue 3** Noted that the case for a change to a nominal or hybrid approach has not been made sufficiently.[93] Provided that there has been no research on consumer preferences for the price		

80 CRG, *Submission to discussion paper, inflation review 2020*, July 2020, p. 29.
81 CRG, *Submission to discussion paper, inflation review 2020*, July 2020, pp. 29-30.
82 CRG, *Submission to discussion paper, inflation review 2020*, July 2020, p. 30.
83 CRG, *Submission to discussion paper, inflation review 2020*, July 2020, p. 31.
84 CRG, *Submission to discussion paper, inflation review 2020*, July 2020, p. 2.
85 CRG, *Submission to discussion paper, inflation review 2020*, July 2020, pp. 35-36
86 CRG, *Submission to discussion paper, inflation review 2020*, July 2020, pp. 35-36
87 CRG, *Submission to discussion paper, inflation review 2020*, July 2020, pp. 36
88 CRG, *Submission to discussion paper, inflation review 2020*, July 2020, pp. 36
89 CRG, *Submission to discussion paper, inflation review 2020*, July 2020, p. 38.
90 CRG, *Submission to discussion paper, inflation review 2020*, July 2020, p. 38.
91 ECA, *Submission to discussion paper, inflation review 2020*, July 2020, pp. 2-3.
92 ECA, *Submission to discussion paper, inflation review 2020*, July 2020, p. 4.
93 ECA, *Submission to discussion paper, inflation review 2020*, July 2020, p. 4.

Submitter	Issue 1	Issue 2	Issue 3
	path of energy prices, and that this research must be done by service providers.[94] Recommended that this is done in consultation with the CRG.[95] Questioned the assertion that a change in framework will not change the risk profile of service providers and consumers.[96] Concerned that the normal correlation between the risk free rate and inflation outcomes has been reversed in the recent period.[97]		
EUAA	Maintain current approach with possible use of glide-path approach	Expected real rate of return delivered	Any change to regulatory framework should be considered in rate of return.
Comments	**Issue 1** Submitted the current approach has the greatest strength and the fewest weaknesses.[98] Noted that there is rationale for use of a glide-path with COVID-19 expected to impact the time for inflation to revert to the RBA's mid-point.[99] Provided a number of considerations for the AER to investigate in implementing a glide-path.[100] **Issue 2** Noted that the Sapere report confirms the findings of the 2017 Inflation Review.[101]		
MEU	No comment	Noted issues with the regulatory framework delivering the expected real rate of return	Target a nominal rate of return
Comments	**Issue 3** Proposed the implementation of ex-post adjustment for the difference between forecast and actual inflation. This would appear to target the nominal rate of return on capital.[102]		
PIAC	Maintain current approach	No comment	Any change to regulatory framework would need to be modelled.
Comments	**Issue 1** Noted any changes which materially shifts risk between consumers, service providers and investors would need to be backed by modelling which shows it is in consumers' interests.[103] Inflation risk should be managed by the party who is best able to manage the risk.[104] **Issue 3** Submitted that any change to the regulatory framework needs to be modelled and shown to be in consumers' interests.[105]		
Dr Ron Ben-David	No comment	No comment	Alternative approach

94 ECA, *Submission to discussions paper, inflation review 2020*, July 2020, p. 4.
95 ECA, *Submission to discussions paper, inflation review 2020*, July 2020, p. 4.
96 ECA, *Submission to discussions paper, inflation review 2020*, July 2020, p. 4.
97 ECA, *Submission to discussions paper, inflation review 2020*, July 2020, pp. 4-5.
98 EUAA, *Submission to discussions paper, inflation review 2020*, July 2020, p. 2.
99 EUAA, *Submission to discussions paper, inflation review 2020*, July 2020, p. 2.
100 EUAA, *Submission to discussions paper, inflation review 2020*, July 2020, p. 2.
101 EUAA, *Submission to discussions paper, inflation review 2020*, July 2020, p. 3.
102 MEU, *Submission to discussions paper, inflation review 2020*, July 2020, pp. 8-9.
103 PIAC, *Submission to discussions paper, inflation review 2020*, July 2020, p. 1.
104 PIAC, *Submission to discussions paper, inflation review 2020*, July 2020, p. 1.
105 PIAC, *Submission to discussions paper, inflation review 2020*, July 2020, p. 1.

Submitter	Issue 1	Issue 2	Issue 3
Comments	Proposed an alternative approach for estimating expected inflation, which involves service providers estimating the expected inflation pursuant to an incentive mechanism.[106]		
Service Provider and Industry Groups			
AGIG	Market-based measures	Expected real rate of return delivered but noted issues	Adopt hybrid approach
Comments	Endorsed the submission of ENA and APGA.[107]		
APA Group	No comment	Does not deliver real rate of return, unless very specific circumstances	Requires further discussion
Comments	**Issue 2** Submitted that its modelling indicates that the current regulatory approach to inflation does not, in general, deliver a target ex-ante real rate of return, although it might do so in very specific circumstances.[108] Noted that this can occur when 'actual inflation turns out to be the same as expected inflation, and if the expectations of inflation incorporated in nominal rates of return on equity and debt are the same as expected inflation.'[109] Noted that they have modelled where expected inflation is above the actual inflation, and noted that the current approach does not deliver a real rate of return which is equal to the target ex-ante expected real rate of return.[110] Provided that there is nothing in the scheme of the RFM, PTRM an annual price adjustment mechanism which corrects for this under-recovery of capital.[111] Submitted that their modelling, indicates that with current inflation around 2%, investors could lose 1.5% of their investment as a result of expected inflation being set "high" using the current approach, which is a large absolute loss for the investors.[112] **Issue 3** Noted that there may be no way of improving the current approach.[113] Stated that a hybrid approach may be required, but noted they have not seen and have not, developed such an approach and that do not know how a hybrid will deliver a target ex-ante real rate of return on equity.[114] Noted the need for further discussion on the hybrid with all stakeholders – 'the AER, service providers, users of regulated network services, and end users of electricity and gas.'[115]		
APGA	Market-based measures	Expected real rate of return delivered but noted issues	Adopt hybrid approach
Comments	**Issue 1** Noted the current approach systematically overestimates inflation and that it is not reflective of market conditions.[116] This estimation error has been caused by stakeholders being vague about what "expected inflation" actually means and what is being tested in the sources that we have relied upon in concluding the best approach.[117]		

106 Dr Ron-Ben David, *Submission to discussion paper, inflation review 2020*, July 2020, pp. 6-15.
107 AGIG, *Submission to discussion paper, inflation review 2020*, July 2020, p. 1.
108 APA Group, *Submission to discussion paper, inflation review 2020*, July 2020, p. 2.
109 APA Group, *Submission to discussion paper, inflation review 2020*, July 2020, p. 2.
110 APA Group, *Submission to discussion paper, inflation review 2020*, July 2020, p. 2.
111 APA Group, *Submission to discussion paper, inflation review 2020*, July 2020, pp. 2-3.
112 APA Group, *Submission to discussion paper, inflation review 2020*, July 2020, p. 3.
113 APA Group, *Submission to discussion paper, inflation review 2020*, July 2020, p. 4.
114 APA Group, *Submission to discussion paper, inflation review 2020*, July 2020, p. 4.
115 APA Group, *Submission to discussion paper, inflation review 2020*, July 2020, p. 4.
116 APGA, *Submission to discussion paper, inflation review 2020*, July 2020, p. 8
117 APGA, *Submission to discussion paper, inflation review 2020*, July 2020, p. 8.

Submitter	Issue 1	Issue 2	Issue 3
	Noted sources and papers published by the central banks on inflation, are based on different proxies and variables and that any assessment of their findings of bias or otherwise needs to be considered in this context.[118] Surveys were ranked last as a method for estimating expected inflation in the 2017 Inflation Review, however are used as a proxy in almost all the studies relied upon by the AER to determine its choice of a proxy for expected inflation.[119] Submitted that due to this 'where surveys give different results to the market, the market is far more likely to be providing the right answer.'[120] Preferred method based on analysis of evidence, suggested market-based measures 'ought to play a bigger role, even if the RBA forecasts remain in use for short-term forecasts.'[121] Noted that the swap rate is the more apt market-based measure, not necessarily because of any improvement in predictive performance, but rather because it produces exactly the same result as the AER is seeking, with less volatility for service providers and consumers.[122] Submitted the AER's current approach to inflation creates a swap contract between service providers and consumers, where service providers 'pay fixed and receive floating, and consumers receive fixed (in the reduction in price at the outset that comes from subtracting inflation from depreciation) and then pay floating.'[123] Noted that this swap at the moment 'goes against' service providers however, if the market-based measures were higher than our fixed rate, consumers would be paying more than they need to, without the possibility of recompense.[124] Due to this volatility, the AER should give more weight to the swap rate in order to make prices more stable for consumers.[125] **Issue 2** Agreed that our framework of RFM, PTRM and annual pricing process does intend to deliver an expected real rate of return. However stated that the approach of using a non-market-based inflation forecasts means it is not able to meet the framework's objectives.[126] **Issue 3** Concluded that a hybrid approach should be used. Noted that implicit in the 2017 Inflation Review, is the AER's stance that:[127] • service providers can in fact choose between real and nominal debt; and • the AER's current models and methods deliver compensation commensurate with this. Considered that neither of these views are correct. Stated that it is not clear that service providers can fund themselves with real debt, providing that the issuance of indexed corporate debt in Australia is less than the nominal debt associated with AGIG's three regulated businesses.[128]		
ATCO	Market-based measures	Expected real rate of return delivered but noted issues	Adopt hybrid approach
Comments	Endorsed the submission of ENA[129] **Issue 3** Supported the ENA submission, but stated a hybrid is a first step to a full nominal approach.[130]		

118 APGA, *Submission to discussion paper, inflation review 2020*, July 2020, p. 8.
119 APGA, *Submission to discussion paper, inflation review 2020*, July 2020, p. 10.
120 APGA, *Submission to discussion paper, inflation review 2020*, July 2020, p. 10.
121 APGA, *Submission to discussion paper, inflation review 2020*, July 2020, p. 11.
122 APGA, *Submission to discussion paper, inflation review 2020*, July 2020, p. 11.
123 APGA, *Submission to discussion paper, inflation review 2020*, July 2020, p. 11.
124 APGA, *Submission to discussion paper, inflation review 2020*, July 2020, p. 12.
125 APGA, *Submission to discussion paper, inflation review 2020*, July 2020, p. 12.
126 APGA, *Submission to discussion paper, inflation review 2020*, July 2020, p. 2.
127 APGA, *Submission to discussion paper, inflation review 2020*, July 2020, p. 18-19.
128 APGA, *Submission to discussion paper, inflation review 2020*, July 2020, p. 18-19.
129 ATCO, *Submission to discussion paper, inflation review 2020,* July 2020, p. 1.
130 ATCO, *Submission to discussion paper, inflation review 2020,* July 2020, p. 6.

Submitter	Issue 1	Issue 2	Issue 3
	Submitted that moving to a full nominal approach will lower aggregate network costs for consumers, responds to a changing operating environment and is in the long-term interests of consumers.[131]		
Ausgrid	Market-based measures	Expected real rate of return delivered but noted issues	Adopt hybrid approach
Comments	Endorsed the ENA's submission[132] **Issue 1** Submitted that the assumption that CPI will return to the midpoint of the RBA's band in two years needs to be reconsidered in the current economic environment.[133] Provided RBA commentary to denote that financial market inflation expectations will stay below 2% for both five and ten year terms,[134] and that the AER should give some weight to market implied inflation forecasts, specifically inflation swaps.[135] In relation to the forecast horizon submitted that it is not necessary for the term of debt to be matched to the term of the inflation forecast.[136] Provided that the estimation of the amount to be deducted from the RAB in a period should be aligned with the amount that is to be returned to the RAB in that period, and therefore the estimation horizon or averaging period should alternatively be set to five years.[137] **Issue 2** Noted that there are issues in the logic that any windfall transfers to and from equity when inflation differs from the estimate will offset each other to be NPV in the long-term.[138] These issues are:[139] • the framework delivers a real rate of return, but service providers issue and are required to make interest payments on nominal debt; and • sustained periods of under-compensation to equity, even if NPV neutral, do not align with the realities of financing service providers and continued investment to promote network efficiency Submitted that the NPV neutrality was not an issue from 1999 to 2015 because the under and over estimation of inflation was not severe and was more symmetrical above and below the estimate and the methodology for estimating expected inflation was more closely aligned to market expectations.[140] Noted that the impact 'of this under-recovery in the short to medium-term is that equity holders receive real returns well below the AER's allowance within the regulatory period, and in the absence of outperformance of the benchmark cost allowances would incur a net loss over the five year period.'[141] **Issue 3** Submitted that there is general consensus that real return on equity is most appropriate compensation to network shareholders.[142] Noted however that debt is contracted and paid in nominal terms and 'in the Australian context the link to inflation cannot be managed efficiently through financial instruments because the market for corporate inflation linked debt is effectively non-existent.'[143] Provided that the 'natural conclusion is for debt to be treated according to its underlying characteristic as a nominal cost, and compensation for this cost to be based on the efficient		

131 ATCO, *Submission to discussion paper, inflation review 2020*, July 2020, pp. 6-7.
132 Ausgrid, *Submission to discussion paper, inflation review 2020*, July 2020, p. 1.
133 Ausgrid, *Submission to discussion paper, inflation review 2020*, July 2020, p. 9.
134 Ausgrid, *Submission to discussion paper, inflation review 2020*, July 2020, p. 9.
135 Ausgrid, *Submission to discussion paper, inflation review 2020*, July 2020, p. 9.
136 Ausgrid, *Submission to discussion paper, inflation review 2020*, July 2020, p. 10.
137 Ausgrid, *Submission to discussion paper, inflation review 2020*, July 2020, pp. 10-11.
138 Ausgrid, *Submission to discussion paper, inflation review 2020*, July 2020, p. 2.
139 Ausgrid, *Submission to discussion paper, inflation review 2020*, July 2020, p. 2.
140 Ausgrid, *Submission to discussion paper, inflation review 2020*, July 2020, pp. 2-3.
141 Ausgrid, *Submission to discussion paper, inflation review 2020*, July 2020, p. 4.
142 Ausgrid, *Submission to discussion paper, inflation review 2020*, July 2020, p. 6.
143 Ausgrid, *Submission to discussion paper, inflation review 2020*, July 2020, p. 6.

Submitter	Issue 1	Issue 2	Issue 3
	nominal cost determined by the AER under the rate of return instrument.'[144] Further does not believe that there should be any compensating change in the risk profile accounted for in the rate of return.[145] **Consultant Report** Ausgrid also submitted a consultant report from First Economics as an attachment to its submission. This report supported exploring the use of a hybrid approach,[146] however noted that a transition may be needed.[147] First Economics also suggested that the AER switch to a five-year forecasting horizon to match the length of the regulatory period[148] and that all parties investigate whether inflation swaps could produce more accurate inflation expectations.[149]		
AusNet Services	Market-based measures	Expected real rate of return delivered but noted issues	Adopt hybrid approach
Comments	Endorsed the ENA's submission[150] **Issue 1** Submitted that there is a material and growing gap between inflation expectations indicated by market data and the RBA's inflation target band. Noted that implementing a glide-path will be not enough to resolve this mismatch as it is influenced by the midpoint of the RBA's target band.[151] Noted that market data should form the basis of inflation estimates – using either inflation swaps, or the bond break-even approach,[152] as they are the most relevant and credible alternative data sources.[153] Provided that this is not controversial, radical or difficult to implement and used by Ofgem, ERA and the AER itself prior to 2008.[154] **Issue 2** Submitted that to reduce volatility in revenues and price a hybrid framework should be adopted to reduce the mismatch between consumer prices and the efficient costs of service providers.[155] Provided that moving to a hybrid framework will not impact consumer prices either immediately or over the long-term,[156] as if expected inflation is set using an unbiased forecast, deviations between expected and actual inflation will be symmetrical over time.[157]		
CitiPower, Powercor & United Energy	Market-based measures	Expected real rate of return delivered but noted issues	Adopt hybrid approach
Comments	Endorsed the ENA's submission[158]		
ENA	Market-based measures	Expected real rate of return delivered but noted issues	Adopt hybrid approach
Comments	Issue 1		

144 Ausgrid, *Submission to discussion paper, inflation review 2020*, July 2020, p. 7.
145 Ausgrid, *Submission to discussion paper, inflation review 2020*, July 2020, pp. 7-8.
146 First Economics, *The AER's Inflation Review – A report prepared for Ausgrid*, June 2020, pp. 10-11.
147 First Economics, *The AER's Inflation Review – A report prepared for Ausgrid*, June 2020, p. 16.
148 First Economics, *The AER's Inflation Review – A report prepared for Ausgrid*, June 2020, p. 16.
149 First Economics, *The AER's Inflation Review – A report prepared for Ausgrid*, June 2020, p. 16.
150 AusNet Services, *Submission to discussion paper, inflation review 2020*, July 2020, p. 5.
151 AusNet Services, *Submission to discussion paper, inflation review 2020*, July 2020, p. 3.
152 AusNet Services, *Submission to discussion paper, inflation review 2020*, July 2020, p. 3.
153 AusNet Services, *Submission to discussion paper, inflation review 2020*, July 2020, p. 3.
154 AusNet Services, *Submission to discussion paper, inflation review 2020*, July 2020, p. 3.
155 AusNet Services, *Submission to discussion paper, inflation review 2020*, July 2020, p. 3.
156 AusNet Services, *Submission to discussion paper, inflation review 2020*, July 2020, p. 4.
157 AusNet Services, *Submission to discussion paper, inflation review 2020*, July 2020, p. 4.
158 CitiPower, Powercor and United Energy, *Submission to discussion paper, inflation review 2020*, July 2020, p. 1.

Submitter	Issue 1	Issue 2	Issue 3

Submitted that a problem arises when the AER's estimate of expected inflation differs from the market's inflation expectations.[159] Noted that the AER's estimate of the required real return will differ to what is required by investors and that the gap between RBA forecasts and the target range has widened.[160]

Stated that the assumption in our current method that inflation is expected to be 2.5 per cent in year 3 (FY23) and every year thereafter is unreasonable.[161] As an alternative, market-based measures are appropriate for regulatory purposes because they exactly replicate the treatment of inflation in the AER's regulatory models.[162]

Noted the advantage of market-based measures, and in particular inflation swaps, is that the prices are set by sophisticated market participants where there is real money at stake and therefore a strong incentive for the parties to adopt a reasonable estimate of inflation.[163] Provided RBA commentary that 'these measures are useful for a number of reasons. First, market participants have substantial financial resources at stake. This means that they have strong and direct incentives to form accurate expectations for inflation and, as a result, are likely to be well informed.[164]

Addressed our assessment of inflation swaps from our 2017 Inflation Review, that the estimates are likely to incorporate biases and distortions that are likely time varying, are probably "unviable" and that service providers may engage in trading of inflation swaps if used as a method. Noted that any possible biases may result in the swaps being overstated, viability needs to be considered relative to alternative methods, and the risk of service providers trading inflation swaps is either minimal or could be minimised.[165]

Provided that in using market-based measures, one of the measures should not be used mechanically, as the break-even approach is also noted in the submission as a potential option with adjustments to remove any issues from the liquidity premium.[166] Submitted that regard should be had for all relevant evidence, in light of the relative strengths and weaknesses, and in the prevailing market conditions, market-based measures should receive material weight by the AER.[167]

Issue 2

Noted that the current approach delivers the target ex-ante expected real rate of return. However noted this is wrong in two respects:[168]

- the benchmark efficient return on debt is a nominal return, in which case it is wrong to target a real allowance.
- for the return on equity, the AER's targeted real return is manifestly too low because the AER has deducted an unreasonably high estimate of expected inflation.

Issue 3

Submitted that a hybrid approach should be used to overcome 'the debt allowance problem.'[169] Noted that a prudent and efficient service provider issues nominal debt and is contractually required to make nominal interest payments; and that our regulatory allowance does not match the efficient costs that the benchmark efficient network is contractually required to pay.[170]

Stated that the solution is to match the regulatory allowance the efficient costs that the benchmark entity is contractually required to pay.[171] In assessing the change to the regulatory framework, noted that consumers should only be asked to pay the benchmark efficient cost of providing the

159 ENA, *Submission to discussion paper, inflation review 2020*, July 2020, p. 34.
160 ENA, *Submission to discussion paper, inflation review 2020*, July 2020, p. 34.
161 ENA, *Submission to discussion paper, inflation review 2020*, July 2020, p. 34.
162 ENA, *Submission to discussion paper, inflation review 2020*, July 2020, p. 34.
163 ENA, *Submission to discussion paper, inflation review 2020*, July 2020, p. 43.
164 ENA, *Submission to discussion paper, inflation review 2020*, July 2020, p. 43.
165 ENA, *Submission to discussion paper, inflation review 2020*, July 2020, pp. 45-48.
166 ENA, *Submission to discussion paper, inflation review 2020*, July 2020, pp. 48-49.
167 ENA, *Submission to discussion paper, inflation review 2020*, July 2020, pp. 50-51.
168 ENA, *Submission to discussion paper, inflation review 2020*, July 2020, p. 88.
169 ENA, *Submission to discussion paper, inflation review 2020*, July 2020, pp. 18-33.
170 ENA, *Submission to discussion paper, inflation review 2020*, July 2020, p. 18.
171 ENA, *Submission to discussion paper, inflation review 2020*, July 2020, p. 24.

Submitter	Issue 1	Issue 2	Issue 3
	service.[172] Under the current approach stated that there is no clear basis for determining which generation of consumers will under-pay and which will over-pay.[173] **Consultant Report** ENA also submitted a consultant's report from Competition Economics Group (CEG) as an attachment to its submission. This reported provided conclusions that accorded with the ENA's submission.[174] These conclusions were that debt and equity are treated differently in the rate of return instrument and have 'different inflation compensation built into their nominal values.'[175] This is based on equity being incurred at a real cost and debt being incurred at a nominal cost.[176]		
Endeavour Energy	Market-based measures	Expected real rate of return delivered but noted issues	Adopt hybrid approach
Comments	Endorsed the ENA's submission.[177]		
Energy Queensland	Market-based measures	Expected real rate of return delivered but noted issues	Adopt hybrid approach
Comments	Endorsed the ENA's submission.[178]		
SA Power Networks	Market-based measures	Expected real rate of return delivered but noted issues	Adopt hybrid approach
Comments	Endorsed the ENA's submission.[179]		
TransGrid	Market-based measures	Expected real rate of return delivered but noted issues	Adopt hybrid approach
Comments	Endorsed the ENA's submission.[180]		
Other			
Aurizon	Market-based measures	No comment	Suggested an alternative hybrid approach
Comments	**Issue 1** Submitted that the AER should consider an alternative 'hybrid' approach to estimating expected inflation, rather than the current approach of short-term forecasts and the long-term inflation target.[181] Suggested the AER test the reliability of medium-term estimates of expected inflation having regard to the liquidity of inflation–linked bonds and the recent assessment of these bonds by IPART and the ERA.[182] Assessed that the RBA's second year forecasts used in the current approach are 'consistently overestimating forecast inflation and that the cumulative error is significant,' noting unbiased inflation estimates would require the cumulative error to be zero.[183] Noted that the reliability of the		

172 ENA, *Submission to discussion paper, inflation review 2020*, July 2020, p. 24.
173 ENA, *Submission to discussion paper, inflation review 2020*, July 2020, pp. 24-25.
174 Competition Economists Group, *Delivering meaningful real returns via the PTRM, RoRI and RFM*, July 2020, p. 1.
175 Competition Economists Group, *Delivering meaningful real returns via the PTRM, RoRI and RFM*, July 2020, p. 1.
176 Competition Economists Group, *Delivering meaningful real returns via the PTRM, RoRI and RFM*, July 2020, p. 1.
177 Endeavour Energy, *Submission to discussion paper, inflation review 2020*, July 2020, p. 1.
178 Energy Queensland, *Submission to discussion paper, inflation review 2020*, July 2020, p. 1.
179 SA Power Networks, *Submission to discussion paper, inflation review 2020*, July 2020, p. 1.
180 TransGrid, *Submission to discussion paper, inflation review 2020*, July 2020, p. 1.
181 Aurizon, *Submission to discussion paper, inflation review 2020*, July 2020, pp. 3-4.
182 Aurizon, *Submission to discussion paper, inflation review 2020*, July 2020, pp. 3-4.
183 Aurizon, *Submission to discussion paper, inflation review 2020*, July 2020, p. 5.

Submitter	Issue 1	Issue 2	Issue 3
	RBA's forecasts call into question the underlying assumption that inflation reverts to the mid-point of the RBA's target band by year 3.[184] Considered whether long-term expectations are still anchored at 2.5 per cent, and concluded that the longer-term inflation expectations are also likely to be lower than the mid-point of the RBA's target band.[185] **Issue 2** Provided the regulatory models used in their regulatory decisions (for rail) as an option for a hybrid.[186] Noted that the inflation forecast risk is retained by the regulated business and that their hybrid model may be simpler to implement than the split RAB scenario presented in the discussion paper.[187]		
CitiGroup	No comment	Noted the impact of actual and estimated inflation on the real rate of return	Adopt hybrid approach
Comments	**Issue 2** Stated that a sustained deviation between expected and annual inflation will deviate from the NPV neutrality framework, noting it is 'undesirable as it elevates the risk profile given the revenue allowance is neither inflation-linked nor providing the correct theoretical rate of return.'[188] Noted that the elevated risk profile potentially creates a disincentive for investors and lenders to deploy capital into service providers, which could prevent efficient investment into critical infrastructure projects.[189] **Issue 3** Supported stakeholder submissions who proposed the use of a hybrid approach as a method to solve the error.[190]		
Network Shareholder Group	Market-based measures	Expected real rate of return delivered but noted issues	Adopt hybrid approach
Comments	Relies on the ENA's submission.[191]		
QTC	Market-based measures	Expected real rate of return is materially biased downwards	Adopt hybrid approach
Comments	**Issue 1** Submitted that the AER should not continue with its current approach, as the transition to the current method was based on liquidity issues in the real Commonwealth Government Securities market, which have not been prevalent for the last five years.[192] Further the current approach is producing excessive revenue deductions for inflation on the RAB, which results in the large negative net profit after tax occurring in the PTRM.[193] Supported the use of market-based measures for estimating expected inflation under a hybrid approach.[194] This will ensure that any inflation risk premium in the nominal allowed return on equity has no net effect on the real return on equity allowance in the PTRM and eliminates the		

184 Aurizon, *Submission to discussion paper, inflation review 2020*, July 2020, p. 6.
185 Aurizon, *Submission to discussion paper, inflation review 2020*, July 2020, pp. 8-11.
186 Aurizon, *Submission to discussion paper, inflation review 2020*, July 2020, pp. 11-12.
187 Aurizon, *Submission to discussion paper, inflation review 2020*, July 2020, p. 12.
188 CitiGroup, *Submission to discussion paper, inflation review 2020*, July 2020, p. 8.
189 CitiGroup, *Submission to discussion paper, inflation review 2020*, July 2020, p. 8.
190 CitiGroup, *Submission to discussion paper, inflation review 2020*, July 2020, p. 1.
191 Network Shareholder Group, *Submission to discussion paper, inflation review 2020*, July 2020, p. 2.
192 QTC, *Submission to discussion paper, inflation review 2020*, July 2020, p. 15.
193 QTC, *Submission to discussion paper, inflation review 2020*, July 2020, p. 15.
194 QTC, *Submission to discussion paper, inflation review 2020*, July 2020, p. 15.

Submitter	Issue 1	Issue 2	Issue 3
	need for the AER to consider a glide-path approach, which is a complex and contentious alternative.[195]		
Spark Infrastructure	Market-based measures	No. Changes are needed to remove the inflation from nominal cost of debt or equity or the RAB indexation.	Adopt hybrid approach

Comments

Supported the ENA's submission.[196]

Issue 1

Submitted that since the 2017 Inflation Review inflation has continued to fall, the RBA has revised downwards its estimates of inflation and sought to review its method for forecasting inflation, and market expectations of inflation have significantly reduced.[197] Noted that the AER's methodology is not a forecast of expectations of inflation either, as the mid-point of the RBA's target band is not a forecast or objective.[198] Noted that the RBA's target band is no longer a reasonable proxy for longer term expectations of inflation.[199]

Noted that the current pandemic has 'led to unprecedented low bond rates, low inflation (and deflation followed by lower for longer inflation) and low expectations of economic growth.'[200] Cited a recent AFR article, which stated that:[201]

- Market expectations of inflation are that inflation will not return to the RBA's target band for a decade.
- Australian break-even rates, a market-based measure of inflation expectation, has five-year break-even rates sitting at 0.774 per cent, while 10 year break-even is at 1.231 per cent.

Noted that the difference between these amounts and the AER's forecast of 2.27% is not small and a material difference,[202] which effects the return on equity for service providers and would be costly for service providers to hedge the inflation risk.[203]

Summarised that a hybrid approach should be used for the debt portion of the RAB and the inflation estimate for the equity portion of the RAB should have a strong congruence to market expectations.[204]

Issue 2

Submitted that the expected real rate of return has not been delivered. Noted that the PTRM needs to remove either from the nominal cost of debt and equity:[205]

- the inflation embedded in the nominal cost of equity and/or debt
- the inflation expectation that is expected to be provided via revenue and RAB RFM indexation over the regulatory period.

Provided that even if 'inflation exactly matches the inflation assumed by the AER in the five-year regulatory period, the nominal compensation for debt will be higher or lower than the nominal cost of debt depending on whether the AER's forecast of inflation is lower or higher.'[206] Noted that the

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195 QTC, *Submission to discussion paper, inflation review 2020*, July 2020, p. 15.
196 Spark Infrastructure, *Submission to discussion paper, inflation review 2020*, July 2020, p. 4.
197 Spark Infrastructure, *Submission to discussion paper, inflation review 2020*, July 2020, p. 5.
198 Spark Infrastructure, *Submission to discussion paper, inflation review 2020*, July 2020, p. 6.
199 Spark Infrastructure, *Submission to discussion paper, inflation review 2020*, July 2020, p. 6.
200 Spark Infrastructure, *Submission to discussion paper, inflation review 2020*, July 2020, pp. 6-7.
201 Spark Infrastructure, *Submission to discussion paper, inflation review 2020*, July 2020, p. 7.
202 Spark Infrastructure, *Submission to discussion paper, inflation review 2020*, July 2020, p. 7.
203 Spark Infrastructure, *Submission to discussion paper, inflation review 2020*, July 2020, p. 7.
204 Spark Infrastructure, *Submission to discussion paper, inflation review 2020*, July 2020, p. 11.
205 Spark Infrastructure, *Submission to discussion paper, inflation review 2020*, July 2020, p. 11.
206 Spark Infrastructure, *Submission to discussion paper, inflation review 2020*, July 2020, pp. 11-12.

Submitter	Issue 1	Issue 2	Issue 3

residual compensation for equity holders will not match the targeted cost of equity (in neither real nor nominal terms).[207]

Issue 3

Submitted that whether or not a real, nominal or hybrid return is targeted should not be the scope of the Inflation Review.[208]

Provided that the 'nominal return of debt is estimated by assuming that the efficient cost of debt is incurred by re-contracting for one tenth of debt in each year of the regulatory period in nominal terms.'[209] Noted that the nominal return on debt can only be maintained by ensuring that the roll-forward of the debt component of the RAB occurs using the same inflation applied in estimating the nominal return on debt.[210]

Noted that for equity, for the CAPM to be internally consistent it must be specified purely in real terms.[211] Due to this the nominal cost of equity can only be used in the PTRM if all inflation compensation built into the nominal risk-free rate is removed.[212]

Consultant Report

Spark Infrastructure also included a consultant's report from CEG in its submission, which provided a response to a series of questions.[213] CEG noted when answering these questions, that the rate of return instrument estimates a nominal return on debt and a real return on equity,[214] and that the PTRM inflation does not meet its objectives in determining a real rate of return.[215]

CEG's report also noted that in improving the accuracy of the compensation for service providers' debt costs reduces the risk for all stakeholders,[216] and that the current regime does not protect consumers from inflation risk, but rather does the opposite.[217] This submission also noted that the NEO/NGO and revenue and pricing principles are best served 'if the regime provides a level of compensation for debt and equity returns that is as accurate as possible in terms of reflecting the efficient risk adjusted costs of that funding.'[218]

CEG's report also included attachments which provided:

- Commentary on Lally's report that PTRM inflation should be five years. CEG noted support in relation to cost of debt, but not equity as it is a real cost.[219] Alternatively, the PTRM inflation applied to equity should be estimated over the same horizon as the risk-free rate (10 years)[220]
- The historical context for the trailing average cost of debt, and how it was based on the rationale that it reflected efficient debt funding practices for service providers.[221]
- The performance of the current inflation approach against market measures in forecasting actual inflation.[222]

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207 Spark Infrastructure, *Submission to discussion paper, inflation review 2020*, July 2020, p. 12.
208 Spark Infrastructure, *Submission to discussion paper, inflation review 2020*, July 2020, p. 12.
209 Spark Infrastructure, *Submission to discussion paper, inflation review 2020*, July 2020, p. 12.
210 Spark Infrastructure, *Submission to discussion paper, inflation review 2020*, July 2020, p. 12.
211 Spark Infrastructure, *Submission to discussion paper, inflation review 2020*, July 2020, p. 12.
212 Spark Infrastructure, *Submission to discussion paper, inflation review 2020*, July 2020, p. 12.
213 Spark Infrastructure, *Submission to discussion paper, inflation review 2020*, July 2020, Attachment B, pp. 1-2.
214 Spark Infrastructure, *Submission to discussion paper, inflation review 2020*, July 2020, Attachment B, pp. 8-10.
215 Spark Infrastructure, *Submission to discussion paper, inflation review 2020*, July 2020, Attachment B, pp. 11-15.
216 Spark Infrastructure, *Submission to discussion paper, inflation review 2020*, July 2020, Attachment B, pp. 15-16.
217 Spark Infrastructure, *Submission to discussion paper, inflation review 2020*, July 2020, Attachment B, p. 15.
218 Spark Infrastructure, *Submission to discussion paper, inflation review 2020*, July 2020, Attachment B, p. 17.
219 Spark Infrastructure, *Submission to discussion paper, inflation review 2020*, July 2020, Attachment B, p. 19.
220 Spark Infrastructure, *Submission to discussion paper, inflation review 2020*, July 2020, Attachment B, p. 19.
221 Spark Infrastructure, *Submission to discussion paper, inflation review 2020*, July 2020, Attachment B, pp. 25-26.
222 Spark Infrastructure, *Submission to discussion paper, inflation review 2020*, July 2020, Attachment B, pp. 27-28.

10 What is the best inflation term to use in our decisions?

This section sets out our analysis of options relating to the term over which we estimate expected inflation. In particular, we have considered the choice of term between:

- 10 years (current approach)—Matching the inflation estimate term with the term of the rate of return estimate
- Length of the regulatory period (new approach)—Matching the regulatory period and the term over which the estimated expected inflation rates are reset — typically every 5 years.

Our draft position is to change to an inflation term matching the length of the regulatory period. In our view, both approaches have advantages and disadvantages. We consider either could be valid and reasonable. On balance, we consider that an inflation term tied to the length of the regulatory period is likely to achieve the NEO/NGO to the greatest degree. Our draft position has been formed on the basis of the material available to us at this time. The potential implications of this change have not been fully explored in the submissions provided so far, and this is a key area where we would like to hear more from stakeholders in finalising our position. In particular, we would like to hear about potential impacts on the interests of consumers.

We also recognise that making this change in approach may have implications for the 2022 rate of return instrument review. This is a point we outline further in our discussion about whether a transition is needed in chapter 15.[223]

10.1 Current approach—10 year term

Our current approach is to estimate inflation using a 10 year geometric annualised average of the RBA's headline rate forecasts for 1 and 2 years ahead[224] and the mid-point of the RBA's target inflation band of 2 to 3 per cent for years 3 to 10. We commenced this approach in 2008 and have applied it consistently since then. Previously, we had estimated inflation over 10 years to match the term of the allowed rate of return but had used a bond break-even based approach.[225]

The key advantage of a 10 year inflation term is that this matches the term we use to estimate the rate of return. Investors' expectations of inflation are embedded in the

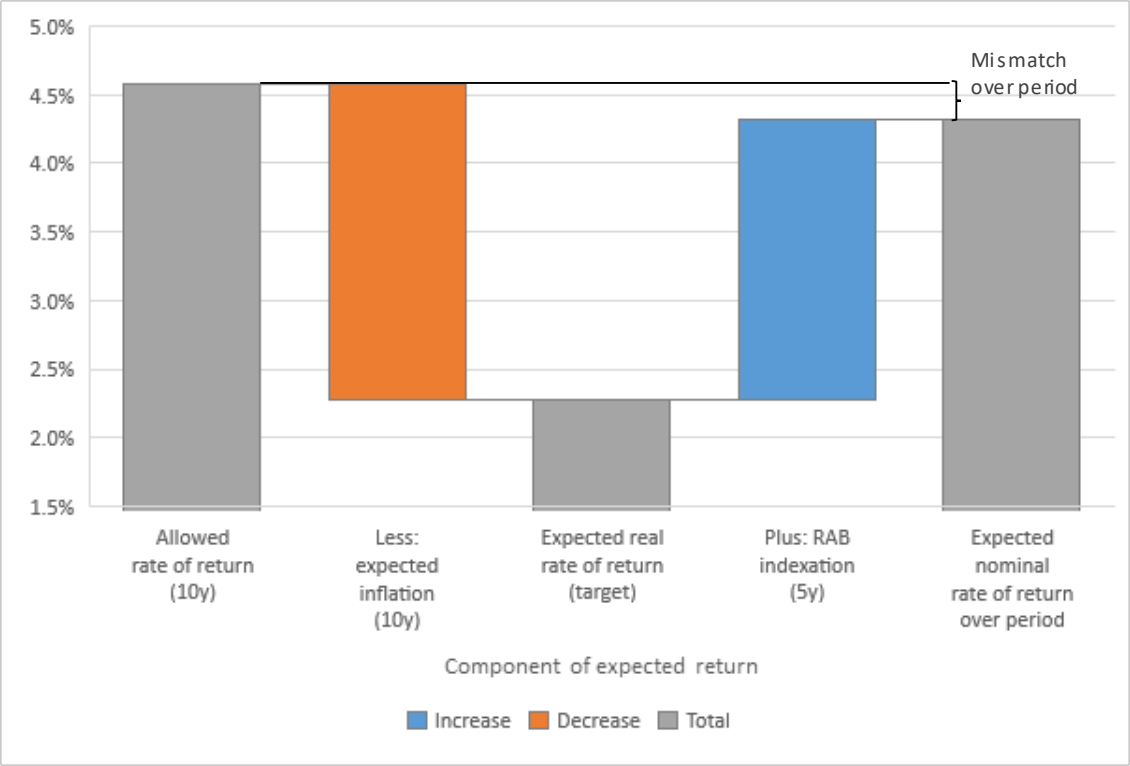
[223] For details on the AER's 2022 Rate of return instrument see: https://www.aer.gov.au/publications/guidelines-schemes-models/rate-of-return-instrument-2022

[224] Where the RBA forecast headline inflation rates for 1 and 2 years ahead is a range, the midpoint of the range is used.

nominal returns that we estimate. As such, it is desirable to estimate both the rates of return and inflation over a common time-term.

In contrast, service providers' revenue is reset in revenue determinations which typically occur every 5 years. As such, our current approach can result in the expected inflation removed from the nominal return and not matching the RAB indexation over the regulatory period. This is illustrated in Figure 4.

Figure 4 Mismatch between 10 year expected inflation and 5 year RAB indexation over period.



Over the longer-term our current approach will result in unbiased and correct outcomes because in the long-run we consider expected inflation remains anchored to the mid-point of the RBA target band.[226] As a result, on average in the long-run, and for all future regulatory periods, there is no expected mismatch. Further, to the extent there is a mismatch risk that affects cash flows it is compensated in our allowed returns on equity. However, our approach does not necessarily lead to the best measure of inflation during a single regulatory control period. To that end, we have considered an approach that matches the inflation term and the length of the regulatory period.

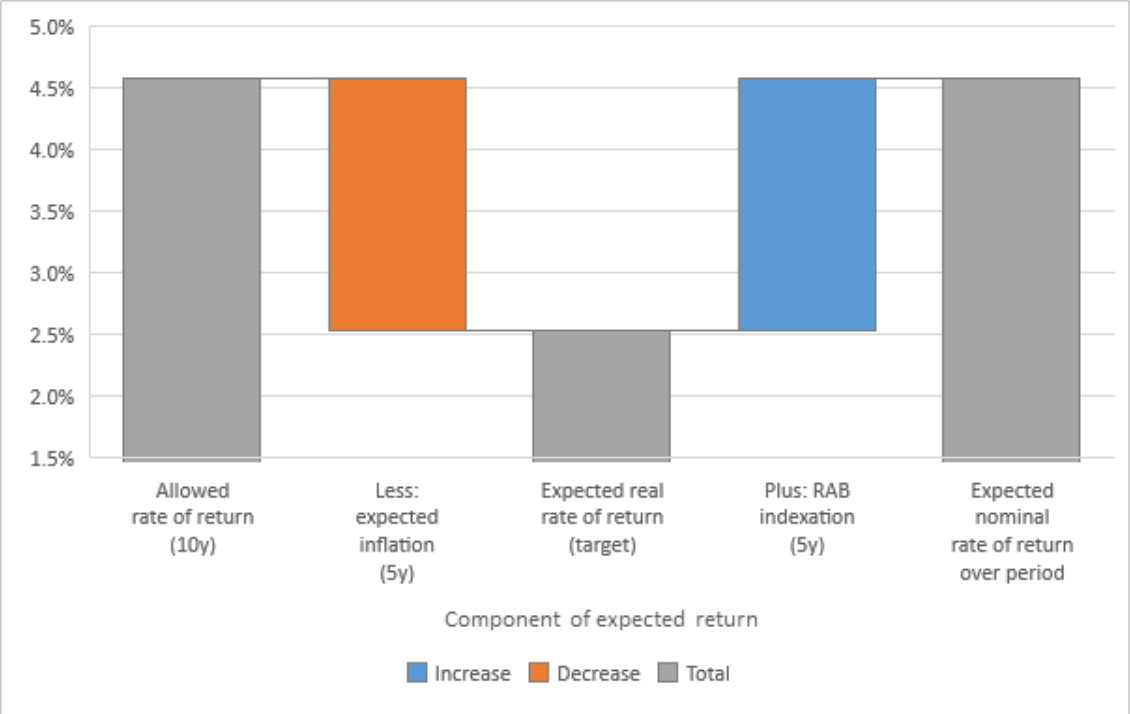
[226] Deloitte Access Economics, *Review of the regulatory treatment of inflation*, 30 June 2020, pp. 6-8.

10.2 New approach — term length to match regulatory period

Having regard to the advice from Dr Lally and submissions on our discussion paper, we have reached the view that an inflation term matching the regulatory period is likely to result in the best estimates of expected inflation. In particular, we consider that:

- Adopting an inflation term that is the same length as the relevant regulatory period (typically, 5 years) would, in expectation match RAB indexation over the regulatory period. This is desirable because service providers will in expectation receive the same allowance during RAB indexation in the RFM as the amount (expected inflation) deducted from total revenue in the PTRM. Thus, service providers are expected to receive the nominal return set in the rate of return instrument over the regulatory period. This is illustrated in Figure 5.
- Use of an inflation term matching the length of the regulatory period is more responsive to changes in current market circumstances. This increases the extent to which our approach depends on specific RBA forecasts and diminishes reliance on the assumption that investors anchor expectations to the mid-point of the RBA's target band in the long-term. While we consider the evidence continues to support anchoring, we consider there is a benefit of using a term matching the length of the regulatory period.

Figure 5 Matching expected inflation term with regulatory period



At this time, it is not clear to us that the term for the inflation expectations needs to be aligned to that used for the determination of the rate of return. We acknowledge the arguments that Dr Lally made for this and note that this issue has been raised in past reviews of rate of return by regulators. If the question of whether the term of the rate of

return should also be aligned to the regulatory period is to be explored, we consider it should be through the current rate of return instrument review. We are seeking submissions on this point to inform our final position.

11 What are the best indicators of expected inflation?

Having regard to the available evidence, our view is that investors' expectations remain anchored to the mid-point of the RBA target band in the longer-term. That is, we consider the evidence supports a position that investors expect inflation should eventually return to 2.5 per cent. This is consistent with our findings in the last inflation review.

Nonetheless, we recognise that there are a range of reasonable conclusions that could be reached on how quickly investors expect inflation to return to that point.

There are a number different indicators of expected inflation. We outline these below, together with our reasons for why we consider the RBA's short-term forecasts and mid-point of its target band remain the best indicator of expected inflation.

11.1 Using RBA forecasts and mid-point of band

Our consultants (Deloitte[227] and Dr Lally[228]) and the CRG,[229] in its submission to our discussion paper, supported the use of RBA forecasts in the short-term and the mid-point of the target band in estimating inflation expectations. The CRG noted that there was limited evidence that long-term expectations have shifted in a material way. They also noted that Consensus Economics surveys continued to indicate long-term expected inflation anchored to the RBA target band, and that RBA commentary continued to confirm that longer-term expectations remain within the RBA target band.[230]

Submissions from Public Interest Advocacy Centre, Energy Users Association of Australia and Major Energy Users also supported the continued use of RBA forecasts and the mid-point of the target band in estimating inflation expectations.[231] None of these parties consider there is a better estimate of short-term and long-term inflation expectations.

Both Deloitte and Dr Lally also found that RBA forecasts are the best estimate of short-term inflation expectations, and that long-term inflation expectations remain well anchored at 2.5 per cent. They attributed the RBA's superior forecasts in the short-term to the fact that the RBA possess information that is not necessarily publicly

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227 Deloitte Access Economics, *Review of the regulatory treatment of inflation*, 30 June 2020, p. 8.

228 Dr Martin Lally, Capital Financial Consultants, *Review of the AER's inflation forecasting methodology*, 8 July 2020, p. 3.

229 CRG, *Submission discussion paper, inflation review 2020*, July 2020, pp. 23-24

230 CRG, *Submission discussion paper, inflation review 2020*, July 2020, pp. 23-24.

231 PIAC, *Submission to discussion paper, inflation review 2020*, July 2020, p. 1; EUAA, *Submission to discussion paper, inflation review 2020*, July 2020, p. 2 and MEU, *Submission to discussion paper, inflation review 2020*, July 2020, p. 9.

available,[232] with Deloitte noting that the RBA forecasts of CPI are relatively accurate and have substantial explanatory power.[233]

Deloitte's report did not identify any evidence that indicates long-term inflation expectations have de-anchored from 2.5 per cent. Similarly, Dr Lally noted that the RBA is highly respected and has been generally successful in its inflation targeting, and for the calendar year 1994-2019, the arithmetic average of the annual inflation rates was 2.49 per cent.[234]

As such, we consider that the RBA forecasts remain the best estimates of short-term expected inflation, and that long-term expected inflation remains anchored at the mid-point of the RBA's target band. They are congruent with the market's inflation expectations and remain robust. On this basis, our draft position is to continue to use an approach based on the RBA's short-term forecasts—for the longest term published by the RBA—and a longer term estimate based on the mid-point of the target band. That is, we would use the RBA's short-term forecasts in preference to other approaches used in this paper in setting our estimate of expected inflation.

Finally, we note that we have not proposed defining the form of inflation forecast we will use from the RBA's Statement on Monetary Policy. While we consider CPI will generally be used and it is the measure used to escalate the regulatory asset base, in exceptional circumstances it may be appropriate to use trimmed mean inflation (TMI) forecasts from the RBA. As noted earlier, TMI was used for our recent determinations due to the exceptional circumstances at the time. However, it may be preferable to specify that we will use the RBA's forecasts of CPI rather than any other measure. Specifying CPI would mean that the forecast used in our estimate aligns with the measure we use to escalate the RAB. We are interested in stakeholders' views on this point.

11.2 Would it be better to use surveys?

Currently, we use Consensus Economics survey data as a check on the reliability and market congruence of our approach to estimating expected inflation. We will continue to do this in the future, even if there is a change in approach to estimating expected inflation.

Deloitte noted that surveys rank highly in terms of relative congruence as professional forecasters invest substantial time and effort to ensure that their models track relevant changes in information relating to the formation of inflation expectations.[235] While

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232 Deloitte Access Economics, *Review of the regulatory treatment of inflation*, 30 June 2020, pp. 6-8; Dr Martin Lally, Capital Financial Consultants, *Review of the AER's inflation forecasting methodology*, 8 July 2020, p. 3.

233 Deloitte Access Economics, *Review of the regulatory treatment of inflation*, 30 June 2020, p. 21.

234 Dr Martin Lally, Capital Financial Consultants, *Review of the AER's inflation forecasting methodology*, 8 July 2020, p. 25.

235 Deloitte Access Economics, *Review of the regulatory treatment of inflation*, 30 June 2020, p. 7.

surveys are useful for monitoring, we consider that they are not fit-for-purpose to use as the primary estimate because:

- The available inflation expectation surveys are either for too short a duration or are proprietary. As noted by Deloitte, this limits both the transparency and replicability of the survey approach, and thus was ranked 'poor' for these principles.[236]
- Short-term surveys are already considered by the RBA and information from them should be in the first two years' forecasts under the current approach. Dr Lally stated that the RBA's forecast would outperform Consensus Economics' surveys, because the RBA has insights into drivers of inflation fluctuations that those surveyed do not have.[237]

Having regard to the other factors relevant to achieving the NEO and NGO, the use of surveys relies on access to commercial in confidence data, and therefore poses issues for transparency and replicability. While these factors rank below relative congruence and robustness in their importance, surveys do not rank any better than the current method.

11.3 Would it be better to use market measures of inflation?

Another option raised in submissions is to rely on market data (inflation swaps or the bond break-even approach) to estimate expected inflation. We refer to these approaches collectively as 'market-based' approaches.

The ENA proposed that material weighting be given to market-based measures.[238] The ENA's proposal was endorsed in thirteen submissions from service providers, industry and investor groups.[239]

However, concerns about the use and limitations of market-based measures were raised in submissions from CRG and MEU.[240] Based on the information raised in submissions, we consider that market-based measures are subject to biases, distortions or volatility that make them unsuitable for our purposes.

In the following sections we elaborate on our analysis of the available market-based approaches, including:

- swaps
- bond break-even

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236 Deloitte Access Economics, *Review of regulatory treatment of inflation*, June 2020, p. 37.

237 Dr Martin Lally, Capital Financial Consultants, *Review of the AER's inflation forecasting methodology*, 8 July 2020, p. 25.

238 ENA, *Submission to discussion paper, inflation review 2020*, July 2020, p. 9.

239 ENA, *Submission to discussion paper, inflation review 2020*, July 2020, p. 9.

240 CRG, *Submission to discussion paper, inflation review 2020*, July 2020, p. 22; MEU, *Submission to discussion paper, inflation review 2020*, July 2020, p. 7

- a weighted-average of market-based measures.

11.3.1 Swaps

We are not persuaded that the swaps method[241] would likely result in the best estimate of expected inflation as it is likely to incorporate biases and distortions (due to hedging costs, liquidity premium and other premiums) that are likely to be time varying.

The swaps method does have some positive attributes. It uses readily available market data, and is simple to calculate. However, whilst the biases are arguably smaller than the bond break-even approach, they are likely to be material. We outline the issues with swaps, as included in our 2017 inflation review in table H.1 of appendix H. These findings were based on an ACCC/AER working paper developed for the 2017 review.[242]

Deloitte and Dr Lally re-examined the swaps approach in their respective reports, concluding that the issues with the swaps method remain and are substantial. Deloitte and Dr Lally respectively stated that:

- market-based measures were affected by the presence of material and time varying distortions that limit their use in a regulatory context;[243] and
- market prices (comprising the break-even rates and swap prices) are likely to be biased estimates of expected future inflation and time varying.[244]

None of the stakeholders that proposed the adoption of swaps (or other market-based measures) provided any new evidence or modelling that demonstrates that market-based measures are less affected by the biases or distortions of volatility than determined in the 2017 inflation review.

The ENA noted 'swaps reflect the prices set by sophisticated market participants where there is real money at stake and therefore a strong incentive for the parties to adopt a reasonable estimate of inflation.'[245] Whilst the ENA is correct that there is real money at stake for swaps, it does not address the biases and distortions outlined above.[246]

Furthermore, the volatility of swaps noted in the 2017 inflation review, has increased since the outbreak of COVID-19. In the RBA's August 2020 Statement on Monetary

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241 A swaps contract is an agreement between two parties to swap one set of pre-defined future payments for a different pre-defined set over an agreed period. For an inflation swap, a fixed payment is exchanged for a variable payment linked to a measure of inflation, such as the retail prices index.

242 See ACCC/AER Working Paper #11, *Consideration of best estimates of expected inflation: comparing and ranking approaches*, April 2017.

243 Deloitte Access Economics, *Review of the regulatory treatment of inflation*, 30 June 2020, pp. 7-10.

244 Dr Martin Lally, Capital Financial Consultants, *Review of the AER's inflation forecasting methodology*, 8 July 2020, pp. 31-32.

245 ENA, *Submission to discussion paper, inflation review 2020*, July 2020, p. 50.

246 Deloitte Access Economics (2020), *Review of the regulatory treatment of inflation,* 30 June. For a survey of premia, biases and distortions in market-based measures see also Hayden Mathysen (2017), *Best Estimates of Expected Inflation: comparative assessment of four methods*, ACCC/AER Working Paper Series, No. 11.

Policy, the RBA noted that short and long-term market-based measures of inflation expectations have declined since the outbreak of the pandemic in early 2020. The RBA noted that these measures have been significantly affected by dysfunction in these markets in the months following the initial shock of COVID-19.[247]

The RBA's commentary reinforces the concerns raised about swaps in the 2017 review. As long as these biases remain material and unquantified, we do not consider it suitable to use swaps as a measure of inflation because it would not provide the best estimate of expected inflation and therefore, would not be in the long-term interests of consumers.

11.3.2 Bond break-even

Similar to swaps, the bond break-even approach is likely to suffer from biases and distortions that are significant and time-varying (see table H.2 in appendix H). These limitations of the bond break-even approach were first raised by SP AusNet in 2007 (see section 7.1). They were important factors contributing to our change from a bond break-even approach to our current approach.

- There is evidence of significant and time varying premiums and biases in bond break-even inflation rates (BBIRs) for the US and UK markets (more mature and liquid than the Australian market) – as well as for the Australian market.
- BBIR estimates may vary considerably depending on the chosen yield curve models (and there is no consensus in the literature on which model should be used).
- There is evidence that long-term inflation expectations are relatively stable and are anchored within the RBA inflation target band.
- If adjustments are made for the above issues the methodology becomes complex and opaque.

In its report to Ausgrid, First Economics,[248] warned against readoption of the BBIR on the basis of similar findings in the UK market. First Economics found that distortions in the supply and demand render the UK BBIR 'meaningless'.

Out of the submissions received, only the Queensland Treasury Corporation (QTC) attempted to address the issues with the BBIR. QTC submitted that the spread between the inflation swaps and the bond break-even approach can provide a correction for the liquidity premia on indexed Commonwealth Government Securities. It submitted that such a correction could be employed to adjust the implied real yields when using the bond break-even approach as an estimate of inflation in the PTRM. However, QTC has not provided evidence that all the other biases, premia and distortions that are observed/estimated in these markets aside from the liquidity premia

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247 RBA, *Statement on Monetary Policy - August 2020 - Inflation*, August 2020, p. 86.

248 First Economics, *The AER's Inflation Review A report prepared for Ausgrid*, June 2020.

are negligible. Even if these other premia, biases and distortions are negligible, the potential time variation of liquidity premia presents problems for its estimation.

Further, our independent experts and the RBA[249] noted issues with the bond break-even approach. Significant and time-varying premiums and biases in the BBIR are still evident. Hence, we consider that the BBIR would not provide the best estimate of expected inflation and would not be in the long-term interests of consumers.

11.3.3 Weighted approach to market-based measures

Beyond considering the market-based approaches individually, we have considered whether they could be used in a weighted average combination. Having done so, our view is that this is unlikely to overcome the shortcomings of the individual market-based measures. Combining two (or more) less suitable measures will produce a less suitable measure. Further, it is unclear how the weightings would be determined rigorously and consistently over time.

The ENA and its supporting service providers and industry bodies submitted that it is not possible to obtain the best estimate of expected inflation for use in the current framework without giving material weight, or at least some weight, to market evidence, and that a number of other regulators adopt this approach.[250] We assume the implication of the ENA's proposal is that the method used to estimate expected inflation would involve some form of a weighted average of one or more market-measures.

We are not aware of any regulators that use a weighted approach to estimate expected inflation. The examples provided by the ENA include regulators that adopt a bond break-even approach.[251] That is, they do not give weight to market measures when estimating expected inflation – they either use a market-measure or do not use one at all.

The ENA did not propose how any weighting could be determined or how they might change over time. Further, the ENA did not show how an approach that gives material weight, or at least some weight, to the market evidence is likely to be more congruent with market expectations, and thus result in the best estimates of expected inflation.

We also consider that the application of a weighted approach to market measures poses further robustness and replicability issues. The net effects of the biases affecting each market-based measure may require continual estimation to remove the appropriate bias and apply the correct weighting. This estimation is not only a complex exercise, but it is also subjective. The estimate is likely to be sensitive to chosen study parameters, such as choice of model, sample period and proxies for expected inflation.

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249 RBA, *Statement on Monetary Policy - August 2020 - Inflation*, August 2020, p. 86.

250 ENA, *Submission to discussion paper, inflation review 2020,* July 2020, p. 50.

251 ENA, *Submission to discussion paper, inflation review 2020*, July 2020, pp. 9 and 49.

As these events have little or no influence on the actual market expectation of inflation, the method would rank poorly in terms of robustness.

Given the complex and subjective nature of a weighted approach to market-based measures, we consider that it would similarly rank poorly in terms of transparency and replicability. For these reasons, we do not consider that a weighted average of market-based measures should be used to estimate expected inflation.

12 Should we introduce a glide-path?

The material before us indicates that the RBA's target band remains a critical influence on expectations of future inflation.[252] In particular, the RBA remains committed to managing inflation within the target band, and expectations trend to the mid-point of the target band in the medium-term.[253]

However, there is evidence that the transition back to the mid-point of the RBA's target band may take longer than previously. This is supported by:

- Statements from the RBA including:

  > …the global outbreak in coronavirus is expected to delay progress in Australia towards full inflation and the inflation target,[254] and
  >
  > Inflation is not likely to be within the 2-3 per cent target range for at least three years.[255]

- Data from Consensus Economics' surveys showing a transition over years 3 to 5 back to the mid-point of the target band.
- Inflation outcomes that have been below the mid-point of the RBA's target band for an extended period.

On the basis of this evidence we are proposing to introduce a glide-path approach to provide the best estimate of expected inflation. We invite submissions on whether this proposal is warranted, and if so, what form the glide-path should take.

The glide-path approach is a modified version of our current approach, and is based on the proposition that it may take a number of years for inflation to return to the mid-point of the RBA's target band following a disturbance. The use of a glide-path approach in the current inflationary environment is supported by both Deloitte and Dr Lally's reports. Deloitte found the glide-path approach to be 'simple, easily replicated and potentially more congruent with long-term inflation expectations of market participants' provided that the glide-path is clearly defined by the regulator'.[256] Similarly, Dr Lally noted that a glide-path approach is appropriate 'because reversion back to the RBA's target is currently expected to be unusually slow'.[257] However, we consider the glide-path should be both enduring and symmetric in its application. This is discussed further in sections 12.1.3 and 12.1.4.

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252 Deloitte Access Economics, *Review of regulatory treatment of inflation*, June 2020, pp. 16–17.
253 Deloitte Access Economics, *Review of regulatory treatment of inflation*, June 2020, p. 24.
254 RBA, *Statement by Philip Lowe, Governor: Monetary Policy Decision*, 3 March 2020.
255 RBA, *Opening Statement to the House of Representatives Standing Committee on Economics*, 14 August 2020.
256 Deloitte Access Economics, *Review of regulatory treatment of inflation*, June 2020, p. 23.
257 Dr Martin Lally, Capital Financial Consultants, *Review of the AER's inflation forecasting methodology*, 8 July 2020, p. 3.

In the consultants' reports from Dr Lally[258] and Deloitte[259] both noted that the glide-path is not perfect and is subjected to potential weaknesses, which includes determining when it is appropriate to use the glide-path approach and how to specify the length and speed of the glide-path. These difficulties arise because there is no clear method for identifying the types of disturbances that would affect medium-term inflation expectations.

The CRG and EUAA both recognised that inflation is expected to take longer to return to 2.5 per cent and thus, are also open to a glide-path approach.[260] The EUAA noted more analysis is required to inform when a glide-path should be adopted and the trajectory of the glide-path. Similarly, the CRG suggested that we further investigate the use of a glide-path and posed a number of questions which we explore in the sections below.

The CRG also questioned whether application of a glide-path will have any unintended consequences for the PTRM framework. We do not consider there to be any consequences to the overall regulatory framework in applying a glide–path to estimate expected inflation. This is because a glide-path is a mechanism used in the PTRM to escalate inputs into nominal terms, and calculate an estimate of expected inflation on the RAB to be removed from revenue. Its main effect is to convert the allowed nominal rate of return into the initial real rate of return to be delivered by the regulatory framework.

In contrast, MEU and the ENA do not support a glide-path.[261] MEU noted that the glide-path approach would introduce more assumptions which may introduce errors. Likewise, ENA noted that 'the start and end points of any glide-path are inevitably arbitrary and should not be fixed across all market conditions'. We consider these concerns in the sections below.

There are however, a number of precedents for the use of glide-path approach in the regulatory treatment of inflation, with the Commerce Commission of New Zealand and the Essential Service Commission of South Australia (ESCOSA) both using a form of linear glide-path to estimate expected inflation.[262]

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258 Dr Martin Lally, Capital Financial Consultants, *Review of the AER's inflation forecasting methodology*, 8 July 2020, p. 30.

259 Deloitte Access Economics, *Review of regulatory treatment of inflation*, June 2020, p. 23.

260 CRG, *Submission to discussion paper, inflation review 2020*, July 2020, p. 28; EUAA, *Submission to discussion paper, inflation review 2020*, July 2020, p. 2.

261 MEU, *Submission to discussion paper, inflation review 2020*, July 2020, p. 7; ENA, *Submission to discussion paper, inflation review 202*0, July 2020, p. 49.

262 Commerce Commission New Zealand, *Electricity Distribution Services Input Methodologies Determination 2012*, 20 May 2020, p. 112; Essential Services Commission of South Australia, *SA Water Regulatory Determination*, June 2020, p. 5.

12.1 What form should the glide-path take?

There are numerous alternatives the form of a glide-path may take. These options include, but are not limited to:

- a simple linear glide-path,
- a non-linear glide-path,
- a linear glide-path with a mechanism which restricts and caps movement in the glide-path from year to year, or
- a non-linear glide-path with a mechanism which restricts and caps movement in the glide-path from year to year.

Our draft position is to use a simple linear glide-path approach where inflation is expected to revert to the RBA's mid-point in a linear pattern (i.e. at equal steps for each year of the glide). The change in expected inflation from year to year in the glide-path will be gradual and consistent and move in one direction. In contrast, a non-linear glide-path is when inflation is expected to revert to the mid-point at an increasing or decreasing rate. For example, inflation might be expected to make large movements toward the mid-point initially, followed by smaller movements before finally arriving at the target.

The CRG proposed an alternative form of glide-path that would place a cap on the annual change in the glide-path.[263] For example, applying a cap on annual movements to 0.25 per cent would mean that if the forecast for year two was 2 per cent, the approach would assume a two year glide to 2.5 per cent. If the forecast for year two was 1 per cent, it would assume six years to return to 2.5 per cent. While we think this approach has merit, it is not clear that it is a better fit with observed movements in inflation expectations than the linear approach. It may also be difficult to calculate an appropriate cap on annual movements, or rely on arbitrary assumptions resulting in a relatively less robust and simple estimate.

While a number of forms of glide-path may be equally transparent and replicable once parameters of the glide-path are set, we acknowledge that setting the parameters requires judgement. Our choice of the linear glide-path over alternatives has been informed by data from the Consensus Economics surveys. Further, the relative strength of a linear glide-path, compared to, for example, a glide-path with annual caps or the ENA's hybrid approach, is its simplicity.

While our preference at this time is to apply a linear glide-path approach, we welcome stakeholders' comments on whether an alternative form should be used, including calculations of how an alternative may operate.

[263] CRG, *Submission to discussion paper, inflation review 2020*, July 2020, p. 28.

12.2 How long should the glide be?

The length of the glide-path is dependent on how long it is expected to take for inflation to return to 2.5 per cent. Currently, the data we have suggests that expected inflation might take around five years to return to 2.5 per cent. Therefore, in our draft position, we are proposing a glide term to year 5. For a typical five year regulatory period, adopting a linear glide-path, and based on the RBA's current practice of forecasting inflation for two years, our estimate of inflation would be:

- Year 1: RBA forecast
- Year 2: RBA forecast
- Year 3: Glide value
- Year 4: Glide value
- Year 5: 2.5 per cent.

If expected inflation were to reach the mid-point of the target band in year 3, then the glide would play no role in our estimate of expected inflation. Alternatively, if inflation were expected to reach the mid-point of the target band in year 4, only a glide value would need to be estimated for year 3 — 2.5 per cent would be used for years 4 and 5. To some extent the glide-path approach is self-adjusting. When the RBA's forecasts are close to 2.5 per cent the glide-path adjustments are immaterial.

Sometimes regulatory periods are longer or shorter than five years. For shorter periods, we propose to use the relevant points from the RBA's forecasts and any applicable values from the year linear glide-path. For longer regulatory periods, we propose to use the estimates noted above plus the mid-point of the RBA's target band thereafter.

We also note that even if the glide-path does not exactly match the length of future regulatory periods, it is an unbiased approach for future periods if the length is determined now. If we determine the length of the glide-path now, this will provide an unbiased approach for future determinations. This is because we do not know if inflation will be above or below 2.5 per cent in the future.

We welcome stakeholders' submissions on the appropriate length of the glide-path.

12.3 Should the glide-path be symmetric in its application?

We consider that the glide-path should be symmetric in its application. This means that a glide-path back to the mid-point of the target band would be applied in the same manner whether short-term forecasts are above or below the mid-point. We consider this is important so that scenarios in which expected reversion back from a low figure is unusually slow are matched by scenarios in which reversion back from a high figure is similarly slow. We note Dr Lally's recommendation that if symmetry of reversion speed

exists then we should retain our current approach.[264] This is because the error in the estimate will average out over multiple regulatory periods if slow reversion is in fact symmetric.

Applying a glide-path only when short-term inflation forecasts are below the mid-point is likely to result in an estimate of expected inflation that is biased downward in the long-term, based on the evidence before us. That is, we observe a relatively symmetrical pattern of expected reversion in the Consensus Economics data when inflation is above or below the RBA's target band. As discussed in section 8.2, the best estimate of expected inflation should be unbiased, and we consider that this is only achieved when the glide-path is applied symmetrically. We consider the same argument applied by Dr Lally to recommend maintaining the current approach—that on average the error will be offset—can likewise be used to recommend a symmetric glide-path.

12.4 Should we adopt a glide-path on an enduring or temporary basis?

We consider that a linear glide-path, applied symmetrically, should be applied on an enduring basis as it provides a robust method that can be used regardless of wide-reaching events or disturbances to market data.

Compared with our current approach, the glide-path has a larger impact on the estimate of expected inflation when the RBA's short-term forecast is further removed from the mid-point of the target band, and a minimal impact when it is already close to the mid-point. This is discussed further in chapter 11. As such, the glide-path approach is flexible and adaptable to market uncertainty and different economic environments. Relative to our current approach, we expect it will perform better during periods of sustained high or low inflation when the short-term estimates remain substantially different from the mid-point of the target band. However, in more normal circumstances there will be little difference between the current approach and the glide-path approach.

Adopting the glide-path approach as a temporary measure would raise a number of concerns, including how the timeframe of application is determined and potential gains (or losses) with determinations within that timeframe (or outside). Unless we established clear rules now on when we would revert to the current approach, it would reduce the consistency and predictability of a regulation and require a further review to determine its removal. It may also be perceived to result in asymmetric outcomes that could disadvantage consumers over the long-term.

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[264] Dr Martin Lally, Capital Financial Consultants, *Review of the AER's inflation forecasting methodology*, 8 July 2020, p. 30.

13 Should we combine a shorter term and glide-path to estimate expected inflation?

We consider that the method that is likely to result in the best estimates of expected inflation is to employ both a shorter target inflation term (by matching the length of a regulatory period) and a glide-path over five years. Albeit that these two positions have been reached sequentially and on different basis.

Introducing a shorter inflation term

As explained in chapter 12, we consider that using a term that matches the regulatory period will ex-ante match expected inflation over the regulatory period, and that this is a better approach than matching the 10 year term of the rate of return. This ensures that in expectation, the nominal rate of return and real rate of return is achieved over the regulatory period.

Use of a glide-path

Following our draft position on the appropriate term to estimate expected inflation, there is a subsequent question of the best method to estimate expected inflation over that term. On this point, we are also persuaded that applying a glide-path is likely to result in a better estimate of expected inflation if short-term market conditions impact the time it will take for expected inflation to revert to the RBA's mid-point. The glide-path also provides an adjustment mechanism to accommodate market uncertainty. We are proposing a glide-path that will run until year five.

To be clear we consider an estimate of inflation expectations with a glide-path over five years plus a term matching the length of the regulatory period is likely to result in the best estimate of expected inflation over the regulatory period. We also consider an estimate of expected inflation over a ten year term with a glide-path over five years is likely to result in the best estimate of inflation expectations over a term of 10 years. We consider each method to be measuring different things, and result in the best estimate of the respective inflation expectation term.

Draft position on the method to determine the best estimate of expected inflation under the NEO/NGO

Our draft position is that, a term that matches the length of the regulatory period together with a glide-path as outlined above, will provide a method likely to result in the best estimate of expected inflation, and therefore achieves the NEO/NGO to the greatest degree.

Specifically, changing the length of the inflation term without including a glide-path would result in a method that maintained the expectation of inflation at 2.5 per cent from year three. It is not clear that this method would be the best estimate of expected inflation over the length of the regulatory period if inflation is expected to take more than three years to revert to the RBA's mid-point.

Conversely, applying a glide-path while maintaining the 10 year term may result in the best estimate of expected inflation over 10 years, however the issue of expected inflation not matching expected RAB indexation over the regulatory period remains. This is why we have decided to introduce an inflation term that matches the length of the regulatory period.

We consider that these two positions, when applied together, address a number of the issues and stakeholder concerns that led to this review. These primary concerns that were raised with us and their mitigation include are outlined in table 2.

Table 2 Concerns with current approach and mitigation with draft position

Issue/concern	Mitigation
That our ten year rate of return may be upwardly biased in a period of extended low inflation outcomes.	We consider that a term that matches the length of the regulatory period will largely address this concern by being more responsive to short-term inflation estimates than long-term estimates. Additionally, a glide-path acknowledges that it may take longer than three years for expected inflation to revert to the mid-point of the RBA's target band.
The inconsistent use of inflation across the PTRM and RFM over the regulatory period because of the use of a ten year estimate of expected inflation.	We consider that using an estimate of expected inflation that is based on a term that matches the length of the regulatory period in the PTRM will ex-ante match expected RAB indexation over the regulatory period. This ensures that ex-ante the expected nominal return (and real return) will be delivered over the regulatory period.
Expected inflation will not revert back to 2.5 per cent by year 3 based on current market data.	We consider that the use of a glide-path approach accounts for inflation taking longer than two years to revert to the RBA's target band.
RBA forecasts are unreliable. Therefore, market-based measures should be adopted.	RBA forecasts remain best available. Shorter term improves responsiveness, glide-path addresses market uncertainty but removes the volatility, biases and distortions of market-based measures.

14 If we make these changes what will be the impact on stakeholders?

Estimating expected inflation is a forward looking approach, therefore it is difficult to quantify stakeholder impacts with a high degree of specificity. However, we have outlined a range of potential scenarios for stakeholder consideration.

Notwithstanding that we are unable to define specific stakeholder impacts, we consider that our approach will deliver the following positive properties:

- It will better match to RAB indexation.
- There will be less uncertainty for service providers and investors as we are estimating expected inflation over a shorter period.
- It will be more responsive to short-term RBA forecasts.
- It is adaptable when inflation is far from the RBA's target band.
- It is more responsive to market conditions.

14.1 Scenarios

Changing our approach has two expected impacts dependent on the year 1 and year 2 RBA inflation forecasts at the time of any final regulatory determination:

- A glide-path approach will change the expected cash flows in a given regulatory period if the RBA forecast of inflation for year 2 is different to 2.5 per cent.
- A change in term will also change the expected cash flows in the future if the geometric average of the RBA’s year 1 and year 2 forecasts of inflation does not equal 2.5 per cent.

In this sense, a change in the current (low forecast inflation) environment may not be NPV neutral and may change the risk consumers face from different short-term inflation forecasts at the time of determinations and the expected cost to consumers for regulatory periods commencing before 2025.

The following tables sets out the impact of each particular change in different scenarios with different starting values (above or below 2.5 per cent). The glide-path is compared to the current base case (a 10 year term), while the change to a term that matches the regulatory period assumes a glide-path is used and compares the outcome to a 10 year term also with glide-path.

Table 3 Estimates of expected inflation with and without a glide-path

Method	Estimate of expected inflation
Current term (10 years) with RBA forecasts of inflation of 1.25% in year 1 and 1.75% in year 2 – no glide-path	2.30%
Current term (10 years) with RBA forecasts of inflation of 1.25% in year 1 and 1.75% in year 2 – with glide-path[265]	2.22%
Current term (10 years) with RBA forecasts of inflation of 2.5% in year 1 and year 2 – no glide-path	2.5%
Current term (10 years) with RBA forecasts of inflation of 2.5% in year 1 and year 2 – with glide-path	2.5%
Current term (10 years) with RBA forecasts of inflation of 3.75% in year 1 and 3.25% in year 2 – no glide-path	2.70%
Current term (10 years) with RBA forecasts of inflation of 3.75% in year 1 and 3.25% in year 2 – with glide-path[266]	2.77%

Table 3 shows that a glide-path (gliding to 2.5 per cent in year 5) provides an estimate that is more responsive to short-term inflation forecasts. This means that when short-term forecasts change, there is a greater change in the overall estimate of expected inflation than without a glide-path. This in turn makes consumer prices, and revenues recovered more volatile in response to changes in short-term RBA inflation forecasts.[267] In times of low (high) forecast RBA inflation the estimates of expected inflation are lower (higher) than the no glide-path approach. However, the results for the two methods are the same if RBA short-term forecasts are 2.5 per cent.

[265] Individual year values are: 1.25%, 1.75%, 2%, 2.25%, 2.5%, 2.5%, 2.5%, 2.5%, 2.5%, 2.5%.

[266] Individual values are: 3.75%, 3.25%, 3%, 2.75%, 2.5%, 2.5%, 2.5%, 2.5%, 2.5%, 2.5%.

[267] Note that the table uses a glide-path to 2.5% in year 5. However, the general principle applies that any glide-path makes the inflation estimates more volatile. A longer glide-path (relative to a shorter glide-path) will increase this volatility all else equal.

Table 4 Estimates of expected inflation using a 5 year term versus a 10 year term (both assuming a glide-path)

Method	Estimate of expected inflation
Current term (10 years) with glide-path and with RBA forecasts of inflation of 1.25% in year 1 and 1.75% in year 2	2.22%
Proposed term (5 years) with glide-path and with RBA forecasts of inflation of 1.25% in year 1 and 1.75% in year 2[268]	1.95%
Current term (10 years) with glide-path and with RBA forecasts of inflation of 2.5% in year 1 and year 2	2.5%
Proposed term (5 years) with glide-path and with RBA forecasts of inflation of 2.5% in year 1 and year 2	2.5%
Current term (10 years) with glide-path and with RBA forecasts of inflation of 3.75% in year 1 and 3.25% in year 2	2.77%
Proposed term (5 years) with glide-path and with RBA forecasts of inflation of 3.75% in year 1 and 3.25% in year 2[269]	3.05%

Table 4 shows that a change to an inflation term that matches the regulatory period also has the effect of providing an estimate that is more responsive to short-term inflation forecasts. This again makes revenues recovered, and consumer prices more volatile in response to changes in short-term RBA inflation forecasts. In times of low (high) forecast RBA inflation the estimates of expected inflation are lower (higher) than the current approach of using a 10 year inflation expectation. However, the results are the same where you do not expect the RBA short-term forecasts to be different to 2.5 per cent.

Table 5 shows the potential outcome of the above changes given the current RBA inflation forecast for 2021–22 of 1.25 per cent and assuming an RBA inflation forecast of 1.75 per cent for 2022–23. We have assumed 1.75 per cent in 2022–23 based on 1.25 per cent linearly reverting to 2.5 per cent in 2024–25 and the RBA rounding to the nearest 0.25 per cent. As shown in table 5, combining a shorter term with a glide-path results in a lower estimate—based on the latest RBA estimates—than either change individually. Changing to a glide-path alone results in an 8 basis point reduction in the estimate of expected inflation. However, moving to an inflation term that matches the length of the regulatory period from there results in an estimate that is a further 27 basis points lower than the 10 year estimate with a glide-path. Moving to a 5 year term absent a glide-path would have a 20 basis point impact in comparison to a 10 year inflation estimate without a glide-path.

[268] Individual values are: 1.25%, 1.75%, 2%, 2.25%, 2.5%.

[269] Individual values are: 3.75%, 3.25%, 3%, 2.75%, 2.5%.

To provide context we have applied our draft position to our draft Victorian electricity distribution determinations for 2021–26.[270] Using our draft position, we calculate an estimate of expected inflation of 1.95 per cent using the latest RBA figures.[271] This estimate is calculated as:

$$1.95\% = [(1 + 1.25\%) \times (1 + 1.75\%) \times (1 + 2.00\%) \times (1 + 2.25\%) \times (1 + 2.50\%)]^{\frac{1}{5}} - 1$$

This compares to an estimate of 2.30 per cent with the current approach using the same short-term estimates.

$$2.30\% = [(1 + 1.25\%) \times (1 + 1.75\%) \times (1 + 2.50\%)^{8}]^{1/10} - 1$$

Table 5 Estimates of likely expected inflation numbers for the Victorian distribution decisions using different terms with and without a glide-path.

Method	Estimate of expected inflation
Current method (10 years)	2.30%
Current method + glide-path	2.22%
5 year + glide-path	1.95%
5 years (no glide)	2.10%

Adopting 1.95 per cent for our draft Victorian distribution determinations would result in about an extra $300 million ($real 2021) in allowed revenue over the next five years, compared to adopting 2.30 per cent using the current method. This is the result of applying a higher real rate of return to the RAB due to a lower estimate of expected inflation being removed from the nominal rate of return. The average estimated nominal rate of return across the five Victorian service providers is 4.05 per cent. Combining this with our estimate of expected inflation using our draft position results in an expected real rate of return of 2.07 per cent, compared to 1.71 per cent using the current approach.

This higher real rate of return results in real prices for distribution network services decreasing by around 12 per cent over the period, compared to 14 per cent using the current method. This difference equates to around $8 more per annum on a (Victorian) customer's bill than using the current method—holding all else constant.

We are conscious that the combination of a glide-path and a term that matches the length of the regulatory period will have a material impact on revenues recovered, and prices for consumers if current short-term estimates persist and we have no transitional delay. At the same time, we consider that the combination addresses the submitted

[270] Our draft distribution determinations for the five Victorian distributors were released on 30 September 2020. See: https://www.aer.gov.au/networks-pipelines/determinations-access-arrangements

[271] This figure uses the December 2021 and December 2022 values (1.00% and 1.50% respectively). The final decision for the Victorian service providers will use the June 2022 and June 2023 values once available.

issues with our current method and will result in us calculating the best estimate of expected inflation as required by the NER/NGR from the point of commencement. We are open to considering whether a transition could appropriately balance these issues and this is discussed further in chapter 15.

15 If we change the inflation term, do we need a transition?

We are still considering whether a transition is required given that the change in approach may create a once-off impact for service providers and consumers. A transition could take the form of a deferral (or a phasing in) of the shorter term of 5 years. We are considering this in the context of which approach is likely to result in the 'best estimate' of expected inflation in the context of achieving the NEO and NGO.

We are interested in stakeholders' views. To aid these submissions, we have set out advantages of no transition versus a transition via delay.

15.1 The advantages of immediately moving to a term matching the length of the regulatory period

Changing the inflation estimate term immediately has the following advantages:

- An inflation estimation term matching the length of the regulatory period occurs immediately for all future revenue determinations. It avoids delays matching the inflation estimate to the term of the regulatory period and therefore to targeting inflation matching RAB indexation
- Immediately removing the ex-ante mismatch between the allowed return on capital and the expected nominal return (including RAB indexation) over upcoming regulatory periods. This mismatch is due to expected inflation being below 2.5 per cent over the next several years.
- It reduces problems arising for the service providers from negative returns to equity and low cash flow during a period of low inflation.

15.2 The advantages of a transition period

Delaying the introduction to the change in inflation term, or smoothing its impact has the following advantages:

- It should still result in correct compensation in NPV terms over the life of the assets. In this sense, it should still result in efficient investment.
- It avoids or reduces any potential gains or losses that may occur as a result of an immediate change in methodology. In particular, it would avoid or reduce any potential impact of an immediate change in our upcoming decisions where the new approach is likely to change the present value of revenue over the next regulatory period.
- Depending on the form of transition, it may allow the change to be deferred to a date where there is no material expected cost to consumers or service providers from the change.
- It allows us to simultaneously consider the appropriate term for rate of return in the upcoming rate of return instrument process. If we decide to change the term we

use in the rate of return, we can change inflation at the same time and avoid any potential ex-ante mismatch.

15.3 Weighing the alternatives

Over the lives of the RABs, we expect that both an inflation term matching the length of the regulatory period and a 10 year inflation term will deliver appropriate compensation. That is, if we were to pick one approach and adopt it on an enduring basis, we would expect any imbalances within individual regulatory periods to balance out and deliver appropriate compensation over the longer-term. For this reason, we consider both methods are capable of achieving the NEO and NGO.

Whether to apply a transition is a matter of regulatory judgement. We note that at this time the impact of the change is not known with certainty as our next decisions will incorporate estimates of inflation from the RBA's Statement on Monetary Policy in February 2021. Further, the impact of the potential mismatch between our current approach and the indexation of the RAB is also uncertain. However, based on submissions from the service providers this impact may be significant and therefore should be addressed presently.

On the other side, based on current market data, our change in approach could lead to a significant increase in the revenue we would allow in our upcoming decisions. We need to be confident such an increase is a genuine result of a mismatch and not a windfall gain or loss.

While we are not committed to a position, if we were to provide a transition, one option would be to delay the change in the inflation term until expected inflation is not materially different to 2.5 per cent. If we took this view, we would be determining the best estimate of expected inflation with a 10 year estimate until a future date. Alternatively, we could defer the decision to change the term to our upcoming review of the rate of return instrument and consider the term simultaneous with the appropriate term for the rate of return.

We are interested in exploring this issue (transitional adjustment/period) further, and would appreciate stakeholders' views on this issue in their submission to this draft position. We are particularly interested in the following questions (noting stakeholders should feel free to comment on anything they consider relevant to our decision):

- Should we have a transition, and if so, should this done by delaying the move to term that matches the regulatory period to estimate expected inflation? Why do you hold this view? Are there alternative transitional arrangements that should be considered?
- If we were to delay the implementation of the use of term that matches the length of the regulatory period to estimate expected inflation, when should the change be implemented? Why do you hold this view?

16 What do we think about more substantial changes to the regulatory framework?

Broadly, there are three approaches to rate of return targeting that have been raised by stakeholders:

- Target real rate of return on capital (current approach)
- Target real rate of return on equity (and nominal rate of return on debt, otherwise referred to as a hybrid approach)
- Target a nominal rate of return on capital.

We are satisfied that the current regulatory framework delivers a real rate of return consistent with the rules. We have considered the material before us and at this time, we are not persuaded that we should pursue a change to the regulatory framework through a rule change proposal to the AEMC. Our reasons are outlined below and appendix I.

16.1 Does our framework and approach deliver its intended target?

To assess whether our current approach delivers the initial real rate of return it is necessary to consider the complex interactions between:

- Different regulatory processes—that is, the impact of inflation throughout the PTRM, annual pricing adjustments and RFM.
- Multiple regulatory periods—that is, where lagged series are used and overcompensation in one period may be offset by under-compensation in the next.
- The allowed rate of return and direct inflation adjustments—that is, compensation for inflation can be provided via an ex-ante risk premium or an ex-post adjustment to cash flows.

We consider that the current regulatory framework delivers the intended target, the initial real rate (derived from the initial nominal rate of return less our estimate of expected inflation) plus actual inflation outcomes over the regulatory period. This is delivered irrespective of the actual rate of inflation.

More detail on how our framework delivers its target and the causes of (minor) deviations from this target are discussed in appendix I.

16.2 What are the characteristics of the current approach?

Importantly, targeting the real return on capital provides stable real returns to investors (in aggregate) and stable real prices to consumers. Furthermore, targeting a real rate of return is consistent with the rules.[272]

16.2.1 What is the economic rationale for the current approach?

We set the allowed rate of return so that service providers can attract the necessary funds from capital markets to provide the energy services that consumers seek. The underlying objective for the service provider is to achieve a real return consistent with the opportunity cost of capital. Since the revenue recovered by the service provider will be in nominal dollars, they also expect to be compensated for inflation. Ex-ante, the initial nominal rate of return reflects the joint assessment of expected real returns and inflation. However, receiving inflation compensation is not an end to itself; it matters only because it determines whether or not the underlying initial real rate of return is received. The current regulatory framework therefore focuses on this outcome. This also results in network charges that are more stable in real terms for consumers.

Equivalently, the focus on real outcomes can be explained in terms of the inflation treatment of the capital investment (RAB). Investors expect to maintain the real value of the RAB across multiple regulatory periods, which means compensation for actual inflation once it becomes known. This is particularly important with long lived assets such as those in the electricity and gas sectors. A framework that targets the initial real rate of return plus actual inflation outcomes will naturally incorporate the indexation of the RAB using actual inflation. This also aligns with the implementation of real straight-line depreciation, spreading the depreciation cost equally across consumers over the life of the assets (inter-generational equity).[273]

With this background, the current approach for the regulatory treatment of inflation can be described as achieving a real policy outcome (delivery of the initial real rate of return, adjusted for ex-post inflation outcomes), but within a nominal framework.[274] The same real policy objective could be obtained without specifying that we start with a nominal rate of return. The advantage of the current approach is that there is explicit consideration of inflation effects and it aids regulatory transparency and consistency to publicly address these matters. Any real calculation will require conversion between nominal terms.

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[272] See Chapter 3 for more detail.

[273] Real straight-line depreciation means that we calculate the decrease in the value of the opening asset base by assuming an equal decline in real terms each year until the asset expires (so real asset value divided by remaining life). This real amount is then adjusted for inflation and labelled nominal straight line depreciation.

[274] Further, indexation on the asset base is related to another policy objective, which is the delivery of real straight line depreciation.

The approach also ensures that revenues and/or prices for network services are set in real terms. This has benefits where consumers' ability to pay also move in line with inflation.[275]

In conclusion, we consider that the current framework has a range of desirable qualities that are to the advantage of service providers, investors and most importantly consumers including:

- The treatment and estimation of inflation is explicitly factored into our decisions and can be tested and monitored.
- Our decisions preserve purchasing power for all. Network charges for consumers move in line with their incomes and wages. Investor capital is preserved.
- There is automatic adjustment for movements in actual inflation. Any surprise changes in inflation are handled automatically. This mitigates a key source of risk.
- Service providers and their investors face a clear regulatory framework that has operated successfully and been tested over many years. They are able to make informed decisions about how to finance their operations. The risks associated with these financing decisions reside with the agents that are best placed to manage them.

16.3 What are the hybrid and nominal frameworks that have been proposed?

Industry bodies, service providers and their investors have proposed two alternative frameworks to the current approach: a hybrid (with a real return on equity) and a full nominal framework. We explore these options in the following sections.

16.3.1 What is a real return on equity (hybrid) approach?

A hybrid approach would not singularly provide a nominal return or a real return on capital but would provide a mixture of both. There are a number of ways that a hybrid approach could be implemented, each with its own advantages and disadvantages. Two approaches that were put to us in submissions included those by the ENA and Aurizon.

The ENA's approach was set out as:

> The AER would simply produce an estimate of expected inflation for each regulatory year and use that same figure in both steps of its process (PTRM and RFM) in relation to the 60% of the RAB that is assumed to be financed with debt. This approach would be implemented for each network business at

[275] For more discussion on this point see Section 16.3.2.

the time of its next regulatory determination. The RAB roll-forward would be conducted by:

- Applying the AER's forecast of inflation that is used in that network's current determination to the 60% of the RAB that is assumed to be financed with debt; and
- Applying actual inflation for each year for the 40% of the RAB that is assumed to be financed with equity.[276]

We discuss the implications of this approach in section 16.4 and appendix J.

Aurizon's proposed hybrid approach adjusted the CPI-X to only use expected inflation and does not change the inflation used in the PTRM or RFM.[277] Our assessment is that this approach does not change the framework to a real rate of return for equity, but affects other building blocks, such as operating expenditure. Based on the information presented, it is not clear to us that this is a better approach.

16.3.2 What is a nominal rate of return approach?

A nominal rate of return approach is one that ensures the service providers receive the nominal rate of return unadjusted for actual inflation. Under a nominal approach:

1. Expected inflation is not deducted from the return of capital building block (depreciation is higher than in our current approach)
2. CPI is not incorporated into the CPI-X process or at least removed from revenues that are affected by RAB size
3. The RAB is not indexed for inflation.

This increases the amount that consumers pay today by removing the deduction from the return of capital building block, while decreasing the payments of future consumers by reducing RAB indexation. This methodology has the same net present value as our current methodology.

Under the nominal return approach the service providers' purchasing power will vary inversely with inflation outcomes:

- If actual inflation is below expected inflation, the revenue recovered from consumers will have greater purchasing power than initially expected. The service provider will have more than it needs to undertake a program of works to operate and maintain the energy network efficiently and safely. Returns to investors will be more than needed—that is, the real rate of return on capital will be higher than the initial estimate.
- Conversely, if actual inflation is above expected inflation, the revenue recovered from consumers will have less purchasing power than initially expected. The

[276] ENA, *Submission to discussion paper, inflation review 2020*, July 2020, pp. 32-33.

[277] Aurizon, *Submission to discussion paper, inflation review 2020*, July 2020, pp. 3-4.

service provider will have less than it needs to undertake a program of works to operate and maintain the energy network efficiently and safely. Returns to investors will be less than needed—that is, the real rate of return on capital will be lower than the initial estimate.

From the consumer perspective, the bills they receive will vary in purchasing power terms, in the opposite direction to that for service providers:

- If actual inflation is below expected inflation, the bills received by consumers will take more purchasing power than initially expected. Paying these bills will mean foregoing other purchases, even though the nominal dollar value on the bills is unchanged.
- Conversely, if actual inflation is above expected inflation, the bills received by consumers will take less purchasing power than initially expected. Paying these bills will mean foregoing fewer other purchases, even though the nominal dollar value on the bills is unchanged.

Consumers have certainty over the amount of their bills across the regulatory period (in nominal terms) but not the value of those bills (the purchasing power).

16.4 How do the hybrid and nominal frameworks compare with the current approach?

There are a number of economic considerations before deciding more broadly if a hybrid approach (targeting a real return on equity) or a nominal approach is appropriate and if either promote the NEO and NGO to the greatest degree. We identified that the current framework has a range of desirable qualities that are to the advantage of service providers, investors and consumers. In this section we consider how the properties of the frameworks compare. An overview of some of these are presented in Table 6.

Table 6 Comparison between our current approach, hybrid and nominal approach

Select attributes of current approach	Nominal approach	Hybrid approach
The treatment and estimation of inflation is explicitly factored into our decisions and can be tested and monitored.	Expected inflation would not be explicitly accounted for in our decisions under a nominal approach. Compensation would be implicit through a nominal rate of return.	Under a hybrid approach a mixture of explicit and implicit compensation for inflation would be set.
Expected inflation is required to be estimated. There is a risk that we incorrectly determine the estimate of expected inflation.	A best estimate of expected inflation is no longer required.	Similar to the current approach, estimates of expected inflation would be required.
Our decisions preserve purchasing power for all. Network charges for consumers move in line with their incomes and wages. Investor capital is preserved.	Under a nominal approach network charges for consumers are set and do not move with inflation. Increased risk that if inflation is different than expected then purchasing power for consumers and investor capital is not preserved.	Purchasing power not conserved for consumers. No longer seeking to preserve the purchasing power over the entirety of the capital base but focused predominately on equity holders.

Select attributes of current approach	Nominal approach	Hybrid approach
There is automatic adjustment for movements in actual inflation. Any surprise changes in inflation are handled automatically. This mitigates a key source of risk.	No automatic adjustments for inflation.	Some automatic adjustments made for movements in actual inflation, however, this would affect less than 50% of the asset base.
Service providers and their investors face a clear regulatory framework that has operated successfully and been tested over many years. They are able to make informed decisions about how to finance their operations. The risks associated with these financing decisions reside with the agents that are best placed to manage them.	Distinct change from earlier regulation which could lead to some regulatory uncertainty. However, there is some precedent here through use by other regulators.	Distinct change from earlier regulation which could lead to some regulatory uncertainty. As far as we are aware, there is no precedent here through use by other monopoly regulators. Some emphasis of managing inflation risk shifted from network to consumer.

16.5 Explicit estimation of expected inflation and actual inflation

Under the current approach the treatment and estimation of inflation is explicitly factored into our decisions. As a result, our approach to inflation and its compensation can be tested and monitored. This allows for greater transparency for our approach, in particular around how stakeholders are affected by changes in inflation and whether this treatment is appropriate.

Under a change to a nominal approach, expected inflation would not be explicitly accounted for in our decisions. Compensation would be implicit through the setting of the nominal rate of return. Unexpected changes in inflation would not be accounted for and if the difference is large, cumulatively it could have consequences over the longer term.

The hybrid approach would provide a mixture of explicit and implicit accounting for inflation compensation. This lowers the level of transparency in inflation compensation that we provide when compared to our current approach, but is more transparent than the nominal approach.

16.5.1 Expected inflation estimate required as part of framework

A requirement of the current real return approach for inflation compensation is a best estimate of expected inflation. As this value is unobservable in practice and must be estimated, it comes with the risk that the estimate used is inappropriate (see chapter 8 for further detail). If the estimate is inappropriately set it can cause wealth transfers between the service providers and consumers.

As the nominal approach does not require an estimate of expected inflation, changing to this approach can mitigate this risk (as long as the rate of return is appropriately set). We note that a hybrid approach would still require estimation of expected inflation.

16.5.2 Preserving purchasing power and changing risk

Our current approach preserves the purchasing power of investors over the entirety of the capital base and preserves the network charges consumers' face in line with inflation. A change to approach would change this interrelationship and the risks each face.

Changing relationship between CPI, cash flows and financial incentives for investors and service providers

If we were to implement the hybrid approach submitted by the ENA it will affect the RAB indexation used in the RFM update process. This fundamentally changes the current relationship of future cash flows (asset value) being kept constant in real terms (see appendix I below for more details). In its report Sapere also stated that this fundamentally changes the framework:

> Adopting a hybrid rate of return targeting real returns on equity would mitigate the risk that cash returns on equity are negative, by reducing the level of revaluation gains in favour of cash returns. However, it fundamentally changes the regime to one that focuses on the value of the entity to shareholders, not the overall value of the entity. Targeting the real rate of return on capital preserves the total value of the investment and provides an incentive to outperform the cost of debt allowance. Adopting a hybrid targets the real return on equity, preserving the value of the shareholders' investment. The overall value of the entity may change.[278]

If we were to change to a hybrid approach it would also affect financing risk. Sapere stated in its report:

> A hybrid approach that decomposed the expected revaluation gain into a revaluation gain for equity holders and an expense in setting the ARR would effectively shift the regulatory regime from targeting a total real rate of return to targeting a real rate of return on equity; it would thereby intervene in the capital structure decision and thus result in a less efficient allocation of the risk of financing decisions.[279]

Alternatively, if we were to use a nominal approach it would not compensate service providers for actual changes in inflation outcomes. This is because expected inflation is ex-ante compensated in the nominal return rather than actual inflation outcomes. This has the potential to lead to some disconnect between the real value of long lived investments compared to the real value expected ex-ante.

Change of risks under a change in approach

A key question is the resulting impact on the risks. Submissions on the effect of the hybrid methodology on risk were not comprehensive and leave unanswered questions.

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[278] Sapere, *Target return and inflation - Input to the AER Inflation Review 2020*, 30 June 2020, p. 28.

[279] Sapere, *Target return and inflation - Input to the AER Inflation Review 2020*, 30 June 2020, p. 30.

The ENA's submission stated that consumers should pay the nominal cost of debt in each period and that changing to a hybrid approach enables them to pay exactly the nominal cost of debt even if inflation is different than expected.[280] It is unclear that this is a risk that consumers would directly be concerned with facing.

Sapere suggested that financing risks are best considered by those that can best manage the risk, stating:

> We agree with the AER that service providers are best placed to bear the risk of their financing decisions, rather than consumers, and that by targeting total real returns the benefit or detriment from financing decisions remain the concern of the service provider.[281]

APGA submitted that consumers may prefer energy prices to move in line with expected inflation rather than actual inflation to act as a buffer.[282] That is, they may prefer to have energy prices move more slowly when other prices are increasing faster and vice versa. APGA did not provide evidence to support this aspect of its submission. By contrast, we observe that prices linked to CPI can act as a natural stabiliser for consumers as incomes and wages tend to be positively correlated with inflation.[283] Welfare payments are also often linked to either wage growth or changes in CPI.

The CRG noted that it cannot form a definite view on whether there should be a different target, and it required more fundamental modelling of the potential impacts on consumers under different economic scenarios. The CRG's submission stated that advocates for a hybrid model must provide appropriate evidence to the CRG of consumers' acceptance of such a change.[284]

With regard to the nominal approach we find that, unlike the real approach, the spread of the depreciation cost is not shared equally across consumers over the life of the assets in real terms. We consider this results in a less equitable recovery of costs.

Second, if a nominal approach is applied then consumers would have more certainty over the amount of their bills across the regulatory period (in nominal terms), but not the value of those bills (the purchasing power). It is not clear to us that this is a desirable change, in particular if such a change introduces regulatory uncertainty.

We invite further submissions on the direct benefits for consumers of this change in approach to a hybrid methodology.

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280 ENA, *Submission to discussion paper, inflation review 2020*, July 2020, pp. 29-32.

281 Sapere, *Target return and inflation - Input to the AER Inflation Review 2020*, 30 June 2020, p. 8.

282 APGA, *Submission to discussion paper, inflation review 2020*, July 2020, p. 24.

283 Parliamentary Library, *Research Paper Series - The extent and causes of the wage growth slowdown in Australia*, April 2019; RBA, *June Quarter 2019 - Explaining Low Inflation Using Models, June 2019,* pp. 143-168; Federal Reserve Bank of Saint Louis, *On the Economy: The Relationship between Wage Growth and Inflation*, November 2015.

284 CRG, *Submission to discussion paper, inflation review 2020*, July 2020, p. 3.

16.5.3 Automatic adjustments for actual inflation

There are automatic adjustments for changes in actual inflation as part of the current approach. These adjustments and some of their effects are detailed in appendix I. Any changes in inflation are handled automatically and this ensures that purchasing power for consumers and investors' capital base is maintained. This mitigates a key source of inflation risk.

A change to a nominal or hybrid approach would either remove this automatic adjustment entirely (in the case of a nominal approach), or reduce it (in the case of a hybrid approach).

16.5.4 Regulatory certainty

Regulatory certainty is an important part of our regulatory regime for both investors and consumers.[285] To our knowledge, a hybrid approach has not been employed to date by other regulators within Australian or internationally. As such, its impacts and consequences are untested. As a result, a change to a hybrid approach has the potential to increase regulatory uncertainty and have unintended consequences.

By contrast, the current treatment of inflation in the regulatory models has long standing regulatory precedent. It has been applied in all our decisions across gas and electricity sectors. For more information see chapter 7.

The CRG has indicated to us that they prefer that we apply a high threshold for changes to the current approach:

> The CRG accepts the AER should apply a "high bar for change". We are strongly opposed to changes that are adopted in response to short-term issues at the cost of longer-term predictability and transparency for investors and consumers.
>
> In particular, any alternative methodology must clearly demonstrate it better contributes to the National Electricity Objective (NEO) and National Gas Objective (NGO), and this improvement is material over time.[286]
>
> Consistency is also considered a positive of our processes by some credit rating agencies.[287]

We consider that a departure from targeting the real rate of return would be a fundamental change to the regulatory framework.

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[285] CRG, *Submission to discussion paper, inflation review 2020*, July 2020, p. 32. Moody's. Regulated Electric & Gas Networks – *Cross Region: Lower returns hit key ratios, but regulatory consistency still supports credit quality*, 9 September 2020.

[286] CRG, *Submission to discussion paper, inflation review 2020*, July 2020, p. 9.

[287] Moody's. Regulated Electric & Gas Networks – *Cross Region: Lower returns hit key ratios, but regulatory consistency still supports credit quality*, 9 September 2020.

We also note, given the long regulatory precedent for the current approach, and the alignment between available rate of return data and the current approach, any change to an alternative target involves risk. There are practical problems in any such change, including the risk of windfall gains (losses) for service providers—and therefore windfall losses (gains) for consumers.

It is not clear how we would alter our method for estimating the rate of return if we were to target an initial nominal return or a real return on equity. Some of the currently available data would not be directly relevant (since it embodies the current inflation treatment). We would need to set the nominal rate of return without this data or make a judgement on the appropriate conceptual adjustment that would align the data with the chosen approach. This situation would continue for a period of time, until sufficient time had elapsed under the new approach (perhaps five years or more).

16.5.5 Treatment of risk and consistency with rate of return

Another consideration when assessing whether to change approach is whether service providers can hedge or adjust for the exposures inherent the current framework and whether they are appropriately compensated for the risks they face.

Some stakeholders submitted that it is not economical to use available financial instruments to hedge against actual inflation risk different to our expected inflation estimates.[288] This can be because of transaction costs or liquidity premia that create a wedge between the inflation risk and the cost of the hedge. As noted in chapter 11, many financial instruments used for hedging inflation include premia incorporated into the pricing of the instruments for different risks. As a result, the unbiased expected inflation that is used in our framework is unlikely to exactly match that available in the market which incorporate these premia. However, we understand that some entities (for example, toll roads) which have revenues fixed largely in real terms, hedge some of their debt costs to match their real revenue streams better. We also note that there are a number of other ways that service providers can adjust their financing practices to reduce risk, such as by reducing gearing.

The implementation details of the ENA's hybrid proposal are not fully specified. However, the ENA's proposal involves using an inflation figure other than actual inflation (that is, a weighted average of actual inflation and expected inflation) in rolling forward the RAB from one regulatory period to the next. If that is the case, the approach is unlikely to be consistent with the rules and would require a rule change before it could be implemented.

The current electricity rules preclude us from using a nominal rate of return approach. This is discussed in more detail in chapter 3 and appendix A. If we were persuaded that a nominal or hybrid approach was preferable, we would propose a rule change to

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[288] NSG, *Submission to discussion paper, inflation review 2020*, July 2020, p. 2. Spark Infrastructure, *Submission to discussion paper, inflation review 2020*, July 2020, p. 7.

the AEMC. We expect the AEMC process would take several months. Further, the outcome would be uncertain as the AEMC may have different material available to it and may reach different conclusions when considering the rules more broadly.

16.5.6 Consistency between gas and electricity

In its submission to us, ATCO suggested that we move to a nominal based approach for gas service providers and that there is no barrier in the NGR preventing the adoption of a nominal approach.[289] We agree that the gas rules are less prescriptive than the electricity rules.

When we developed the rate of return instrument in 2018 we considered whether we should employ a different approach between gas and electricity. Overall, we were persuaded that gas and electricity networks were sufficiently similar to adopt a consistent approach. At this time, that continues to remain our view and so it would be inconsistent to employ a different approach on inflation. This preserves regulatory consistency — including consistency with past uniform treatment of gas and electricity service providers — and avoids any investment distortions arising from different treatment between the two sectors. We would also need to be persuaded about the benefits of a nominal framework more generally as we have set out in the previous section.

16.5.7 More implementation details required from stakeholders

If we were to move to a hybrid approach further implementation details would be required from stakeholders proposing the change. In particular, implementation details would help in assessing how the CPI-X would be expected to operate when expected inflation is a mixture of 5 year and 10 year expectations, and what proportion would be updated with actual inflation and whether this might change over time if gearing changes. Detail on whether there would be adjustments for other building blocks such as operating expenditure would also be informative.

16.5.8 Requirement for a transition if a framework change is undertaken

Changes from one framework to another may not be NPV neutral in practice. For a change to be NPV neutral both the expected inflation for 5 years and 10 years would need to be equal. Whether this is likely to be the case is detailed in chapter 10. Similar considerations of a transition as discussed in this chapter and chapter 15 would need to be undertaken to ensure NPV neutrality.

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[289] ATCO, *Submission to discussion paper, inflation review 2020*, July 2020, pp. 12-13.

16.6 Do we think a full nominal framework is a potentially better option than a hybrid framework?

At this time we consider that a change to a nominal approach may be more appropriate than a change to a hybrid approach. This is primarily due to:

- The lack of precedents in using a hybrid approach. To our knowledge, the hybrid approach being untested by regulators and so may have unforeseen consequences. The nominal approach is, however, used by other monopoly regulators.[290]
- The nominal approach also has the advantage of not requiring a best estimate of expected inflation. This is not the case for the hybrid approach.

[290] The Brattle Group, *A Review of International Approaches to Regulated Rates of Return prepared for the Australian Energy Regulator*, June 2020, p. 20. ATCO, *Submission to discussion paper, inflation review 2020*, July 2020, pp. 8-9. Commerce Commission New Zealand, *Input methodologies review decisions Topic paper 1: Form of control and RAB indexation for EDBs, GDBs and Transpower,* 20 December 2016, p. 3; Commerce Commission New Zealand, *Input methodologies review draft decisions Topic paper 1: Form of control and RAB indexation for EDBs, GDBs and Transpower,* 20 December 2016, p. 55.

17 Why is our approach likely to result in the best inflation estimates?

For the reasons set out above and having considered all stakeholder submissions, we consider that our draft position is likely to result in the best inflation estimates and is likely to contribute to the achievement of the NEO and NGO to the greatest degree.

The treatment of inflation and the setting of the rate of return are foundational in setting regulated revenues. It is important they are set appropriately to promote efficient investment in, and operation of energy networks.

The rules require us to determine a method that is likely to result in the best estimates of expected inflation. Our ongoing monitoring of market data, cumulatively, indicated that there may be a better way to estimate expected inflation than we are currently using.

17.1 How we estimate expected inflation?

Having reached the draft position that there is likely to be a better way of estimating expected inflation, we consider that it is necessary to implement that approach. Not doing so, would not promote efficient investment or use of the energy networks. If we did not adopt a better approach, there would be consequences and distortions – over and under investment and inefficient use of energy networks – that would not easily be corrected given the long lives of network assets.

The approach we are proposing is symmetrical and enduring. It is able to operate across a breadth of market conditions and forecasts and is more responsive to changes in market conditions than our current approach. If we make the changes we are proposing, we expect that it is less likely we would need to make subsequent changes in the future.

The impact on revenues and prices of our proposed approach will vary from time-to-time depending on market data and forecasts. Sometimes it might produce a higher estimate of expected inflation than our current approach and at other times it might produce a lower estimate.

Clearly, the precise outcome on revenues and prices depends on movements in data and forecasts before our proposed approach is applied. At the current time, market data and forecasts indicate that our proposed approach is likely to generate a lower estimate of expected inflation and therefore higher revenues and prices than our current approach.

If this occurs, we are of the view that it would be in the long-term interest of consumers. While it may be to consumers short-term advantage to have lower prices, we are concerned that in the long-term, not adopting the best method will undermine efficient investment signals and leave consumers with an energy network that does not deliver services that they are seeking in a safe and reliable way.

We consider that our draft position delivers a method that is likely to result in the best estimate of expected inflation and balances the needs of service provides and consumers.

17.1.1 Use of a glide-path to estimate inflation

We are proposing a glide-path from the year 2 estimate from the RBA to 2.5 per cent in year 5.

We consider this will result in the best estimate of expected inflation over a term that matches the length of regulatory period (typically 5 years). If we maintained a 10 year estimate, we would also propose a glide-path from the year 2 estimate from the RBA to 2.5 per cent in year 5 (that is, use 2.5 per cent for years 5 through 10).

The evidence available to us at this time, especially statements from the RBA, indicate that it is likely to take more time for inflation to return to the RBA's target band than previously. Introducing a glide-path will accommodate a longer adjustment period. At the same time, the linear glide-path we are proposing is self-adjusting, that is, it has minimal impact on our estimate unless inflation forecasts are a long distance (whether over or under) from the RBA's target band.

We are of the view that no transition is required for the change to a glide-path. It is not a framework change, and is aimed at achieving the most unbiased and best estimate of expected inflation over the given forecast term.

17.1.2 Term that matches the length of the regulatory period for an estimate of expected inflation

Under an overall framework methodology that targets an ex-ante nominal rate of return equal to the rate of return instrument over the regulatory period, we consider an unbiased 5 year annual estimate of expected inflation to be the best estimate.

We note that an estimate of expected inflation that matches the length of the regulatory period is not of itself better than a 10 year estimate of expected inflation, but rather a different estimate aimed at achieving a different purpose and outcome. It is better in our circumstances because it aligns with the inflation adjustment we make when we escalate the RAB. We have been persuaded that aligning with our approach to RAB indexation is desirable, so that revenues and capital accumulation are treated consistently.

Our current methodology that provided an annual real return equal to the nominal return over ten year less the expected inflation over the ten years was not incorrect. This provided the best estimate of expected annual inflation and reflected an unbiased 10 year annual estimate.

17.1.3 Do we need a transition?

A key unresolved issue is whether we need a transition when switching to a term that matches the length of the regulatory period. We invite submissions on this point.

Absent a transition, there is potential for gains or losses when switching from one continuous series of 10 year estimates to a series of (typically) 5 year estimates. On the other side, moving to a term that matches the length of the regulatory period is a better match with our escalation of the RAB, and therefore may remove a distortion. For that reason, it could be argued that it should be undertaken immediately.

17.2 Our current real framework works best for consumers

We consider we should maintain our current real framework rather than switching to a nominal or hybrid.

The current approach has a number of desirable qualities that are to the advantage of service providers, investors and most importantly consumers, including:

- The treatment and estimation of inflation is explicitly factored into our decisions and can be tested and monitored.
- Our decisions preserve purchasing power for all. Network charges for consumers move in line with their incomes and wages. Investor capital is preserved.
- There is automatic adjustment for movements in actual inflation. Any surprise changes in inflation are handled automatically. This mitigates a key source of risk.
- Service providers and their investors face a clear regulatory framework that has operated successfully and been tested over many years. They are able to make informed decisions about how to finance their operations. The risks associated with these financing decisions reside with the agents that are best placed to manage them.

As discussed in chapter 16, a change in approach will affect some of these desirable properties. Applying the proposed changes to the estimation of expected inflation while maintaining the current framework will also address some of the concerns raised by stakeholders. Our draft position will result in an estimate of expected inflation that is more responsive to the economic conditions of the time. It will also reduce any problems arising for the service providers from negative returns to equity and low cash flow during a period of low inflation. This will ensure efficient investment in the network.

We are not satisfied that changing to a hybrid or nominal approach is in the long-term interest of consumers at this time, and invite submissions on this topic (in particular on consumer impacts). Further, we consider that the approaches proposed by the ENA are inconsistent with the current rules and expect a rule change proposal to the AEMC would be required.

17.3 How does our draft position respond to stakeholders?

We have carefully considered stakeholders' submissions and concerns in reaching our draft position. Below we provide a summary response to some of the chief concerns that have been raised.

Broadly, the CRG and other consumer representative groups in their submissions:

1. Suggested that we should either maintain our current approach, with some suggesting a potential change to a glide-path.
2. Stated that we should not change the overall framework or undertake a considerable modelling exercise to show that the changes are in consumers' interests.

Our draft position is largely consistent with these submissions. We are changing our estimation approach to a glide-path to better estimate inflation expectations, while also maintaining our overall framework. We, however, do consider that a change to a term that matches the regulatory period is desirable as aligning our approach to RAB indexation will allow revenues and capital accumulation to be treated consistently.

Service providers and investors raised four broad concerns in their submissions on our current approach:

1. Our method for estimating expected inflation is not delivering a best estimate.
2. Actual inflation outcomes do not match our estimate of expected inflation.
3. The current framework does not align with the practice of raising debt in nominal terms.
4. In current market conditions, our approach is delivering a negative cash return to equity.

In general, we have explored concerns one and two in chapters 10 to 15. We also note for concerns three and four:

- These are not new issues (although low interest rates may exacerbate it).
- It is inherent in the real model that is widely used and the issue is a matter of cash flow timing (i.e. NPV over life of assets is equivalent).
- In practice the issues raised have not been significant to date (for more information, see recent profitability data and RAB multiples).[291]
- There are financing options available to the networks to manage this risk (some of which are discussed in chapter 16).

[291] AER, *Electricity Network Performance Report 2020*. September 2020, pp. 41-51.

17.3.1 Our method not delivering the best estimate of expected inflation

Chapter 10 and appendix B set out our detailed consideration on this issue. In brief, our draft position is that there is likely to be a better approach to estimating expected inflation than the one we currently use. This better approach is likely to incorporate a glide-path and a term profile that matches our escalation of the RAB. However, we do not agree that market-based measures deliver a best estimate of expected inflation as proposed by industry bodies and service providers.

17.3.2 Actual inflation differing from expected inflation

Some stakeholders suggested that actual inflation differing from expected inflation leads to incorrect compensation.[292]

We think this concern mixes two related but distinct concepts. Expected inflation is a forward looking concept. You are asking the question: what is the investor's expectation of inflation in coming years? This estimate cannot be tested against actual inflation outcomes. After the estimated expectation has been made, actual inflation will occur, and most likely it will be different to the expectation that is now in the past. This does not mean the expectation was wrong. We do not accept that an estimate of expected inflation can be judged against outcomes that occur in a later period.

Having said that, we do accept that actual inflation outcomes may have a role in informing future expectations. For example, it might be that a sustained period of low or high inflation might influence expectations as they are formed. Nevertheless, the data available to us continues to indicate that the RBA's target band for inflation has a substantial impact on expectations of inflation.

We also note that as part of our framework, we increase and decrease revenues and asset bases in line with actual inflation so purchasing power remains constant. This involves making adjustments for actual inflation being different than what was expected. This is an intentional part of the framework and a desirable one.

17.3.3 Current framework and nominal debt issuance

The ENA described its concern in its submission as:

- A prudent and efficient network issues nominal debt and is contractually required to make nominal interest payments; but
- The AER's regulatory allowance does not match the efficient costs that the benchmark efficient network is contractually required to pay.[293]

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[292] Such as, ATCO, *Submission to discussion paper, inflation review 2020,* July 2020, p. 15. CitiGroup, *Submission to discussion paper, inflation review 2020,* July 2020, p. 8.

[293] ENA, *Submission to discussion paper, inflation review 2020,* July 2020, p. 6.

As discussed in chapter 16, the current approach targets the overall rate of return—the aggregate return across both debt and equity investors—rather than the return to equity holders directly. The equity holders receive the benefit or the detriment of many financing decisions, including what gearing level to target; whether to issue fixed or floating debt; whether to issue debt in Australia or overseas; and so on. The ability to outperform (or underperform) is an important feature of our incentive-based regime. This extends to the inflation implications of financing decisions which may also result in over or under recovery relative to the benchmark. Changing our approach may change the incentives for efficient financing.[294]

We also note that if there is a risk with the current approach, service providers are likely already compensated for it as part of the Beta estimation and the credit ratings used to calculate our rate of return. We consider that, given the long period over which the current approach has been applied, the effect of the current approach will already be included in the historical share market data and credit rating data used when we estimate the rate of return. There are therefore grounds to conclude that the total compensation package we provide will be appropriate.

17.3.4 Negative cash equity returns

A key concern raised by service providers is that in certain conditions a negative cash return on equity can arise.[295] Sapere also suggested that we consider the implications of this in our inflation review.[296]

At the start it is important to note that service providers receive two streams of return: a cash return in the revenue stream and a capital growth stream through the escalation of the regulatory asset base. It is the total of these two streams that is critical and it is important not to look at one stream in isolation. For example, there are numerous companies that have never paid cash dividends but are valued by investors because of their capital accumulation (such as Alphabet Inc., which owns Google).

The potential negative cash return on equity can arise because:

1. Compensation for inflation is provided through indexation of the RAB, which generates cash in future periods rather than the current period.
2. A deduction is made to current revenues to ensure that inflation compensation does not occur twice.
3. Service providers typically use nominal debt rather than real debt.[297]

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294 Sapere, *Target return and inflation - Input to the AER Inflation Review 2020*, 30 June 2020, p. 30.

295 ENA, *Submission to discussion paper, inflation review 2020,* July 2020, p. 57.

296 Sapere, *Target return and inflation - Input to the AER Inflation Review 2020*, 30 June 2020, p. 30.

297 Under nominal debt the principal is repaid in nominal terms and interest payments implicitly include an allowance for inflation. Under real debt, such as indexed bonds, the principal repaid is indexed for inflation and a real interest rate that is net of expected inflation is paid.

The hybrid approach suggested by the ENA makes two adjustments. First, by using a five year estimate of expected inflation for the debt component of the return of capital building block, and second, by using this same estimate for the debt component of RAB growth in the RFM.

By changing our expected inflation term to match the length of the regulatory period (as discussed in chapter 10), the first component of the ENA's proposed change is achieved under our draft position.

The second part of the ENA's change does not adjust cash flows during the immediate regulatory period. As such, if there is a cash flow issue, then the ENA's proposed approach would not further alleviate it compared to our draft position.[298]

To further address the potential for negative cash returns on equity, future cash flows could be brought forward to the current regulatory period.[299] It should be noted, however, that such a change would bring forward charges to today's consumers. As at the draft position, we consider this undesirable due to intergenerational equity considerations and the current economic conditions.

We note that negative cash returns for equity are not considered an issue in NPV terms over the life of the assets due to the offsetting expected increases in RAB values.[300]

We also note that while Sapere recommended that we consider this issue it also recommended that we continue using our current approach.[301]

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298 The change to methodology suggested by ENA involves a deduction for inflation compensation for debt and equity still occurring during the regulatory period. This has the same properties as the current real rate of return approach (potential for negative cash return on equity).

299 An example of such a methodology change would be to reduce the deduction of inflation compensation during the regulatory period with an equivalent reduction in the eventual RAB indexation.

300 The set real rate of return is still appropriate if we have the best estimate of expected inflation and appropriate estimates for the required return on equity and return on debt.

301 Sapere, *Target return and inflation - Input to the AER Inflation Review 2020*, 30 June 2020, p. 30.

18 What happens from here?

We will hold a **stakeholder forum on 21 October 2020**. This forum will be held prior to the close of submissions on this draft positon paper. This will provide an opportunity for us to present our draft position and for interested stakeholders to be informed by the discussion at that forum.

We also invite interested parties to make written submissions regarding this paper by close of business on **6 November 2020**.

Interested parties should send submissions electronically to: inflationreview2020@aer.gov.au.

Alternatively, parties may mail submissions to:
Mr Warwick Anderson
General Manager, Network Finance and Reporting
Australian Energy Regulator
GPO Box 3131
Canberra ACT 2601

We prefer that all submissions be publicly available to facilitate an informed and transparent consultative process. We will treat submissions as public documents unless otherwise requested.

We request parties wishing to submit confidential information to:

- Clearly identify the information that is the subject of the confidentiality claim.
- Provide a non-confidential version of the submission in a form suitable for publication.

We will place all non-confidential submissions on our website at www.aer.gov.au. For further information regarding our use and disclosure of information provided to us, see the ACCC/AER Information Policy, June 2014 available on our website.

Please direct enquiries about this paper, or about lodging submissions, to InflationReview2020@aer.gov.au or to the Network Finance and Reporting branch of the AER on (03) 9290 1444.

We intend to release our final position in December 2020, after considering the submissions and any further evidence presented to us. In our final position we need to decide on the proposed positions in this paper, as well as any other options put to us in submissions. A key unanswered question in this paper is whether we need some form of transition if we move to an estimate of expected inflation that matches the length of the regulatory period from the ten year estimate we currently use.

If, following our final position, there is reason to amend the PTRM or RFM, we will publish our proposed amendment in early 2021 with an explanatory statement. There would be an additional consultation period on the proposed amendment and then we

would make a final decision on those amendments in April 2021.[302] These changes would be completed in time to apply to the final decisions for the Victorian electricity distribution determinations due by 30 April 2021. Any changes would not apply to regulatory decisions that have concluded.

18.1 Proposed change to PTRM to give effect to our draft position

While the position outlined in this paper is only a draft position, below we include possible text to change the PTRM to give effect to our draft position. We are interested in early stakeholder views, but note that further consultation is required under the rules to amend the PTRM that would occur in early 2021, once this review is complete.

> The estimate of expected inflation is calculated as the geometric average of expected inflation over the regulatory control period as follows:
>
> - the inflation forecasts for the longest period available from the latest available Reserve Bank of Australia's (RBA's) Statement on Monetary, and
> - later years' inflation expectations estimated by applying a linear glide-path from the last RBA inflation forecast to the mid-point of the RBA's target inflation band in the fifth year of the regulatory control period, and
> - the mid-point of the RBA's target inflation band for any remaining years.
> - If the RBA does not publish a forecast of inflation, inflation expectations estimated by applying a linear glide-path from the latest point estimate of inflation from the Australian Bureau of Statistics to the mid-point of the RBA's target inflation band in the fifth year of the regulatory period and the mid-point of the RBA's target band thereafter.

If we decide that a change to the regulatory framework is warranted, following further analysis and consultation, we would propose a rule change to the Australian Energy Market Commission (AEMC). The AEMC would then undertake its own consultation process to consider whether the rules should be changed. We do not expect the AEMC would complete its rule change process prior to our Victorian electricity distribution determinations due by 30 April 2021.

An updated indicative timeline for this review is set out below. We may further alter the timeline in response to emerging issues, including the ongoing management of COVID-19.

[302] The timetable would follow the legislated consultation procedures in order to align with NER cll. 6.4.1(b), 6.5.1(c), 6.16, 6A.5.2(b), 6A.6.1(c) and 6A.20 and NGR r. 75A.

Table 7 Indicative timeline

Date	Milestone
October 2020	Second consultation period
6 November 2020	Submissions on draft position paper close
December 2020	Final position paper
January 2021	(If required) Proposed PTRM/RFM amendments and explanatory statement released (If required) Six week submission period on proposed model amendments (If required) Proposed rule change process
April 2021	(If required) Final PTRM/RFM amendments released

A Rule requirements

This appendix sets out the relevant National Electricity Rules and National Gas Rules requirements.

Rule requirements on inflation estimation method

The inflation estimation method forms part of the post-tax revenue model under the NER and the revenue model under the NGR.

Under the NER, the AER is required to publish a post-tax revenue model for distribution network service providers and transmission network service providers (clauses 6.4.1 and 6A.5.2). Under the NGR, the AER is required to publish a revenue model (rule 75A).

Under the NER, a distribution network service provider's building block proposal and a transmission network service provider's revenue proposal must be prepared in accordance with the post-tax revenue model (clauses 6.3.1(c)(1) and 6A.4.1(b)(1)).

Under the NGR, the access arrangement information for a full access arrangement proposal must be provided using the financial models (including the revenue model) published by the AER, and all financial information must be provided, and all calculations made, using these models (rules 72(3) and 73(3)).

A post-tax revenue model under the NER and a revenue model under the NGR must include a method for estimating expected inflation.

Electricity distribution

6.4.2 Contents of post-tax revenue model

…

(b) The contents of the post-tax revenue model must include (but are not limited to):

(1) a method that the AER determines is likely to result in the best estimates of expected inflation; …

Electricity transmission

6A.5.3 Contents of post-tax revenue model

…

(b) the post-tax revenue model must specify:

(1) a methodology that the AER determines is likely to result in the best estimates of expected inflation; …

Gas rules

75B Contents of the financial models

…

(2) The revenue model must include (but is not limited to):

…

(b) the method that the AER determines is likely to result in the best estimates of expected inflation; …

Application of inflation under the NER

Under the NER, the building blocks for the annual revenue requirement for a distribution network service provider and the building blocks for the annual building block revenue requirement for a transmission network service provider must include indexation of the regulatory asset base and a negative adjustment equal to the amount indexation.

Electricity distribution

6.4.3 Building block approach

(a) Building blocks generally

The annual revenue requirement for a Distribution Network Service Provider for each regulatory year of a regulatory control period must be determined using a building block approach, under which the building blocks are:

(1) indexation of the regulatory asset base – see paragraph (b)(1); …

(b) Details of the building blocks

For the purposes of paragraph (a):

(1) for indexation of the regulatory asset base:

(i) the regulatory asset base is calculated in accordance with clause 6.5.1 and schedule 6.2; and

(ii) the building block comprises a negative adjustment equal to the amount referred to in clause S6.2.3(c)(4) for that year; …

Electricity transmission

6A.5.4 Building block approach

(a) Building blocks generally

The annual building block revenue requirement for a Transmission Network Service Provider for each regulatory year of a regulatory control period must be determined using a building blocks approach, under which the building blocks are:

(1) indexation of the regulatory asset base – see paragraph (b)(1); …

(b) Details of the building blocks

For the purposes of paragraph (a):

(1) for indexation of the regulatory asset base:

(i) the regulatory asset base is calculated in accordance with clause 6A.6.1 and schedule 6A.2; and

(ii) the building block comprises a negative adjustment equal to the amount referred to in clause S6A.2.4(c)(4) for that year; …

The regulatory asset base is indexed when rolling forward from one regulatory year to the next regulatory year within the same regulatory control period, and it is also indexed when rolling forward from one regulatory control period to the next regulatory control period.

At the time of determining the annual revenue requirement for distribution or the annual building block revenue requirement for transmission, actual inflation for the regulatory years in the upcoming regulatory control period is not known, and estimated inflation is used in indexing the regulatory asset base for the roll forward of the regulatory asset basis from one regulatory year to the next.

Electricity distribution

S6.2.3 Roll forward of regulatory asset base within the same regulatory control period

…

(c) Method of adjustment of value of regulatory asset base

The value of the regulatory asset base for a distribution system as at the beginning of the second or a subsequent year (the later year) in a regulatory control period must be calculated by adjusting the value (the previous value) of the regulatory asset base for that distribution system as at the beginning of the immediately preceding regulatory year (the previous year) in that regulatory control period as follows:

…

(4) The previous value of the regulatory asset base must be increased by an amount necessary to maintain the real value of the regulatory asset base as at the beginning of the later year by adjusting that value for inflation.

Electricity transmission

S6A.2.4 Roll forward of regulatory asset base within the same regulatory control period

…

(c) Method of adjustment of value of regulatory asset base

The value of the regulatory asset base for a transmission system as at the beginning of the second or a subsequent year (the later year) in a regulatory control period must be calculated by adjusting the value (the previous value) of the regulatory asset base for that transmission system as at the beginning of the immediately preceding regulatory year (the previous year) in that regulatory control period as follows:

…

(4) The previous value of the regulatory asset base must be increased by an amount necessary to maintain the real value of the regulatory asset base as at the beginning of the later year by adjusting that value for inflation.

The negative adjustment in the building blocks under clauses 6.4.3(b)(1)(ii) and 6A.5.4(b)(1)(ii) off-sets the indexation of the regulatory asset base. The effect of the negative adjustment is that conceptually the return on capital can be seen as calculated based on the real rate of return, derived from the rate of return determined under the rate of return instrument and the expected inflation.

When the regulatory asset base is rolled forward from one regulatory control period to the next regulatory control period, actual inflation is used to index the regulatory asset base.

Electricity distribution (emphasis added)

6.5.1 Regulatory asset base

...

Contents of roll forward model

...

(e) The roll forward model must set out the method for determining the roll forward of the regulatory asset base for distribution systems:

… under which …

(3) the roll forward of the regulatory asset base from the immediately preceding regulatory control period to the beginning of the first regulatory year of a subsequent regulatory control period entails the value of the first mentioned regulatory asset base being adjusted for actual inflation, consistently with the method used for the indexation of the control mechanism (or control mechanisms) for standard control services during the preceding regulatory control period.

Electricity transmission (emphasis added)

6A.6.1 Regulatory asset base

...

Contents of roll forward model

...

(e) The roll forward model must set out the method for determining the roll forward of the regulatory asset base for transmission systems:

… under which …

(3) the roll forward of the regulatory asset base from the immediately preceding regulatory control period to the beginning of the first regulatory year of a subsequent regulatory control period entails the

value of the first mentioned regulatory asset base being adjusted for outturn inflation, consistent with the methodology that was used in the transmission determination (if any) for the first mentioned regulatory control period for the indexation of the maximum allowed revenue during that regulatory control period.

Clauses 6.5.1(e)(3) and 6A.6.1(e)(3) refer to adjustment of the regulatory asset base for actual inflation, consistent with the methodology for the indexation of the control mechanisms for standard control services for distribution or the indexation of the maximum allowed revenue for transmission during the previous regulatory control period.

For both electricity distribution and transmission, the CPI - X methodology is used to index the allowed revenue.

Electricity distribution

6.2.6 Basis of control mechanisms for direct control services

(a) For standard control services, the control mechanism must be of the prospective CPI minus X form, or some incentive-based variant of the prospective CPI minus X form, in accordance with Part C.

Electricity transmission

6A.5.3 Contents of post-tax revenue model

…

(b) The post-tax revenue model must specify:

…

(5) the CPI-X methodology that is to be applied in escalating the maximum allowed revenue for the provider for each regulatory year (other than the first regulatory year) of a regulatory control period.

Clauses 6.5.1(e)(3) and 6A.6.1(e)(3) have the effect that the actual inflation used to index the regulatory asset base in rolling forward the regulatory asset base from one regulatory control period to the next is also used to index the allowed revenue.

The effect of the provisions relating to inflation discussed above is that conceptually the return on capital from the second regulatory year onwards can be seen as calculated based on the real rate of return (derived from the rate of return determined under the rate of return instrument and the expected inflation) compounded up for actual inflation.

The application of inflation under the NGR

The NGR is less prescriptive regarding inflation. It does not expressly state how the capital base is to be indexed and it does not expressly refer to a negative adjustment in the building block revenue to account for the indexation of the capital base.

The following provisions in the NGR relate to inflation estimates and application of inflation.

In the context of access arrangement information, rule 74 requires forecasts and estimates to represent the best forecast or estimate possible in the circumstances. This requirement applies to inflation estimates.

74 Forecasts and estimates

(1) Information in the nature of a forecast or estimate must be supported by a statement of the basis of the forecast or estimate.

(2) A forecast or estimate:

(a) must be arrived at on a reasonable basis; and

(b) must represent the best forecast or estimate possible in the circumstances.

Adjustment for inflation is specifically mentioned in the NGR in the context of depreciation.

89 Depreciation criteria

(1) The depreciation schedule should be designed:

…

(d) so that (subject to the rules about capital redundancy), an asset is depreciated only once (i.e. that the amount by which the asset is depreciated over its economic life does not exceed the value of the asset at the time of its inclusion in the capital base (adjusted, if the accounting method approved by the AER permits, for inflation)); …

National electricity/gas objective and revenue and pricing principles

The national electricity objective, the national gas objective and the revenue and pricing principles in the NEL and NGL are relevant to the AER's decisions regarding inflation.

16 Manner in which AER performs AER economic regulatory functions or powers

(1) The AER must, in performing or exercising an AER economic regulatory function or power—:

(a) perform or exercise that function or power in a manner that will or is likely to contribute to the achievement of the national electricity objective;

…

(2) In addition, the AER—

(a) must take into account the revenue and pricing principles—

(i) when exercising a discretion in making those parts of a distribution determination or transmission determination relating to direct control network services; …

(b) may take into account the revenue and pricing principles when performing or exercising any other AER economic regulatory function or power, if the AER considers it appropriate to do so.

Equivalent provisions are included in section 28 of the NGL.

The national electricity objective is stated in the NEL as follows.

7 National electricity objective

The objective of this Law is to promote efficient investment in, and efficient operation and use of, electricity services for the long term interests of consumers of electricity with respect to—

(a) price, quality, safety, reliability and security of supply of electricity; and

(b) the reliability, safety and security of the national electricity system.

The national electricity objective is stated in the NGL as follows.

23 National electricity objective

The objective of this Law 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.

The relevant revenue and pricing principles set out in section 7A of the NEL are as follows.

7A Revenue and pricing principles

…

(2) A regulated network service provider should be provided with a reasonable opportunity to recover at least the efficient costs the operator incurs in—

(a) price, quality, safety, reliability and security of supply of electricity; and

(b) the reliability, safety and security of the national electricity system.

(3) A regulated network service provider should be provided with effective incentives in order to promote economic efficiency with respect to direct control network services the operator provides. The economic efficiency that should be promoted includes—

(a) efficient investment in a distribution system or transmission system with which the operator provides direct control network services; and

(b) the efficient provision of electricity network services; and

(c) the efficient use of the distribution system or transmission system with which the operator provides direct control network services.

…

(5) A price or charge for the provision of a direct control network service should allow for a return commensurate with the regulatory and commercial risks involved in providing the direct control network service to which that price or charge relates.

(6) Regard should be had to the economic costs and risks of the potential for under and over investment by a regulated network service provider in, as the case requires, a distribution system or transmission system with which the operator provides direct control network services.

Equivalent revenue and pricing principles are included in section 24 of the NGL.

B Best estimate background

This appendix includes background information on the wording 'best estimate' which we have used to determine the expected inflation included in our regulatory framework. The specific wording was introduced in response to a submission and therefore it is informative to examine how this exact wording came about and what this implies.

In the 2006 rule change process, the draft rule proposed by the AEMC was:[303]

> The model referred to in clause 6.2.1(a) must specify:
>
> (1) the manner in which the expected rate of inflation over the relevant regulatory period is to be calculated;

In response, the Electricity Transmission Network owner's forum, whose members consisted of TransGrid, ElectraNet, Powerlink, Transend and SP AusNet, suggested it should reflect a 'best estimate' stating:[304]

> The TNOs consider that the Rules should direct the inflation forecast that is adopted to reflect a 'best' forecast, which in turn would imply that it uses the latest information available, adopts the best techniques and considers reliable evidence. A more technical specification would be to require the forecast to be a 'statistically unbiased' forecast.
>
> The TNOs note that the dominant method that is used by Australian regulators to forecast inflation is to use the difference between the yield on the nominal government bond rate and the yield on the inflation-linked bonds of the same term to maturity. While the TNOs do not consider that this method necessarily should be precluded, it would be highly inappropriate for the Rules to prescribe the use of inflation-linked bonds (unadjusted) to obtain the forecast of inflation.
>
> It is well recognised that the market for inflation linked bonds is very small and is expected to decline in volume over time. This means that the observed yields may not provide an accurate reflection of the real risk free rate if unusual events occur. Indeed, the Victorian Essential Services Commission has adjusted the observed yield on inflation linked bonds for expected biases in both of its reviews of the price controls for the Victorian electricity distributors. Moreover, it has been noted in a number of submissions that part of the difference between nominal and real bonds will reflect an inflation risk premium, which means that the difference between these bond yields will overstate expected future inflation. Even if this inflation risk premium (and hence the upward bias in inflation forecasts) has been low in recent years, it would become material if inflation began to rise. Accordingly, the TNOs consider that the method that is used to forecast inflation should be a matter that is left to be resolved in the context of reviews of revenue caps, having regard to the best evidence available at that time.

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[303] AEMC, *Draft National Electricity Amendment (Economic Regulation of Transmission Services) Rule 2006*, cll.6.2.1(c)(1), February 2006, pp. 12-13.

[304] Electricity Transmission Network Owners Forum, *AEMC Review of the Electricity Transmission Revenue and Pricing Rules: Rule Proposal and Rule Proposal Report – Submission by the Electricity Network Owners Forum*, March 2006, pp. 24-25.

In response to submissions, the AEMC's second draft rule changed wording on the inflation provision to:[305]

> The post-tax revenue model must specify a method the AER determines is likely to result in the best estimate of expected inflation.

In explaining the change, the AEMC stated:[306]

> The Commission notes the concerns raised by the AER and the ETNOF on the lack of guidance in the Proposed Rule as to the methodology the AER should adopt to forecast inflation over the regulatory period, and the concern expressed by the ETNOF that the use of inflation-linked bonds (unadjusted) to obtain a forecast of inflation would be inappropriate.
>
> As a result the Commission has decided that the Rules should require the AER to specify as part of the PTRM the methodology that the AER determines is likely to result in 'the best estimates of expected inflation. The Commission considers that this approach provides the AER with some discretion but requires that the inflation forecast be the best available.

[305] AEMC, s. 6A.6.5.3(b)(1).

[306] AEMC, *Draft Rule Determination Draft National Electricity Amendment (Economic Regulation of Transmission Services) Rule* 2006, July 2006, p. 95.

C Response to submissions on best estimate of inflation (issue 1)

This appendix includes our detailed response to stakeholder submissions on 'Issue 1' in the discussion paper.

Table C.1 Our response to submissions on issue 1

Comment in Submission	Our Response
Consumer Groups	
The CRG's submission provided that the RBA approach best satisfies the fundamental regulatory principles and their additional principles, but noted the options of modifying the RBA method by using a glide-path approach.[307] In investigation the use of a glide-path, the CRG noted a number of key questions for the AER to address in the investigation.[308]	In making our draft position we have investigated how a glide-path would be implemented by proposing the use of a glide-path over a five year horizon. We considered the questions raised by the CRG and assessed that a five year horizon would address the volatility between actual and expected inflation and that a linear approach would be used based on its simplicity. In addressing the other questions, we note the glide-path addresses the current market position for inflation and that the effects of the glide-path when the short-term forecasts are within or slightly outside the RBA's target band would result in minimal difference to the current approach over a five year horizon. We note that in his report to the AER, Dr Lally recommended that if symmetry of reversion speed exists then we should retain our current approach. This is because the error in the estimate will average out over multiple periods and result in an NPV neutral outcome if slow reversion is in fact symmetric. We consider the same argument applied by Dr Lally to recommend maintaining the current approach—that on average the error will be offset—can likewise be used to recommend a symmetric glide-path.
The ECA's submission stated that the AER should not change their current regulatory framework to estimate expected inflation.[309] The ECA noted that the AER's task is not to forecast inflation, but to derive a 'best estimate of expected inflation,' with best being the method which promotes the long-term interests of consumers.[310]	Our draft position to propose the use of a glide-path over a five year horizon is based on our assessment that this method will produce the best estimate of expected inflation. There is evidence that the transition back to the mid-point of the RBA's target band may take longer than the approach we currently employ, and the current method needs to be replaced. The glide-path is based on the proposition that it may take a number of years for inflation to return to the mid-point of the RBA's target band following a disturbance. It is the evidence of a disturbance provided in chapter 12 and the advice provided by consultants (Dr Lally and Deloitte), which has directed our proposed draft position.

307 CRG, *Submission to discussion paper, inflation review 2020*, July 2020, p. 22.
308 CRG, *Submission to discussion paper, inflation review 2020*, July 2020, p. 22.
309 ECA, *Submission to discussion paper, inflation review 2020*, July 2020, pp. 2-3.
310 ECA, *Submission to discussion paper, inflation review 2020*, July 2020, pp. 2-3.

Comment in Submission	Our Response
Service Provider and Industry Groups	
The ENA noted that there were issues with our current approach for estimating expected inflation. The ENA noted that the RBA method has an assumption that inflation is expected to be 2.5 per cent in year 3 (FY23) and every year thereafter. The ENA stated that this assumption is currently unreasonable, with no evidence supporting this notion, only against this proposition.[311]	Our draft position notes that there is evidence that the transition back to the mid-point of the RBA's target band may take longer than two years. The evidence to support this is provided in chapter 12. In response to this, our draft position involves using a linear glide-path approach over a shorter inflation time horizon to estimate expected inflation.
The ENA's submission cited market-based measures as alternative sources to be considered to estimate expected inflation. The ENA noted that market-based measures are entirely appropriate for regulatory purposes as they exactly replicate the treatment of inflation in the regulatory model.[312] Further, the ENA noted that inflation swaps as a type of market-based measure, have prices that are set by sophisticated market participants where there is real money at stake and therefore there is a strong incentive for the parties to adopt a reasonable estimate of inflation.[313]	Our draft position is not to use market-based measures as a method for estimating expected inflation in our draft position. This is primarily due to the biases and distortions within the measure, which diminish its use in providing estimated inflation in our regulatory framework. In our 2017 Inflation Review we assessed that inflation swaps and the bond break-even approach were not viable as methods to estimate expected inflation. The bond break-even approach was likely to incorporate biases and premiums which are significant and time varying in their estimates. Likewise the estimates from the inflation swaps methods are likely to incorporate biases and distortions (due to hedging costs, liquidity premium and other premiums) and these biases and distortions were time varying. We note that the argument that real money is at stake in markets for inflation is the very reason why these markets are affected by liquidity premia, inflation risk premia, indexation lag and the other issues raised in the 2017 Inflation Review (provided in Appendix A). The ENA did not provide any evidence that demonstrated that market-based measures are less affected by these issues determined in the 2017 inflation review.
The ENA's submission provided that our current approach produces results that are inconsistent with market evidence, as our calculated real risk free rate is below that observed on indexed yields on CGS.[314]	We note that our final position in the 2017 Inflation Review provided considerable evidence[315] with respect to liquidity and inflation risk premia that observed indexed and nominal yields on CGS are subject to various premia, biases and distortions. This was also echoed in the expert advice of Deloitte and Dr Lally. Deloitte and Dr Lally respectively provided that: • Market-based measures were affected by the presence of material and time varying distortions that limit their use in a regulatory context;[316] and

311 ENA, *Submission to discussion paper, inflation review 2020*, July 2020, pp. 35-38.
312 ENA, *Submission to discussion paper, inflation review 2020*, July 2020, pp. 45-46.
313 ENA, *Submission to discussion paper, inflation review 2020*, July 2020, pp. 43.
314 ENA, *Submission to discussion paper, inflation review 2020*, July 2020, pp. 40-41.
315 AER, *Regulatory treatment of inflation: Final position*, December 2017.
316 Deloitte Access Economics, *Review of the regulatory treatment of inflation*, 30 June 2020, pp. 7-10.

Comment in Submission	Our Response
	• market prices (comprising the break-even rates and swap prices) are likely to be biased estimates of expected future inflation and time varying.[317]
The ENA submitted that the role of the inflation parameter within the AER's framework is identical to inflation swaps and BBIR since what is required is an estimate of the price of converting a nominal return into a real one.[318]	We note that such an approach would cause a number of issues: • The inflation estimates from inflation swaps are likely to be different from the bond break-even given that the differences in the magnitude and type of premia, biases and distortions. Converting from nominal to real returns will give different real estimates based on the market measures used. • Inflation swaps and the bond break-even are unlikely to be the best estimates of expected inflation under the NER or NGR. The ENA or any other stakeholder have not provided convincing evidence or has undertaken best practice decomposition studies that either removes the premia, biases and distortions from the market-based measures or demonstrated these premia, biases and distortions are negligible. • This implies that the inflation risk premium should be included in our inflation estimate to achieve a target real return. This inflation risk premium, with the other premia, biases and distortions in market-based measures are unlikely to be the best estimate of expected inflation.
APGA's submission noted that market-based measures 'ought to play a bigger role, even if the RBA forecasts remain in use for the short-term forecasts. APGA considered that the swap rate is the more apt market-based measure, not because of any improvement in predictive performance, but rather because it produces the same result that the AER is seeking, with less volatility for networks and consumers.[319]	We note that there is no evidence or modelling provided by stakeholders or our experts which would suggest that market measures are less affected by biases, distortions or volatility than assessed in our 2017 inflation review. On this basis we have decided not to use market-based measures as a method for estimating expected inflation in our draft position.
APGA's submission provided a list of 24 studies which find premia, biases and distortions in the bond break-even.[320] APGA noted that these surveys whilst ranked last as a method for estimating inflation in the 2017 Inflation Review are used as proxy to assess the bond break-even.[321]	We note that these 24 studies reinforce the view that there is broad acceptance among central bankers and academics that market-based measures contain a number of potentially significant (and time varying) premia, distortions and biases. Further, the widespread use of survey estimates demonstrates widespread confidence by academics and central banks community that these estimates closely correspond to expected inflation. We also note that our assessment on surveys in the 2017 Inflation Review was based primarily on surveys being proprietary and not publicly available preventing a comprehensive assessment to be undertaken on the

317 Dr Martin Lally, *Review of the AER's Inflation Forecasting Methodology*, 8 July 2020, pp. 31-32.
318 ENA, *Submission to discussion paper, inflation review 2020*, July 2020, pp. 42-45, 48-49.
319 APGA, *Submission to discussion paper, inflation review 2020*, July 2020, p. 11.
320 APGA, *Submission to discussion paper, inflation review 2020*, July 2020, pp. 10-11.
321 APGA, *Submission to discussion paper, inflation review 2020*, July 2020, pp. 10-11.

Comment in Submission	Our Response
	data.[322] In making our final position, we noted that we would use surveys from Consensus Economics to monitor whether there had been any potential de-anchoring from the RBA target band.[323]
Other Groups	
Aurizon stated that the AER should consider alternative "hybrid" approaches to estimating expected inflation, rather than the current approach of short-term forecasts and the long-term inflation target. Aurizon suggested that the AER should test the reliability of medium-term estimates of expected inflation having regard to the liquidity of inflation–linked bonds and the recent assessment of these bonds by IPART and the ERA.[324] Aurizon's submitted that the RBA's second year forecasts used in the current approach are 'consistently overestimated forecast inflation and that the cumulative error is significant.' Further, Aurizon noted that the reliability of the RBA's forecasts call into question both • the underlying assumption that inflation reverts to the mid-point of the RBA's target band by year 3;[325] and • whether long-term inflation expectations are still anchored at 2.5 per cent, or whether they should be lower than the RBA target band.[326]	We note that there has been no new evidence provided by stakeholders or our experts that market-based measures are less affected by biases, distortions or volatility than assessed in our 2017 inflation review. Due to this, we have decided not to use bond break-even as a method for estimating expected inflation in our draft position. The issues raised by Aurizon of inflation reverting to the mid-point of the RBA's band by year 3, have been addressed in our draft position to use a glide-path approach and to estimate expected inflation over a five year horizon. This approach will enable the estimate of expected inflation to be more responsive to short-term inflation forecasts.

322 AER, *Regulatory treatment of inflation: Final position*, December 2017, pp. 54-55.
323 AER, *Regulatory treatment of inflation: Final position*, December 2017, p. 48.
324 Aurizon, *Submission to AER Review of Inflation*, 31 July 2020, pp. 3-4.
325 Aurizon, *Submission to AER Review of Inflation*, 31 July 2020, p. 6.
326 Aurizon, *Submission to AER Review of Inflation*, 31 July 2020, pp. 8-11.

D Regulatory Economics Unit response to submissions on best estimate of inflation (issue 1)

This appendix provides the Regulatory Economics Unit's (REU) detailed commentary and response to stakeholder submissions on 'Issue 1' in the discussion paper. REU is the ACCC's in-house provider of economic specialist support.

Table D.1 REU's response to submissions on issue 1 by stakeholders

Submitter	REU Comments
Consumer Groups	
CRG	The CRG[327] stated that at this stage it does not believe a sufficiently strong case has been made to indicate a sustained period of average 10 year inflation that is materially below AER's current estimates. Therefore, a reconsideration and change in the methodology for estimating long-term expected inflation is not warranted. REU observes that given the stakeholder input, findings of the literature, Deloitte[328] and Lally,[329] the scope for the reconsideration of approaches is more confined than that envisaged by many stakeholders. Stakeholders have not provided sufficient studies and evidence that market-based measures of expected inflation are best estimates of expected inflation. REU considers that stakeholder submissions strengthen the case against market-based measures by (1) proposing methods to adjust for bias (2) suggesting weighted market measures based on the inverse correlation between their *premia* (3) Ausgrid's consultant advising against the use of the BBIR (First Economics) and (4) surveying studies which find premia, biases and distortions in market-based measures. The CRG observed that historical data on headline inflation over the last 25 years supports the view that inflation has to date centred on the RBA's target band. REU notes that CRG's observations are corroborated by the findings of Lally.[330] REU also notes that the CRG's reference to the May 2020 Statement on Monetary Policy – where the RBA stated that long-term survey expectations remain within the inflation target – coheres with the findings of Deloitte (2020)[331] (particularly Deloitte finding no evidence of a de-anchoring of long-term inflation expectations from the RBA target band) and Lally[332] that give effect to: the credibility of survey expectations, evidence of the relative stability of long-term inflation expectations and a consideration that estimates of longer term inflation expectations should still be estimated with reference to the RBA inflation target. REU acknowledges the CRG's provision of further and more contemporaneous information on the bond markets and its consideration of the premia, biases and distortions in market-based measures. The volatility and change in market depth of the 10 year nominal CGS suggests that

327 CRG, *Submission to discussion paper, inflation review 2020*, July 2020.

328 Deloitte Access Economics, *Review of the regulatory treatment of inflation*, 30 June 2020.

329 Dr Martin Lally (Capital Financial Consultants Ltd), *Review of the AER's inflation forecasting methodology*, 8 July 2020.

330 Dr Martin Lally (Capital Financial Consultants Ltd), *Review of the AER's inflation forecasting methodology*, 8 July 2020.

331 Deloitte Access Economics, *Review of the regulatory treatment of inflation*, 30 June 2020.

332 Dr Martin Lally (Capital Financial Consultants Ltd), *Review of the AER's inflation forecasting methodology*, 8 July 2020.

Submitter	REU Comments
	the BBIR includes considerable premia, biases and distortions since – given the large number of studies into the BBIR – the observed volatility is unlikely to be fully explained by changes in inflation expectations. The CRG expressed reservations about market-based measures given their premia, biases and distortions. REU considers that the CRG's reservations are not unfounded and is supported by the findings of Deloitte,[333] Lally[334] and an extensive literature on the BBIR and zero coupon inflation swaps by central bankers, academics and market practitioners. In 2007 the ENA expressed concerns about the bias in the BBIR.[335]
ECA	Energy Consumers Australia (ECA)[336] stated that the prudent option is that the estimate of expected inflation should be set at the top of the RBA's target range. The ECA referred to a report by Professor Quiggin which supported this position.[337] This report was submitted during the 2017 AER inflation review. The Quiggin report that accompanied ECA's submission suggested setting estimated inflation at the top of the RBA's target band appropriately allocates inflation risk to investors. The purpose is to protect consumers from 'upside' inflationary risk by setting the estimate of expected inflation at the upper end of the range. However, Quiggin presents no evidence or study to corroborate the claim that expected inflation should be at the top of the RBA's target band. However, Lally[338] presents evidence that the midpoint of the RBA target band performs well. Lally finds that across a range of approaches considered, the RBA's target is far superior to the use of market prices for forecasting inflation over a 5-10 year period. REU also refers to the final paragraph in its response to the CRG's submission above. [339]
EUAA	REU concurs with the EUAA[340] that good regulatory practice and minimum regulatory risk is built on consistency and predictability and therefore, there must be sound reasons for the AER to change its current approach in estimating expected inflation. REU considers that unless the raw implied inflation estimates of the BBIR or zero coupon inflation swaps are considered best estimates of expected inflation (consistent with the NER/NGR) there is no merit to assessing the impact of the BBIR on allowed revenues and prices. Both Lally[341] and Deloitte[342] have provided considerable evidence that the BBIR and zero coupon inflation swaps are methods that are unlikely to result in best estimates of expected inflation. On the EUAA's stated preference for data for the 10-15 years prior to 2015, REU recommends that EUAA review Lally.[343] Lally's assessment of the forecast performance of many approaches is over a sample period from 1994 (just after inflation targeting is introduced) to 2019. Lally finds that across a range of approaches considered, the RBA's target is far superior to the use of market prices for forecasting inflation over a 5-10 year period.

333 Deloitte Access Economics, *Review of the regulatory treatment of inflation*, 30 June 2020.

334 Dr Martin Lally (Capital Financial Consultants Ltd), *Review of the AER's inflation forecasting methodology*, 8 July 2020.

335 NERA Economic Consulting, *Bias in the indexed CGS yields as a proxy for the CAPM risk free rate*, *A report for the ENA,* March, pp. 5-50.

336 ECA, *Submission to discussion paper, inflation review 2020*, July 2020.

337 ECA, *Regulatory treatment of inflation: Response to AER discussion paper*, June 2017.

338 Dr Martin Lally (Capital Financial Consultants Ltd), *Review of the AER's inflation forecasting methodology*, 8 July 2020.

339 Deloitte Access Economics, *Review of the regulatory treatment of inflation*, 30 June 2020.

340 EUAA, *Submission to discussion paper, inflation review 2020*, July 2020.

341 Dr Martin Lally (Capital Financial Consultants Ltd), *Review of the AER's inflation forecasting methodology*, 8 July 2020.

342 Deloitte Access Economics, *Review of the regulatory treatment of inflation*, 30 June 2020.

343 Dr Martin Lally (Capital Financial Consultants Ltd), *Review of the AER's inflation forecasting methodology*, 8 July 2020.

Submitter	REU Comments
	REU also refers to the final paragraph in its response to the CRG's submission above.
Fairbane Group	The Fairbane Group's[344] submission does not discuss the issue of expected inflation. REU considers that the contents of this submission are outside the scope of this review.
MEU	The Major Energy Users Inc. (MEU)[345] stated that market-based approaches may contain bias since they tend to deliver outcomes biased to give protection for the provider. REU's interpretation of this concern is that because participants in the market for inflation may lose money if actual inflation differs from market inflation expectations, there may be bias in the form of the cost of inflation risk. If REU's interpretation is correct, REU agrees with the position of the MEU. Because participants in financial markets buy and sell assets whose cash flows are nominal and may be subject to inflation risk, there may be biases in the form of inflation risk premia which may compensate the purchaser of the asset (negatively or positively) for the uncertainty of actual inflation. Although REU notes that there a number of premia, biases and distortions that may also drive a wedge between market-based measures and best estimates of expected inflation. The MEU further stated that neither the market-based measures nor the glide-path approach is likely to generate an estimate of expected inflation that is more accurate than the AER's current approach. While various glide-path approaches have not been tested, the MEU's argument in relation to the market-based approach and the AER's current approach is corroborated by the findings of Lally.[346] Lally finds that across a range of approaches considered, the RBA's target is far superior to the use of market prices for forecasting inflation over a 5-10 year period. REU also refers to the final paragraph in its response to the CRG's submission above.
PIAC	The Public Interest Advocacy Centre (PIAC)[347] stated that it is not convinced of the need to change the current regulatory treatment of inflation. REU considers that the method adopted should be the most likely to result in best estimates of expected inflation (as in the case of the NER) or that the estimate must be arrived at on a reasonable basis and must represent the best forecast or estimate possible in the circumstances (as in the case of NGR).[348] REU also notes that for it to change its position on expected inflation, stakeholders have to provide evidence and/or studies to support their alternative position. On the basis of current submissions, the AER remains unconvinced that market-based measures provide better estimates of expected inflation than the AER's current estimates.
Dr Ron Ben-David	REU has examined Dr Ben-David's[349] submission in detail and with interest. The requirement under the NER/NGR is best described as the first of Dr Ben-David's 'guardrails', where economic and financial concepts including empirical evidence is employed to determine which method is likely to result in best estimates of expected inflation. Since Dr Ben-David's exposition is a rethink of and proceeds beyond the first of his guardrails, REU considers this submission is beyond the scope for the current consideration of expected inflation under the NER/NGR. However, the approach proposed could be considered in a broader review of the operation of the regulatory framework or incentive schemes.

344 Fairbane Group, *Submission to discussion paper, inflation review 2020*, July 2020.

345 MEU, *Submission to discussion paper, inflation review 2020*, July 2020.

346 Dr Martin Lally (Capital Financial Consultants Ltd), *Review of the AER's inflation forecasting methodology*, 8 July 2020.

347 PIAC, *Submission to discussion paper, inflation review 2020*, July 2020.

348 NER cll. 6.4.2(b)(1) and NGR r. 74(2)(a) and 74(2)(b).

349 Dr Ron Ben-David, *Submission to discussion paper, inflation review 2020*, July 2020.

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Service Provider and Industry Groups	
APGA	APGA[350] submitted that the zero coupon inflation swap rate is a best estimate of inflation. However, APGA conceded that market-based measures may not be correct measures of expected inflation in isolation, but the key issue is what the AER is endeavouring to achieve. The NER/NGR requires that the AER to determine a method that is likely to result in best estimates of expected inflation or that the estimate is the best forecast or estimate possible in the circumstances.[351] And in the absence of AGPA or other stakeholders providing robust decomposition estimates of market-based measures consistent with best practice in the literature, REU considers that market measures are not best estimates of expected inflation. In Appendix A of its submission, APGA provided a list of 24 studies which find premia, biases and distortions in the BBIR. APGA attempted to cast doubt on the credibility of these studies by arguing that they are simply based on survey estimates or that for other studies names have been given to the errors of market measures such as 'liquidity bias'. APGA further submitted that AER ranked surveys last in its 2017 review. REU has four remarks. First, the APGA's survey of the literature reinforces the view that there is broad acceptance among central bankers and academics that market-based measures contain a number of potentially significant (and time-varying) premia, distortions and biases. Note that when a larger survey of literature is considered, it also encompasses the findings of bias by market practitioners. For example in 2007, NERA, on behalf ENA, argued that a bias existed in the BBIR and that the BBIR as an estimate of expected inflation should be reconsidered.[352] Second, there are also many studies that do not use information from survey expectations of inflation as APGA observed. APGA also noted that in many studies, well-established liquidity proxies (see Fleming[353]) can also significantly explain the variation of the BBIR, suggesting that the relative illiquidity of indexed bonds have a significant impact on the BBIR. Third, the widespread use of survey estimates demonstrates widespread confidence by academic and central bank community that these estimates closely correspond to expected inflation. Deloitte[354] cites research suggesting that survey estimates are a useful cross check of RBA forecasts. Deloitte finds that surveys rank highly in terms of relative congruence as professional forecasters invest substantial time and effort to ensure that their models track relevant changes in information relating to the formation of inflation expectations. Lally,[355] Faust and Wright and Kozicki and Tinsley find that survey estimates are either reasonable estimates of inflation expectations and/or perform better than the BBIR/yield based proxies.[356]

350 APGA, *Submission to discussion paper, inflation review 2020*, July 2020.

351 NER, cll. 6.4.2(b)(1) and NGR, r. 74(2)(a) and 74(2)(b).

352 NERA Economic Consulting, *Bias in the indexed CGS yields as a proxy for the CAPM risk free rate*, *A report for the ENA,* March 2007, pp. 5-50.

353 Michael Fleming, 'Measuring Treasury Market Liquidity', *Federal Reserve Bank of New York Economic Policy Review*, September 2003.

354 Deloitte Access Economics, *Review of the regulatory treatment of inflation, 30 June 2020*. For a survey of premia, biases and distortions in market-based measures see also AER, *Regulatory treatment of inflation: Final position*, December 2017; Hayden Mathysen, *Best Estimates of Expected Inflation: comparative assessment of four methods*, ACCC/AER Working Paper Series, No. 11, 2017.

355 Dr Martin Lally (Capital Financial Consultants Ltd), *Review of the AER's inflation forecasting methodology*, 8 July 2020.

356 Jon Faust and Jonathan Wright, 'Forecasting inflation', Working Paper, Department of Economics, Johns Hopkins University, 2012, pp. 1–80; Sharon Kozicki and P.A. Tinsley, 'Effective Use of Survey Information in Estimating the

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	Finally, REU clarifies APGA's statement about the AER's position on surveys in 2017. Surveys may be superior proxies for expected inflation except that survey data is proprietary in nature and at the time a comprehensive assessment of the data could not be undertaken. APGA maintained that the 'laundry list' of other premia, biases and distortions aside from inflation risk premia and liquidity premia are fairly small and are likened to a distraction. REU is concerned that APGA has not provided any evidence to support this claim, particularly given the extensive literature on these various premia, biases and distortions. In any case, REU notes that APGA has not considered that factors other than inflation risk premia and liquidity premia was the basis for ENA arguing in 2007 that a bias existed in the BBIR (excess demand for indexed CGS).[357] Moreover, Ausgrid's consultant, First Economics,[358] warns against readoption of the BBIR on the basis of similar findings in the UK market. First Economics finds that distortions in the supply and demand render the UK BBIR 'meaningless'. REU is also concerned with the approach taken by APGA of the findings Australian and international studies. The concern largely arises for two reasons. First, APGA has not undertaken any research to support its claims. Second and relatedly, APGA has not submitted its own peer reviewed study where its doubt of the credibility of all these studies is itself accepted as credible among the relevant scholars, central bankers and market practitioners. REU also considers that APGA has not presented a comprehensive positive case for market-based measures and why they correspond to a best estimate of expected inflation. Given the literature and best practices cited by APGA in Appendix A, a positive case would require it to undertake decomposition studies to support its claim that market-based measures are consistent with the NER/NGR. APGA's decomposition studies should also support its claim that the large number of other premia, biases and distortions – aside from that of the inflation risk premia and liquidity premia – are insignificant. Without evidence to the contrary, these other premia, biases and distortions cannot be disregarded and may be significant.
ATCO	ATCO[359] supported material weight being given to market-based estimates – the BBIR and zero coupon inflation swaps. ATCO submitted that such methods are more consistent with real and nominal rates, are unbiased and allow for the recovery of efficient costs. ATCO compared the forecast accuracy of the BBIR and the AER's current method over the period December 2010 to December 2019 and found that the BBIR is more accurate. We refer ATCO to Lally, which is instructive for correctly considering a larger period that commences near the start of inflation targeting in 1994 to 2019. Lally finds that the BBIR performs relatively poorly in terms of forecast accuracy.[360] Since there is considerable evidence that the BBIR contains premia, biases and distortions,[361] there is more likely to be bias in the determination of real rates when using the BBIR (or zero

Evolution of Expected Inflation', *Journal of Money Credit and Banking*, 44(1), 2012, pp. 146-147. See also: AER, *Regulatory treatment of inflation: Final position*, December 2017; Hayden Mathysen, *Best Estimates of Expected Inflation: comparative assessment of four methods*, ACCC/AER Working Paper Series, No. 11, 2017.

357 NERA Economic Consulting, *Bias in the indexed CGS yields as a proxy for the CAPM risk free rate*, *A report for the ENA,* March, pp. 5-50, 2007.

358 First Economics, *The AER's Inflation Review A report prepared for Ausgrid*, June 2020.

359 ATCO, *Submission to discussion paper, inflation review 2020*, July 2020.

360 Dr Martin Lally (Capital Financial Consultants Ltd), *Review of the AER's inflation forecasting methodology*, 8 July 2020.

361 See for example: Andrew Ang, Geert Bekaert and Min Wei, 'Do Macro Variables, Asset Markets or Surveys Forecast Inflation Better?' *Journal of Monetary Economics*, 54, 2007, pp. 1163–1212; Andrew Ang, Geert Bekaert and Min Wei, 'The Term Structure of Real Rates and Expected Inflation', *The Journal of Finance*, 63(2), 2008, April, pp. 797–849; Kodjo Apedjinou, Priya Misra and Anshul Pradhan, A TIPS Valuation Framework, Fixed Income Research, U.S. Interest Rate Strategy, Lehmann Brothers, 2006, pp. 1–20; Banco Central do Brasil, 'Breaking the Break-even Inflation Rate', Inflation Report, December, 2014, pp. 18–21; David Barr and John Campbell, 'Inflation, Real Interest Rates and the Bond Market: A Study of UK Nominal and Index-Linked Government Bond Prices', *NBER Working Paper*, 5821, 1996, pp. 1–35; Geert Bekaert and Xiaozheng Wang, 'Inflation Risk and the Inflation Risk Premium',

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	coupon inflation swaps) than when using non-market-based measures. Deloitte[362] noted that BBIR may be based on estimates of yields rather than observed yields, so that the BBIR-implied estimates of inflation can depend on the subjective choice of yield curves. We consider that ATCO, to support its proposition that market-based measures are unbiased, needs to undertake decomposition studies that are consistent with best practice to demonstrate that BBIR are negligible, such that the raw BBIR is closely consistent with the NER/NGR.[363] However, REU notes that ATCO has not undertaken these studies.
Ausgrid	Ausgrid[364] submitted that it is expecting more than 10 years of inflation below that dictated by the current methodology leading to long-term asymmetry. However, Ausgrid does not provide any evidence or studies to support this claim. Ausgrid referred to the ENA submission on its case for market-based measures of expected inflation. Deloitte finds that: • The AER's current approach is highly robust, transparent, replicable and simple and is sufficiently congruent with current 10 year market expectations of inflation. • Surveys rank highly in terms of relative congruence as professional forecasters invest substantial time and effort to ensure that their models track relevant changes in information relating to the formation of inflation expectations. • The implied inflation estimates from market-based measures are affected by material and time-varying distortions that limit their use in a regulatory context. • That on the basis of the current data and literature the AER's approach is still fit for purpose give the lack of clear evidence of the de-anchoring of inflation expectations from the inflation target range. Lally finds that across a range of approaches considered, the RBA's target is far superior to the use of market prices for forecasting inflation over a 5-10 year period. Further, across a range of other approaches that include RBA forecasts, forecasts from Consensus Economics, RBA's target rate, a Random Walk model, a mean reversion model and the model of Finlay and Wende, the lowest RMSE of the forecast errors comes from the RBA's forecasts for the first and second years ahead and the RBA's target for all other future years, which corresponds to the AER's current approach.. Ausgrid commissioned First Economics,[365] which has undertaken a comparison of actual inflation and the RBA's inflation target band since 2009. First Economics stated that the results suggest the AER should undertake a piece of work to compare alternative forecasting approaches. REU notes that this work was undertaken by Lally.[366]

Economic Policy, 25(64), 2010, pp. 755–806; Natasha Cassidy, Ewan Rankin, Mike Read and Claudia Seibold, 'Explaining Low Inflation Using Models', *Reserve Bank of Australia Bulletin*, June Quarter, 2019, pp. 143-166; Jon Chesire, 'Liquidity in Fixed Income Markets', *Reserve Bank of Australia Bulletin*, June Quarter, 2016, pp. 49–58; Ian Christensen, Frederic Dion and Christopher Reid, 'Real Return Bonds, Inflation Expectations, and the Break-Even Inflation Rate', *Bank of Canada Working Paper 2004–43*, November 2004, pp. 1–40; Jens Christensen and James Gillan, 'Could the US Treasury Benefit from Issuing More TIPS?', *Federal Reserve Bank of San Francisco, Working Paper Series*, 2012, pp. 1–37.

362 Deloitte Access Economics, *Review of the regulatory treatment of inflation*, 30 June 2020. For a survey of premia, biases and distortions in market-based measures see also AER (2017), *Regulatory treatment of inflation: Final position*, December; Hayden Mathysen, *Best Estimates of Expected Inflation: comparative assessment of four methods*, ACCC/AER Working Paper Series, No. 11, 2017.

363 Noting that robust decomposition estimates may be more meaningful even if the expected inflation component proved less historically accurate. This is because the NER requires best estimates of expected inflation and not best forecasts of inflation.

364 Ausgrid, *Submission to discussion paper, inflation review 2020*, July 2020.

365 First Economics (2020), *The AER's Inflation Review A report prepared for Ausgrid*, June.

366 Dr Martin Lally (Capital Financial Consultants Ltd), *Review of the AER's inflation forecasting methodology*, 8 July 2020.

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	First Economics provided an analysis of the UK BBIR which more broadly coheres with the findings in the literature, Deloitte[367] and Lally[368] and coheres REU's concerns regarding this market-based measure. First Economics warned against going back to the BBIR as an estimate of expected inflation. This is on the basis of First Economics findings in the UK market that: 1. Part of the BBIR may be explained by the inflation risk premium. The inflation risk premium is unobservable and can exert upward and downward pressures on the BBIR at different points in time. 2. There are distortions in the supply and demand for indexed bonds which render the BBIR 'meaningless'. One distortion relates to strong institutional demand for indexed bonds, which the ENA cited as a source of bias in the BBIR in 2007.[369] 3. Commentators have found it difficult to offer any explanation for the shape of the BBIR forward curves, the level of the BBIR at any given point along the curves and the shifts that there have been in the curves from month-to-month. 4. In light of the issues above, as of July 2020 Ofgem proposes to switch from the BBIR to an independent forecast of inflation produced by the UK's Office of Budget Responsibility.
AusNet Services	AusNet Services[370] submitted that since the point in time when the AER had rejected the use of the BBIR as a best estimate of expected inflation, the liquidity of bond markets have improved. However, it was established with evidence and studies by Deloitte[371] and during the 2017 AER inflation review that no such improvement has occurred, noting also that the BBIR is affected by relative liquidity of nominal and indexed CGS and not their absolute liquidity. In the absence of AusNet Services providing evidence of improved relative liquidity, REU remains unconvinced of AusNet Services' statement. REU also notes there are studies which find other premia, biases and distortions affecting the BBIR. AusNet Services submitted that the biases in market-based estimates of expected inflation are now small, irrelevant or can be adjusted. However, AusNet Services did not provide evidence that this is the case or proposed decomposition estimates of the BBIR or zero coupon inflation swaps where such biases can be identified and robustly removed for the purpose of obtaining expected inflation estimates from these market-based measures. We refer to Deloitte's report.[372]

ENA	Energy Networks Australia (ENA)[373] has several elements:
	• AER's current estimates of expected inflation have diverged from market expectations and actual inflation.
	• There is overwhelming evidence that expected inflation will not correspond to 2.5 per cent by financial year 2023.
	• Material weight should be given to market data for expected inflation rates because the role of the inflation parameter in the AER's regulatory framework is to convert a fixed nominal return into a fixed real return.
	• At least some weight should be given to estimates from financial markets because:
	  ○ It is perfectly consistent with the role the inflation parameter plays in the AER's framework
	  ○ It is based on observed market prices where real money is at stake

367 Deloitte Access Economics, *Review of the regulatory treatment of inflation*, 30 June 2020.

368 Dr Martin Lally (Capital Financial Consultants Ltd), *Review of the AER's inflation forecasting methodology*, 8 July 2020.

369 NERA Economic Consulting, *Bias in the indexed CGS yields as a proxy for the CAPM risk free rate*, *A report for the ENA,* March 2007, pp. 5-50.

370 AusNet Services, *Submission to discussion paper, inflation review 2020*, July 2020.

371 Deloitte Access Economics, *Review of the regulatory treatment of inflation*, 30 June 2020.

372 Deloitte Access Economics, *Review of the regulatory treatment of inflation*, 30 June 2020

373 Energy Networks Australia, *Submission to discussion paper, inflation review 2020*, July 2020.

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	○ Is used by other regulators. ENA submitted that AER's current estimates have diverged from market estimates of inflation and actual inflation. However, the findings of Deloitte where inflation expectations are found to largely converge to the midpoint of the RBA inflation target band by year 3.[374] Lally finds that across a range of approaches considered, the RBA's target is far superior to the use of market prices for forecasting inflation over a 5-10 year period. [375] REU also refers to the final paragraph in our response to the CRG's submission above. ENA also contended that the midpoint of the RBA inflation target band is not an estimate at all. However, REU considers that, given the study conducted by Deloitte,[376] which finds no evidence of a de-anchoring of long-term inflation expectations from the RBA target band, and given the findings of Lally[377] noted above, the midpoint is a reasonable estimate of longer term inflation expectations. The ENA presented evidence from the RBA survey of union and market economists longer term inflation expectations and inflation expectations of Consensus Economics. REU considers that business and union forecasts of inflation may need to be treated with some caution (as discussed during the AER inflation review in 2017).[378] However, the survey of market economists and Consensus Economics may be considered more plausible. While long-term Consensus Economics' forecasts are near the midpoint of the inflation target band, long-term market economists' inflation expectations are near the lower bound of the RBA's target band. The ENA submitted that market measures such as swaps and the BBIR are better estimates of expected inflation because real money is at stake in these markets. REU notes that the fact that real money is at stake in markets for inflation is the reason why implied inflation estimates from these markets are affected by liquidity premia, inflation risk premia, indexation lag, convexity bias, supply/demand changes, hedging costs, counterparty default risk, the bias of personal price indices and substitution effects, cash flow mismatch effects, and sensitivity of the BBIR to short-term inflation expectations among other premia, biases and distortions.[379] For example, there are unavoidable lags between the actual movements in the CPI and adjustments of indexed bond cash flows. Indexation lag may result in the forward yields on indexed CGS being calculated on the basis of both historical inflation rates and expected future short-term inflation rates. The effect of indexation lag on indexed CGS yields may be significant during periods of significantly above and below-trend inflation.[380] The effect of indexation lag on yields ensures that investors are compensated for these lags. However, because past inflation may influence the yields on indexed CGS, the BBIR does not necessarily represent a best estimate of *expected* inflation. ENA submitted that the AER's approach produces results that are inconsistent with market evidence. The substance of ENA's submission is that the AER-calculated real risk free rate is below that observed on indexed yields on CGS. REU is concerned that the substance of ENA's argument depends on this observed difference when it was established with evidence in

374 Deloitte Access Economics *Review of the regulatory treatment of inflation*, 30 June 2020.

375 Dr Martin Lally (Capital Financial Consultants Ltd), *Review of the AER's inflation forecasting methodology*, 8 July 2020.

376 Deloitte Access Economics, *Review of the regulatory treatment of inflation*, 30 June 2020.

377 Dr Martin Lally (Capital Financial Consultants Ltd), *Review of the AER's inflation forecasting methodology*, 8 July 2020.

378 See: Hayden Mathysen, *Best Estimates of Expected Inflation: comparative assessment of four methods*, ACCC/AER Working Paper Series, No. 11, 2017.

379 Deloitte Access Economics, *Review of the regulatory treatment of inflation*, 30 June 2020. For a survey of premia, biases and distortions in market-based measures see also Hayden Mathysen, *Best Estimates of Expected Inflation: comparative assessment of four methods*, ACCC/AER Working Paper Series, No. 11, 2017.

380 Stefania D'Amico, Don Kim and Min Wei, 'Tips from TIPS: The informational content of Treasury Inflation-Protected Security prices', Finance and Economics Discussion Series, Divisions of Research and Statistics and Monetary Affairs, Federal Reserve Board, 2014-24, 2016, p. 15.

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	2017,[381] and repeated by Deloitte[382] and Lally[383] and, further confirmed by QTC[384] with respect to liquidity and inflation risk premia that observed indexed and nominal yields on CGS are subject to various premia, biases and distortions. ENA asked the question whether market estimates are appropriate because they reflect something other than the pure expectation of inflation. REU acknowledges the question raised. The ENA then argued that the role of the inflation parameter within the AER's framework is identical to zero coupon inflation swaps and BBIR since what is required is an estimate of the price of converting a nominal return into a real one. REU has three remarks. First, the inflation estimates for zero coupon inflation swaps are likely to be different to the break-even estimates given that the differences in the magnitude and type of premia, biases and distortions. So converting the nominal return into a 'real' return will give different real estimates depending the market measure used. Therefore, we consider that the ENA's proposition that the inflation parameter within the AER's framework is identical does not hold. Second, the BBIR and inflation swaps are unlikely to be best estimates of expected inflation under the NER/NGR. No stakeholder has provided convincing evidence or has undertaken best practice decomposition studies that either removes the premia, biases and distortions from the market-based measures or demonstrated these premia, biases and distortions are negligible. Therefore, the BBIR or zero coupon inflation swaps are not compatible with the AER's framework as per the NER/NGR. Third, implied in ENA's submission is the proposition that the inflation risk premium should be included in the AER's inflation estimate to achieve a targeted real return. Such an argument is inconsistent with the second point above. Moreover, ENA has not considered all the other premia, biases and distortions in market-based measures with the effect that the market-based measures are unlikely to be best estimates of expected inflation. As shown by Lally[385] and as stated by Armitage, the inflation risk premium, if it exists and assuming it could be accurately and robustly estimated, is a component of the expected *real* rate of return on an asset – and therefore also a component of the asset's expected nominal rate. As Armitage states: 'An inflation risk premium is not part of the difference between the nominal rate and the real rate.'[386] Armitage's point is consistent with the NER/NGR that the difference should represent best estimates of expected inflation. The corollary is that adjusting the nominal risk free rate by best estimates of expected inflation gives a correct expected real return, where the latter may or may not include an inflation risk premium. While establishing the existence or estimating the size of this premium may be the subject of some contention, the first principles expounded by Armitage are nevertheless correct. ENA submitted that zero coupon inflation swaps are more likely to be upwardly biased than downwardly biased and therefore AER's current estimates of expected inflation – which are above the inflation swap rate – is cause for concern. However, ENA has not presented any decomposition studies of zero coupon inflation swaps to support its position that the net effect of any premia, biases and distortions are positive, noting that while inflation risk premia may be positive as the AER reported, the premia can also become negative.

381 AER, *Regulatory treatment of inflation: Final position*, December 2017.

382 Deloitte Access Economics, *Review of the regulatory treatment of inflation*, 30 June 2020.

383 Dr Martin Lally (Capital Financial Consultants Ltd), *Review of the AER's inflation forecasting methodology*, 8 July 2020.

384 Queensland Treasury Corporation, *Review of the regulatory treatment of inflation*, Submission to the AER Discussion Paper, 29 July 2020.

385 Dr Martin Lally (Capital Financial Consultants Ltd), *Review of the AER's inflation forecasting methodology*, 8 July 2020.

386 Seth Armitage, *The Cost of Capital: Intermediate Theory*, Cambridge, 2005, p. 226.

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	REU is also concerned about whether zero coupon inflation swap prices may be distorted given Moore's[387] and Deloitte's[388] findings of low market activity, low scale, low liquidity, and/or considerations that the market is dominated by few large market makers. Further, the zero coupon inflation swap prices may reflect a mix of traded and dealer quotes and are therefore do not necessarily represent mark-to-market prices. ENA also submitted that the BBIR has merit because it is based on the observed market prices of traded securities and has the added advantage of being based on the same government bond yields used elsewhere by the AER. The ENA also supported the QTC's approach to adjusting for any premia in the BBIR. REU notes that ENA's belief that the BBIR is based on observed market prices may be misplaced. The current and historical calculations of the BBIR may require the interpolated estimates of yields obtained from yield curve models to match 10 year yields to maturity on indexed and nominal CGS. The consequence of using yield curve models to match the yields to maturity on nominal and indexed CGS is that the BBIR over different horizons may not reflect mark-to-market expectations of inflation for those horizons. This is because the BBIR is calculated from estimates of yields rather than market-observed yields. The BBIR will therefore likely be sensitive to the yield curve model chosen. Moreover, the few tenors of indexed CGS may mean a number of curves may be fitted to observed yields with the consequence that BBIR estimates of expected inflation will be different. And these issues arise even before consideration of the various premia, biases and distortions that affect the BBIR. ENA submitted that there is evidence that inflation will not return to 2.5 per cent by year 3 and market-based measures (such as the BBIR) produce an estimate of inflation that is entirely appropriate. Specifically: • ENA submitted that the 10 year BBIR is at a historically low level and concluded that the AER's current approach is unsatisfactory. Lally notes that the deficiencies in the BBIR as a predictor of inflation have been demonstrated earlier and Lally shows that using a long time series the BBIR performs relatively poorly and that the AER's current approach performs best. The AER's current approach is also supported by Consensus Economics forecasts of inflation when using a long time series. • ENA listed a series of short-term forecasts reported by the RBA and submitted that all are at or near the lowest levels ever and therefore the AER's current approach is unwarranted. However, Lally notes that the AER uses the RBA's forecasts for the next two years, so the ENA are not citing any information that the AER is not already using. • ENA noted that the annual inflation rate has been under 2.5 per cent for the last 20 quarters and reversion back to 2.5 per cent will not occur within two years. Therefore, the AER's current methodology is deficient. Consensus Economics data and RBA commentary suggests that it is expected to take inflation longer to return to the target band. The issue is whether the AER should change its methodology and adopt a glide-path back to 2.5 per cent and under what conditions the AER should do so if it does not do so always. Both are subjective. The AER's current approach avoids this subjectivity and the NPV=0 will be satisfied as long as these situations in which reversion to the target is unusually slow are symmetric. Lally does not hold a view on whether such symmetry exists. ENA refer to CEG,[389] which provides the same or similar arguments to that of the ENA above. CEG focused on the inflation risk premia, but did not address all the other documented premia, biases and distortions in market-based measures. We do not accept CEG's statement that the inflation risk premium only applies to nominal assets (noting that the inflation risk premium applies to the real return within nominal assets) and not to real assets. REU points to the following:

[387] Angus Moore, *Measures of Inflation Expectations in Australia, Reserve Bank of Australia Bulletin*, December Quarter, 2016, pp. 23–31.

[388] Deloitte Access Economics, *Review of the regulatory treatment of inflation, 30 June 2020.*

[389] CEG, *Delivering meaningful real returns via the PTRM, RORI and RFM*, July 2020.

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	• As a result of indexation lag, the real return on indexed bonds may be exposed to some inflation risk.[390] There is research which finds that inflation risk premia may be embedded in indexed bond yields to compensate investors for such risk. This is known as *indexation lag risk premia*. • Tax regimes in existence tend to cause post-tax real returns to remain uncertain even if pre-tax real yields are known. Since tax is levied on the nominal yield, not the real yield, the tax system reintroduces inflation risk for indexed bonds. Post-tax real yields may become uncertain and variable if inflation is uncertain.[391] If the demand for bonds is a function of their expected post-tax returns, pre-tax indexed bond yields may include inflation risk premia to compensate investors for the potential uncertainty of post-tax real returns. The existence of inflation risk premia in indexed bond yields may result in BBIR estimates departing from market expectations of inflation. • Real assets may often be indexed to the CPI. However, the personal price index of investors may be different to the CPI and therefore indexed bonds are only a partial hedge for inflation risk. Consequently, investors may demand a risk premium for the remaining exposure to an imperfect inflation hedge.[392] REU is unconvinced of CEG's submission that the inflation risk premia only applies to nominal assets.
Endeavour Energy	Endeavour Energy[393] endorsed the ENA's submission that market measures of inflation – zero coupon inflation swaps and an adjusted BBIR – will produce better and simpler estimates than the glide-path approach. REU notes Endeavour Energy's preference. However, Endeavour Energy has not presented evidence or studies to support its position. REU notes the studies by Deloitte[394] and Lally[395] and literature on the BBIR and zero coupon inflation swaps by central bankers, academics and market practitioners which find significant premia, biases and distortions in these market measures.
Energy Queensland	Energy Queensland (EQ)[396] submitted that Australia has been in a protracted low inflation environment for close to a decade. EQ also submitted that as a result of the global low inflation, the current pandemic and interest rate settings near zero, the low inflation experience could persist for a long time. REU notes that EQ has provided no evidence that long-term inflation expectations are no longer anchored to the RBA's target band.
SA Power Networks	SA Power Networks (SAPN)[397] submitted that the AER's current approach materially overstates expected inflation in the prevailing market conditions. However, REU considers that SAPN has provided no information, evidence and/or studies to support this statement.

390 Deacon et al. state that: 'there is at the end of a bond's life when there is no inflation protection at all, counterbalanced by a period of equal length before it is issued for which inflation compensation is paid. In general the inflation rate in these two periods will not be the same, and consequently the real return on an indexed bond will not be fully invariant to inflation – the longer the lag, the poorer the instrument's inflation proofing'. Mark Deacon, Andrew Derry and Dariush Mirfendereski, *Inflation-indexed Securities – Bonds, Swaps and Other Derivatives*, Second Edition, John Wiley & Sons, West Sussex, 2004, p. 26.

391 Mark Deacon, Andrew Derry and Dariush Mirfendereski, *Inflation-indexed Securities – Bonds, Swaps and Other Derivatives*, Second Edition, John Wiley & Sons, West Sussex, 2004, p. 7; pp. 31-34; Wesley Phoa and Michael Shearer, *Advanced Fixed Income Analytics*, Frank J. Fabozzi and Associates, New Hope, 1998, pp. 95-96.

392 Jens Christensen and James Gillan, 'Could the US Treasury Benefit from Issuing More TIPS?', *Federal Reserve Bank of San Francisco, Working Paper Series*, 2012, p. 24.

393 Endeavour Energy, *Submission to discussion paper, inflation review 2020*, July 2020.

394 Deloitte Access Economics, *Review of the regulatory treatment of inflation, 30 June 2020.*

395 Dr Martin Lally (Capital Financial Consultants Ltd), *Review of the AER's inflation forecasting methodology*, 8 July 2020.

396 Energy Queensland, *Submission to discussion paper, inflation review 2020*, July 2020.

397 SA Power Networks, *Submission to discussion paper, inflation review 2020*, July 2020.

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	Lally's reviewed SAPN's earlier submission in 2019.[398] We summarise key points below: • SAPN submitted that since the AER's last review inflation expectations have declined to the extent that long-term expectations have de-anchored from the RBA's target band and therefore that the AER's current reliance upon the RBA's inflation target of 2.5 per cent is no longer justified. SAPN made reference to the 10 year BBIR and 5 and 10 year zero coupon inflation swaps to support its claim. However, Lally notes that these estimators are likely biased to an extent that fluctuates through time and empirical evidence indicates that they are inferior to use of the RBA's target. Lally further notes that since SAPN focused upon their current values, it is instructive to examine the predictive success of earlier extreme values for these prices. The errors in the 10 year BBIR are large and consistent with overreacting to short-term changes in inflation and/or the presence of significant time variation in the risk and illiquidity premiums. The BBIR has a very poor forecasting record when forecasting extreme values, and the credibility of its current low value as a forecast for the next 10 years is minimal. • SAPN also noted that the RBA's forecasts have been too high for the past several years and therefore should no longer be relied upon. However, Lally explains that the issue is not whether the RBA's forecasts are 'good' or 'bad', but which forecasting methodology is best. Lally compared the possible forecasting methods using a long time series of inflation and concluded that the AER's current approach is best. Use of such long-term data assumes that inflation rates are still mean reverting to approximately 2.5 per cent and the evidence from Consensus Economics continues to support this scenario.
TransGrid	TransGrid[399] submitted that current market estimates of expected inflation are around 1.3 per annum in contrast to the AER's estimate of 2.3 per cent per annum. However, TransGrid did not submit any information, evidence or studies to support its claim that the current market estimates of expected inflation are below the AER's estimate.
Other	
Aurizon	Aurizon[400] proposed that the AER adopt the BBIR. Aurizon undertook a comparison of forecast accuracy of different measures of expected inflation over a four year horizon and found that the BBIR is the most historically accurate. However, Aurizon concentrated on a relatively narrow sample period of December 2009 to December 2018 – it is unclear why Aurizon picked this narrow sample period. Lally adopts a sample period that commences near the start of inflation targeting in 1994 to 2019. Lally finds that the BBIR performs relatively poorly in terms of forecast accuracy.[401] Aurizon proposed some weighted market approach of the BBIR and zero coupon inflation swaps. The critical assumption is an inverse correlation between the premia, biases and distortions of these market measures. Aurizon presented no evidence of an inverse correlation between the various premia, biases and distortions for cash and inflation derivative markets. There may be some evidence of potential inverse correlation between the biases in the US markets (found in a paper cited by QTC),[402] based on model derived estimates of survey expectations of inflation (inflation distribution parameters). However, if inflation risk premia exist and are significant in both cash and derivatives markets, it is difficult to understand why these inflation risk premia would be inversely correlated. An inverse correlation does not necessarily mean the weighted market approach estimator is absent premia, biases and distortions – it may just indicate that their magnitude may be lower (and it is doubtful whether an inverse correlation would hold across all premia, biases and

398 SA Power Networks, *Regulatory Treatment of Inflation-Request for Review*, 20 September 2019.

399 TransGrid, *Submission to discussion paper, inflation review 2020*, August 2020.

400 Aurizon, *Submission to discussion paper, inflation review 2020*, July 2020.

401 Dr Martin Lally (Capital Financial Consultants Ltd), *Review of the AER's inflation forecasting methodology*, 8 July 2020.

402 Thuy-Duong To and Ngoc-Khanh Tran, 'Cheap TIPS or Expensive Inflation Swaps? Mispricing in Real Asset Markets', 2019.

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	distortions). And therefore this approach is unlikely to satisfy the NER as producing a best estimate of expected inflation. Aurizon's statement on the desirability of an alignment between central bank inflation targets so that inflation expectations are consistent with stable real exchange rates is not relevant to the issues considered. In any case, Aurizon does not appear to have considered that in long run equilibrium under the law of one price, relative price differences are captured in the nominal exchange rate such that the real exchange rate is stable (one).[403] But even if Aurizon's horizon is shorter than the long run, the two most important influences on the Australian real exchange rate are real interest rate differentials and the terms of trade.[404]
CitiGroup	CitiGroup[405] expressed concern that since 2015 a significant majority of actual inflation observations have been below the inflation target band. We acknowledge that there are deviations from the target band, but we do not consider that CitiGroup has demonstrated how these actual deviations inform both short-term and long-term inflation expectations. Lally finds that across a range of approaches considered, the RBA's target is far superior to the use of market prices for forecasting inflation over a 5-10 year period. We also refer to the final paragraph in our response to the CRG's submission above.
Network Shareholder Group	The Network Shareholders Group (NSG)[406] submitted that the AER's forecast of inflation has diverged from market expectations and actual inflation. The NSG attributed this divergence to the AER's adoption of the midpoint of RBA's inflation target range where NSG submitted that this is no longer a proxy for long-term inflation expectations. The NSG has not provided any evidence and studies to support these statements. It is also unclear to the AER what NSG is referring to in relation market expectations of inflation. Deloitte finds that: • The AER's current approach is highly robust, transparent, replicable and simple and is sufficiently congruent with current 10 year market expectations of inflation. • The implied inflation estimates from market-based measures are affected by material and time-varying distortions that limit their use in a regulatory context. • That on the basis of the current data and literature the AER's approach is still fit for purpose give the lack of clear evidence of the de-anchoring of inflation expectations from the inflation target range. Lally finds that across a range of approaches considered, the RBA's target is far superior to the use of market prices for forecasting inflation over a 5-10 year period.
QTC	The Queensland Treasury Corporation (QTC)[407] proposed that a market-based measure of inflation compensation such as the BBIR is used as an estimate of inflation and that liquidity premia in the implied real yields as a result of using the BBIR can be removed, also using market measures. REU observes that the QTC has demonstrated an understanding of market-based inflation expectations and their relevant premia. QTC submitted that by using a market-based measure of expected inflation, the same amount of inflation compensation is included in the nominal allowed return as is included in the revenue deduction. This way, the net effect of an inflation risk premium is zero. However, the NER/NGR requires that the AER to determine a method that is likely to result in best estimates of expected

403 This traditional PPP analysis assumes the real exchange rate is mean reverting and stationary, which is consistent with Aurizon's statements on mean reversion and stationarity of inflation. Ronald MacDonald, *Exchange Rate Economics Theory and Evidence*, Routledge, 2007, pp. 39-47.

404 See Blair Chapman, Jarkko Jaaskela and Emma Smith, A Forward-looking Model of the Australian Dollar, *RBA Bulletin*, December 2018.

405 Citigroup Australia, *Submission to discussion paper, inflation review 2020*, July 2020.

406 Network Shareholders Group, *Submission to discussion paper, inflation review 2020*, July 2020.

407 Queensland Treasury Corporation, *Submission to discussion paper, inflation review 2020*, July 2020.

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	inflation or a best forecast/estimate possible in the circumstances.[408] These estimates exclude any biases, premia or distortions or at the very least they are relatively negligible compared to other methods. REU also concurs with Lally's response to QTC's 2019 proposal to use the BBIR, that the BBIR is a very poor estimator of expected inflation.[409] Therefore, the BBIR is unlikely to satisfy the requirements of the NER/NGR. QTC proposed that the spread between the zero coupon inflation swap and the BBIR can provide a correction for the liquidity premia on indexed CGS. Such a correction can be employed to adjust the implied real yields when using the BBIR as an estimate of inflation in the PTRM. However, REU considers that QTC has not provided evidence that all the other biases, premia and distortions that are observed/estimated in these markets aside from the liquidity premia are negligible. Even if these other premia, biases and distortions are negligible, the potential time variation of liquidity premia presents problems for its estimation. Note also that the BBIR is often calculated from the *estimates* of yields on nominal and indexed bonds. If there are few tenors of nominal or indexed bonds and/or if maturities do not approximately match, yield curve models may be fitted to the observed yields to maturity. Given the few tenors of indexed CGS, many different yield curves may be fitted obtain the estimates of yields on indexed CGS with the consequence of many different BBIR implied estimates of expected inflation. Therefore, the estimated spread between the zero coupon inflation swap and the BBIR may be highly variable and may not only capture other phenomena but capture, for example, how the variations in how the BBIR is subjectively estimated in the first place. REU also notes that zero coupon inflation swaps may also be subject to a number of premia, biases and distortions. The Australian zero coupon inflation swap market may have a large number of distortions arising from hedging costs, indexation lag, inflation risk premia and potential distortions from thin trading (noting also that observed zero coupon swap prices do not necessarily represent mark-to-market prices).[410] QTC also considered a model free approach to the estimation of liquidity premia for the purpose of correcting AER implied real yield when using the BBIR. However, REU notes that model free estimates of liquidity premia are hampered by the relative paucity of Australian data on proxies for liquidity in which to estimate liquidity premia, noting that the US cash and derivative markets are relatively data rich in that regard. In any case, in many of the studies surveyed, liquidity premia estimates were highly sensitive to both the study conducted and sample period chosen.[411] QTC observed that the average difference between the BBIR and the AER's estimates for the 12 months to December 2019 cannot be explained by the difference between the inflation risk premia and the liquidity (risk) premia because such differences would only be consistent with liquidity/flight to quality episodes. However, the difference is not necessarily collapsible to these premia alone. It will also be observed that the liquidity premia can be large but need not be of the magnitude of liquidity/flight to quality episodes if the inflation risk premia is also negative. In other words, a negative inflation risk premia and liquidity premia may explain the difference, in addition to other premia, biases and distortions. The supply and demand changes in the cash

[408] NER, cll. 6.4.2(b)(1) and NGR, r. 74(2)(a) and 74(2)(b).

[409] Dr Martin Lally (Capital Financial Consultants Ltd), *Review of the AER's inflation forecasting methodology*, 8 July 2020.

[410] For a survey of evidence of biases, premia and distortions in the BBIR and zero coupon inflation swaps see: Deloitte Access Economics, *Review of the regulatory treatment of inflation, 30 June 2020*, Hayden Mathysen, *Best Estimates of Expected Inflation: comparative assessment of four methods*, ACCC/AER Working Paper Series, No. 11, 2017.

[411] For a survey of evidence of biases, premia and distortions in the BBIR and zero coupon inflation swaps see: Deloitte Access Economics, *Review of the regulatory treatment of inflation, 30 June 2020*, Hayden Mathysen, *Best Estimates of Expected Inflation: comparative assessment of four methods*, ACCC/AER Working Paper Series, No. 11, 2017.

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	market and capital availability can influence the BBIR, such phenomena are not necessarily informed by changes in market expectations of inflation.[412] For example, in 2007 the ENA expressed concern about the bias in the BBIR – this was attributed to a supply and (strong institutional) demand issue.[413] Ausgrid's consultant, First Economics,[414] warns against readoption of the BBIR on the basis of similar findings in the UK market. First Economics finds that distortions in the supply and demand render the UK BBIR 'meaningless'. This last point highlights the following consideration: even if inflation risk and liquidity premia are robustly estimated, QTC should demonstrate with evidence that the other premia, biases and distortions are sufficiently negligible such that inferences of bias are veritably collapsible to inflation risk and liquidity premia.[415]
Spark Infrastructure	Spark Infrastructure[416] made a number of submissions on expected inflation, including: 1. The AER's current approach is materially above market expectations 2. The AER's current approach is materially above RBA expectations 3. The AER's current approach is materially above the calculation for the 5 year period 4. The RBA is likely to be perceived as less effective in influencing the economy and inflation rate 5. The expected forecast errors of maintaining the current approach will be large and asymmetrical. REU notes that Spark Infrastructure's submissions are not substantiated by any evidence or studies. In proposing the use of market-based measures, Spark Infrastructure refers to CEG's analysis of an assessment of forecast accuracy of the AER current estimates but at a 5 year horizon, and the 5 year BBIR and 5 year implied inflation from zero coupon inflation swaps. CEG selected March 2007 as the starting point of the sample period since that is when RBA first began releasing its forecasts. CEG selected a 5 year horizon of AER current estimates, the BBIR and zero coupon inflation swaps and one reason for doing so is because more actual inflation data are available. Another reason is its position on the desirability of a 5 year horizon of inflation for the trailing average cost of debt. REU has concerns with the CEG's analysis: 1. It is unclear what CEG's study of historical forecast is designed to achieve because it a test of competing hypotheticals: hypothesised 5 year AER estimates of expected inflation; the 5 year BBIR and 5 year implied inflation from zero coupon inflation swaps. One of the motivations for the AER's 2020 review of inflation is to determine whether AER's 10 year current estimates of expected inflation continue to be best estimates of expected inflation. CEG's study does not address this question. 2. Since support for the AER's 10 year current estimates are based on an anchoring of inflation expectations within the target band, a better choice for the start of the sample period is when the RBA commenced inflation targeting: in 1993. Extending the sample period to 1993 or 1994 may allow CEG to undertake a comparative assessment of methods at the 10 year horizon.

412 For a survey of evidence of biases, premia and distortions in the BBIR and zero coupon inflation swaps see: Deloitte Access Economics, *Review of the regulatory treatment of inflation, 30 June 2020*, Hayden Mathysen, *Best Estimates of Expected Inflation: comparative assessment of four methods*, ACCC/AER Working Paper Series, No. 11, 2017.

413 The RBA noted that the demand for these bonds has increased as supply has fallen and that turnover in the bonds is low and the market is fairly illiquid. RBA, Letter to Joe Dimasi, ACCC, *Comments on a report prepared by NERA concerning the Commonwealth Government bond market*, Financial Markets Group, 9 August 2007, p. 3.

414 First Economics, *The AER's Inflation Review A report prepared for Ausgrid*, June 2020.

415 For a survey of evidence of biases, premia and distortions in the BBIR and zero coupon inflation swaps see: Deloitte Access Economics, *Review of the regulatory treatment of inflation, 30 June 2020*, Hayden Mathysen, *Best Estimates of Expected Inflation: comparative assessment of four methods*, ACCC/AER Working Paper Series, No. 11, 2017.

416 Spark Infrastructure, *Submission to discussion paper, inflation review 2020*, July 2020.

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	CEG's analysis of historical forecast accuracy of the different measures provides the opportunity for REU to make a broader point on historical tests of forecast accuracy. The AER's current estimates of expected inflation are based on an anchoring of long-term inflation expectations within the RBA target band. And scrutiny of whether long-term inflation expectations have been (e.g. Lally's[417] assessment of forecast accuracy) and more importantly continue to be anchored (e.g. survey-based proxies for market inflation expectations, Phillips Curve studies, market derived estimates of expected inflation such as Finlay and Wende[418]) within the RBA target band is a necessary recourse for research inquiry. The use of RBA forecasts of inflation over a two year horizon as a proxy for the short-term inflation expectations component of the AER's current estimates are also assessed. The research inquiry into market measures requires equal rigour and scrutiny as that conducted for the AER's current estimates. Market expectations of inflation within the BBIR and zero coupon inflation swaps are unobserved variables. Therefore, when historical forecast accuracy of the BBIR or zero coupon inflation swaps are assessed, they are assessed on the basis their raw implied inflation rates and not necessarily assessed on the basis of unobserved market expectations of inflation. Any findings of historical forecast accuracy of BBIR or zero coupon inflation swaps could be partly attributed to changes in their premia, biases and distortions.[419] As a result, there is the possibility that the findings of accuracy are spurious particularly over short sample periods. Therefore, REU considers that even if the BBIR and zero coupon inflation swaps were found to be historically relatively accurate in predicting actual inflation, such findings are not sufficient for adopting these raw implied inflation estimates. The reason is that there is considerable evidence that the raw implied inflation estimates from the BBIR and zero coupon inflation swaps are unlikely to correspond to market inflation expectations. As raw estimates the BBIR and zero coupon inflation swaps are unlikely to satisfy the NER/NGR. The raw implied inflation rates would need to be robustly decomposed (robustness with respect to different method chosen and out-of-sample period testing) into the premia, biases and distortions and market expectations of inflation. This way, a comparative assessment of the historical forecast accuracy of different methods is more likely to be consistent with the NER/NGR since it is based on a comparative assessment of the historical performance of estimates of market expectations of inflation. A further stage would require an assessment of whether the decomposed estimates of market expectations of inflation from market-based measures are likely to correspond to best estimates of expected inflation over a future horizon that is consistent with the NER/NGR.

[417] Dr Martin Lally (Capital Financial Consultants Ltd), *Review of the AER's inflation forecasting methodology*, 8 July 2020.

[418] Richard Finlay and Sebastian Wende, 'Estimating Inflation Expectations with a Limited Number of Inflation-indexed Bonds', *Research Discussion Paper, Reserve Bank of Australia*, RDP 2011–01, March 2011, pp. 1–35

[419] For a survey of evidence of biases, premia and distortions in the BBIR and zero coupon inflation swaps see: Deloitte Access Economics, *Review of the regulatory treatment of inflation, 30 June 2020*, Hayden Mathysen, *Best Estimates of Expected Inflation: comparative assessment of four methods*, ACCC/AER Working Paper Series, No. 11, 2017.

E Response to criticisms of Deloitte Access Economics' report

The submissions received from the ENA and APGA included criticism of the findings included in the report provided by our independent expert, Deloitte. This report is summarised in section 6.2.1 and is available on our website.

This criticism was based on two primary issues: that the findings in the report were not appropriate; and that Deloitte made public comments in May 2020 which contradict the report's findings and would indicate that, in fact, Deloitte considered that our current approach materially overestimates expected inflation in the prevailing market conditions. We address these two criticisms below.

E.1 Deloitte's findings were not appropriate

ENA

The ENA submitted detailed concerns in relation to the findings of the report provided by Deloitte. We have summarised these concerns[420] and our response to these concerns in Table E.1.

Table E.1 ENA concerns on the findings in Deloitte's report

ENA's concerns	AER Response
Studies are out of date	The Deloitte report acknowledged this limitation – there are few studies that examine inflation expectations in 2019 and 2020. The Deloitte report however did use a few recent studies; Moessner and Takats (2020) and Yetman (2020). Deloitte also considered the most recent Consensus Economics and RBA data in forming its conclusion.
No consideration of whose expectations should be estimated	This consideration was not included in Deloitte's term of reference
No recognition that the AER approach is not an expectation at all	Deloitte was required to assess what method is likely to result in the best estimate of expected inflation. This was not included in Deloitte's term of reference.
Flawed analysis of 'de-anchoring'	Deloitte's report found bias in the use of market-based measures to consider any 'de-anchoring.' In making its assessment in relation to anchoring, Deloitte considered Consensus Economics long-term inflation expectation data. Deloitte also acknowledged that most recent studies focus on countries other than Australia and tend to analyse data over several years (which may cloud potential insights into recent changes in inflation expectations).

[420] ENA, *Submission to discussion paper, inflation review 2020*, July 2020, pp. 59-68.

ENA's concerns	AER Response
Use of circular ranking criteria	The consideration of the assessment criteria was not included in Deloitte's terms of reference. The assessment criteria was developed to provide a framework to assess which method is likely to result in the best estimate of expected inflation in line with the NER and NGR. These criteria were used in the 2017 Inflation Review, where we addressed all relevant concerns. No new concerns have been raised in response to the Discussion Paper.
Mis-ranking based on exclusion of inflation risk premium	Deloitte's report assessed the use of inflation swaps as a method for determining the "best estimate" of expected inflation. As provided in the report, Deloitte noted a number of disadvantages to inflation swaps being used as a method, and its recommendation was provided on this basis.
Double counting of perceived weaknesses of market evidence	Deloitte's report determined that biases in break-even may affect the resulting estimate of expectation, and that a complex method is required to remove those biases.
No basis for some rankings – 'fair' ranking in terms of simplicity for swaps	Deloitte's report noted that biases in swaps even may affect the resulting estimate of expectation.
Deloitte findings excludes relevant evidence	Deloitte's report made assessments according to its expertise and relevant information.

APGA

APGA's submission also raised issues with Deloitte's report. These issues were focused on the recommendations of Deloitte and the evidence it used to reach its findings. APGA's submission stated that the Deloitte report should be given no weight, and provided an alternative opinion to those opined by Deloitte in its report.[421]

We note these comments from APGA and their opinion in relation to recommendations of Deloitte, however these recommendations were made by Deloitte according to its relevant expertise and are relevant for this inflation review.

E.2 Deloitte's findings inconsistent with public comments

The ENA's submission[422] also raised comments by Deloitte in the media, where Deloitte stated that the current pandemic:[423]

> Drops us into low inflation for the next decade.

[421] APGA, *Submission to discussion paper, inflation review 2020*, July 2020, p. 13

[422] ENA, *Submission to discussion paper, inflation review 2020*, July 2020 pp. 61-62.

[423] ABC News, *Coronavirus tipped to leave $360b budget black hole that tax reform can help fill*, 11 May 2020.

And in their Business Outlook in July 2020:[424][425]

> Australia and the world are 'printing money' hand over fist. But the very last thing you need to worry about is any lift in inflation. Demand is dead as a doornail, and wage gains – already weak – are set to fade further. Globally and locally, interest rates will be nailed to the floor for years. That's because (1) this is a big recession, (2) inflation is as dead as a door nail…

The ENA's submission noted that it is difficult to reconcile Deloitte's conclusion in support of the AER's approach, with their recent comments in the media and their Business Outlook forecasts.

In considering these public comments, we conclude that they are not relevant to either the terms of reference to which Deloitte provided its expert advice, or what method is likely to result in the best estimates of expected inflation. We also note that the comments made in the Business Outlook were made in relation to the impact of quantitative easing of forecast inflation.

Deloitte's public comments were not in relation to what is the best estimate of expected inflation

Under the rules[426] we are required to determine a method that is likely to result in the best estimates of expected inflation. We therefore requested that Deloitte provide an:

> …expert opinion (and reasons) regarding the extent to which our existing estimation method and any other method canvassed in the submissions are likely to result in the best estimate of expected inflation...

We did not request Deloitte to provide a forecast for expected inflation. Further, Deloitte's comments in the article published by the ABC on 11 May 2020 were made in the context of property investments and a call for the Federal Government to revisit negative gearing and the level of capital gains tax concessions available. Deloitte's spokesperson opined that COVID-19 would 'drop us into low inflation for the next decade'. However, we do not consider that it is possible to infer from this statement that inflation will de-anchor from the RBA's target band. We consider caution should be exercised when utilising comments targeted for the media. By contrast, Deloitte's report to us is a considered and thoughtful report in response to terms of reference targeted at our task.

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424 Deloitte Access Economics, *Business Outlook: Fast crisis, slow recovery*, July 2020.

425 The submission received from Spark Infrastructure also provided commentary on public comments made by Deloitte in May 2020 as evidence of de-anchoring of market expectations from the mid-point of the RBA's target band.

426 NER, cll. 6.4.2(b)(1) and 6A.5.3(b)(1); NGR, rr. 75B(2)(b) and 74.

Comments made in relation to the impact of quantitative easing on forecast inflation

In Deloitte's Business Outlook for July 2020, Deloitte provided extensive comments in relation to quantitative easing and its impact on forecast inflation. The comment that there is no need to 'worry about any lift in inflation,' was to answer any comments that the extensive quantitative easing by the central banks will lead to spiralling inflation in Australia.

This Business Outlook also discussed interest rates and Deloitte's opinion that 'interest rates will be nailed to the floor for years' despite the quantitative easing. Deloitte comments that 'inflation is as dead as a door nail', in our view, reiterated that quantitative easing will not lead to spiralling inflation and an increase in interest rates.

We also note that Deloitte's comments related to its own forecasts on the economic impacts of the current pandemic and the fiscal and monetary policies to address these impacts. These do not relate to the method that should be used to determine the best estimates of expected inflation.

E.3 Use of Deloitte Access Economics Report

Based on our response to the criticisms provided above, we do not agree with the criticism provided by stakeholders on the appropriateness of the Deloitte Report. We consider this criticism takes the Deloitte Report out of context.

Deloitte was requested to provide expert advice in accordance with the terms of reference included in its report. This terms of reference was developed according to our requirements under the NER and NRG in relation to determining the best estimate of expected inflation. It is appropriate for us to develop terms of reference for experts to advise us on the issues before us. Stakeholders then have the opportunity to comment on the issues when we publish the reports.

Based on this assessment, we did not approach Deloitte to respond to the questions included in ENA's submission.[427] We intend to give Deloitte's report full weight for the purposes of this inflation review.

[427] ENA, *Submission to discussion paper, inflation review 2020*, July 2020, pp. 67-68.

F Response to submissions on delivery of the initial rate of return (issue 2)

This appendix includes a detailed response to stakeholder submissions on 'Issue 2' in the discussion paper.

Table F.1 Our response to submissions on issue 2

Comment in Submission	Our Response
Consumer Groups	
Consumer groups provided support for the current regulatory framework delivering the initial real rate of return, with the CRG and EUAA providing support for Sapere's report.[428] The ECA report provided support from the 2017 Inflation Review that service providers will not suffer economic loss from the real rate of return if the variation between expected and actual inflation is uniform.[429]	We agree with the consumer group submission, that the current regulatory framework delivers the initial real rate of return.
Service Provider and Industry Groups	
The ENA's submission noted that the current approach delivers the target ex-ante expected real rate of return. However, the ENA submitted that this is wrong in two respects:[430] • the benchmark efficient return on debt is a nominal return, in which case it is wrong to target a real allowance • In relation to the return on equity, the AER's targeted real return is manifestly too low because the AER has deducted an unreasonably high estimate of expected inflation.	As provided section 16.1, we consider that the current regulatory framework delivers the initial real rate of return. We engaged Sapere to provide advice in relation to whether the regulatory framework successfully delivers the current target. Its analysis concluded that our current approach delivers the intended rate of return regardless of whether actual inflation is above or below the forecast of inflation.[431] In responding directly to the ENA's two critiques respectively we note: • The targeting of a real rate of return on debt (and equity) is based on strong economic rationale, is consistent with past regulatory treatment and is consistent with our rate of return approach, which includes providing an opportunity for service providers to recover their efficient financing costs. This is discussed in detail in section 16.3.3. • Sapere concluded that our current approach delivers the intended rate of return regardless of whether actual inflation is above or below the forecast of inflation.

428 CRG, *Submission to discussion paper, inflation review 2020*, July 2020, p. 2; EUAA, *Submission to discussion paper, inflation review 2020*, July 2020, p. 3.

429 ECA, *Submission to discussion paper, inflation review 2020*, July 2020, p. 4.

430 ENA, *Submission to discussion paper, inflation review 2020*, July 2020, p. 88.

431 Sapere, *Target return and inflation - Input to the AER Inflation Review 2020*, 30 June 2020, p. 11.

Comment in Submission	Our Response
APA Group submitted that their modelling indicates that the current regulatory approach to inflation does not, in general, deliver a target ex-ante real rate of return, although it might do so in very specific circumstances.[432] Noted that this can occur when 'actual inflation turns out to be the same as expected inflation, and if the expectations of inflation incorporated in nominal rates of return on equity and debt are the same as expected inflation.'[433]	As provided section 16.1, we consider that the current regulatory framework delivers the initial real rate of return. We engaged Sapere to provide advice in relation to whether the regulatory framework successfully delivers the current target. Their analysis concluded that our current approach delivers the intended rate of return regardless of whether actual inflation is above or below the forecast of inflation.[434] On this basis, we do not agree that the ex-ante real rate of return is only delivered when actual inflation turns out to be the same as expected inflation.
APGA submission noted although our framework of RFM, PTRM and annual pricing process does intend to deliver an expected real rate of return, the approach of using a non-market-based inflation forecast means it is not able to meet the framework's objectives.[435]	We have provided our response to the use of market-based measures for estimating expected inflation in chapter 12, and our response to stakeholder submissions in appendix C. Our draft position is that we have decided not to use market-based measures as a method for estimating expected inflation. This is because we consider the biases and distortions within the measure diminish its use in providing estimated inflation in our regulatory framework.
Other Groups	
Spark Infrastructure submitted that that the expected real rate of return has not been delivered. Noted that the PTRM needs to remove either from the nominal cost of debt and equity:[436] • the inflation embedded in the nominal cost of equity and/or debt • the inflation expectation that is expected to be provided via revenue and RAB RFM indexation over the regulatory period.	We consider that the current regulatory framework delivers the initial real rate (derived from the initial nominal rate of return less our estimate of expected inflation) plus actual inflation outcomes over the regulatory period. As provided in section 16.1, we consider this occurs irrespective of the actual rate of inflation. We note that this is consistent with Sapere's analysis,[437] which is detailed further in section 16.1.
CitiGroup's submission stated that the sustained deviation between the expected and actual inflation will deviate away from the NPV neutrality framework, which affects the delivery of the initial real rate of return.[438]	We consider that if we achieve an ex-ante nominal return, we are providing NPV correct compensation in the long run regardless of whether we target a real return using a 10 year estimate of expected inflation or a real return using a 5 year estimate of expected inflation.
CitiGroup's submission noted that the sustained deviation also elevated the risk profile given the revenue allowance is neither inflation-linked nor providing the correct theoretical rate of return	We have assessed the risk faced by equity holders in our draft position. We consider that service providers are likely already compensated for this risk as part of the Beta estimation in their rate of return. This is further discussed in section 16.1.

[432] APA Group, *Submission to discussion paper, inflation review 2020*, July 2020, p. 2.
[433] APA Group, *Submission to discussion paper, inflation review 2020*, July 2020, p. 2.
[434] Sapere, *Target return and inflation - Input to the AER Inflation Review 2020*, 30 June 2020, p. 11.
[435] APGA, *Submission to discussion paper, inflation review 2020*, July 2020, p. 2.
[436] Spark Infrastructure, *Submission to discussion paper, inflation review 2020*, July 2020, p. 11.
[437] Sapere, *Target return and inflation - Input to the AER Inflation Review 2020*, 30 June 2020, p. 11.
[438] CitiGroup, *Submission to discussion paper, inflation review 2020*, July 2020, p. 8.

G Response to submissions on whether the framework should change (issue 3)

This appendix includes a detailed response to stakeholder submissions on 'Issue 3' in the discussion paper.

Table G.1 Our response to submissions on issue 3

Comment in Submission	Our Response
Consumer Groups	
The submissions from the CRG,[439] ECA[440] and PIAC[441] all noted concern about changing the current framework, noting that impacts would need to be modelled so that any changes advanced the NEO and NGO, and are in consumers' interests.	Our draft position does not propose a change to the current regulatory framework. We agree that consistency of regulatory approach is an important consideration.
MEU's submission proposed the implementation of ex-post adjustment for the difference between forecast and actual inflation. This would appear to target the nominal rate of return on capital.[442]	Our draft position does not propose a change to the current regulatory framework. We have noted that a change to a nominal approach as proposed by MEU would involve a significant change to our regulatory framework as described in chapters16 and 17 and appendix I.
Dr Ron Ben-David's submission proposed an alternative approach, where the service provider would estimate the expected inflation pursuant to an incentive mechanism.	Dr Ben-David's submission highlighted some challenges in regulatory design, including the information asymmetry between service providers and the regulator and the resource and information asymmetry between consumers and service providers.[443] He then suggests two principles that might be followed to enhance consumer confidence in the regulatory framework: the framework is free of bias (does not favour any party or group of parties at the expense of another party or group of parties to a regulatory decision); and the framework does not afford advantage as a result of special pleadings, gaming, or undue influence.[444] In relation to estimating expected inflation, he suggested a possible way to resolve the regulatory challenge is to absolve the AER of the responsibility for estimating expected inflation, instead requiring service providers to do this under an incentive scheme that rewards them for submitting their true expectations.[445] We have considered the submission from Dr Ron Ben-David and do not propose an expected inflation incentive

439 CRG, *Submission to discussion paper, inflation review 2020,* July 2020, p. 3.
440 ECA, *Submission to discussion paper, inflation review 2020,* July 2020, p. 4.
441 PIAC, *Submission to discussion paper, inflation review 2020,* July 2020, p. 1.
442 MEU, *Submission to discussion paper, inflation review 2020,* July 2020, pp. 8-9.
443 Dr Ron Ben-David, *Submission to discussion paper, inflation review* 2020, July 2020, pp. 4-5.
444 Dr Ron Ben-David, *Submission to discussion paper, inflation review* 2020, July 2020, p. 5.
445 Dr Ron Ben-David, *Submission to discussion paper, inflation review* 2020, July 2020, pp. 7-8.

Comment in Submission	Our Response
	scheme in this draft proposal. However, we will consider his submission further in the future and are interested in other stakeholders' views on his submission.
Service Provider and Industry Groups	
The ENA submission noted that a hybrid approach is needed as a prudent and efficient service provider issues nominal debt and is contractually required to make nominal interest payments; and that our regulatory allowance does not match the efficient costs that the benchmark efficient network is contractually required to pay.[446] The ENA also noted that the solution is to match the regulatory allowance to the efficient costs that the benchmark entity is contractually required to pay. In assessing the change to the regulatory framework, the ENA noted that consumers should only be asked to pay the benchmark efficient cost of providing the service. [447] APGA also submitted that a hybrid approach should be used. APGA interpreted the outcomes of our 2017 Inflation Review, that implicit in our stance is:[448] • The networks can in fact choose between real and nominal debt; and • The AER's current models and methods deliver compensation commensurate with this. APGA considered that neither of these views are correct. APGA noted that it is not clear that service providers can fund themselves with real debt, providing that the issuance of indexed corporate debt in Australia is less than the nominal debt associated with AGIG's three regulated businesses. APGA noted that this evidence concludes that the service providers do not in fact have a choice between indexed and nominal debt.[449]	When making our draft position, we considered the use of a hybrid approach and noted that there are a variety of methods in which a hybrid method could be implemented. The hybrid approach proposed by ENA would move to a nominal rate of return framework only for debt capital and would retain a real return framework for equity capital. This would be done by treating debt separately to equity. Our draft position is to maintain the current framework. We note that there are number of concerns with the use of a hybrid approach as noted by consumer groups as to whether such a change would be in consumer's interests.[450] Our draft position is that we do not consider a hybrid approach will better achieve the NEO or the NGO. Our analysis is that a hybrid approach may reduce the financing risk of service providers in relation to servicing their nominal debts. However this will result in the RAB varying in real terms. Further additional inflation risk will be placed on consumers who may see their prices vary by more in real terms. These concerns indicate that the consumer impact would need to be explored before a hybrid approach could be implemented. Insufficient evidence has been provided by stakeholders or our experts in response to our Discussion Paper to suggest that consumer's interests would benefit from a change to a hybrid approach. In response to service providers issuing debt in nominal terms, we consider that there is correct compensation in NPV terms for their cost of debt and equity under the current 'real return' approach flowing from the interaction of nominal rate of return with the PTRM and RFM. Our draft position is that the way service provider issue debt or equity does not alter this NPV calculation. We note that in the determination of the rate of return, the interest rate risk that service providers bear under the framework is compensated and remains appropriate. Also service providers are able to manage this interest rate risk in a number of ways if they consider this is necessary, including via alterations to their capital

446 ENA *Submission to discussion paper, inflation review 2020,* July 2020, p. 18.

447 ENA, *Submission to discussion paper, inflation review 2020,* July 2020, pp. 24-25.

448 APGA, *Submission to discussion paper, inflation review 2020,* July 2020, p. 18.

449 APGA, *Submission to discussion paper, inflation review 2020,* July 2020, p. 18-19.

450 CRG, *Submission to discussion paper, inflation review 2020,* July 2020, p. 38; ECA, *Submission to discussion paper, inflation review 2020,* July 2020, p. 4; PIAC, *Submission to discussion paper, inflation review 2020,* July 2020, 29 July 2020, p. 1.

Comment in Submission	Our Response
	structure. This was also reiterated in the expert advice of Sapere, where they provided that a shift to target a real return on equity would: 'intervene in the capital structure decision and thus result in a less efficient allocation of the risk of financing decisions.' Our draft position noted other concerns with the hybrid approach. We are not aware of any other regulators who have employed a hybrid approach. As the impacts and consequences are untested, we are unsure of the impact on the RAB if debt and equity is treated differently. Further we note that changing to a hybrid approach, does not remove the requirement to determine an estimate of expected inflation to determine the real return on equity.
The submission from ATCO expressed support for a nominal approach after transitioning from a hybrid approach.[451]	We note that a full nominal approach has limited support from stakeholders, especially equity investors who appear to prefer to receive real returns. A change to a nominal approach has the same issue as change to the hybrid approach, which is whether a change would be in consumers' interests, however we are not satisfied, based on the material currently before us, that such a change is in the long-term interest of consumers. In assessing its use, our draft position is that we may prefer the use of a nominal approach to a hybrid approach. However based on the information provided by stakeholders and our experts in response to our Discussion Paper, we do not consider a nominal approach will further the interests of the NEO or NGO.
Other Groups	
Aurizon submitted that the regulatory financial models used in its regulatory decisions (for rail) as an option for a hybrid model.[452] This version of the hybrid model involves not applying the CPI-X mechanism to any years in the regulatory period. This would involve applying the first year pricing effect to all years in the regulatory period.	We note that a change to the model used in Aurizon's regulatory financial models would involve a change to the NER. Currently, actual inflation is used to roll forward the RAB from one regulatory period to the next,[453] which requires allowed revenue to be updated each year using actual inflation in the CPI-X formula. This is because the (electricity) rules require that the use of actual inflation for rolling forward the RAB from one regulatory control period to the next to be consistent with the method used in the control mechanism to update revenues in the annual pricing process. Although we appreciate the simplicity of this approach, this hybrid model would involve fundamental changes to the NER, and we are not satisfied, based on the material before us, that this option would be in the long-term interests of consumers.

451 ATCO, *Submission to discussion paper, inflation review 2020,* July 2020, p. 6.

452 Aurizon, *Submission to discussion paper, inflation review 2020,* July 2020, p. 12.

453 NER, cll. 6.5.1(e)(3) and 6A.6.1(e)(3).

Comment in Submission	Our Response
Spark Infrastructure noted whether or not a real, nominal or hybrid approach is targeted should not be the subject of the 2020 Inflation Review.[454] However, Spark Infrastructure noted its support for a hybrid approach, where the same estimate is used to deflate the nominal return on debt to real is also used to roll forward the debt proportion of the RAB.[455] For the equity proportion, Spark infrastructure submitted that the inflation estimate should 'have strong congruence to market expectations of inflation, rather than be anchored to the RBA's target range.'[456]	Our draft position is to maintain the current framework. We note that there are number of concerns with the use of a hybrid approach as noted by consumer groups as to whether such a change would be in consumer's interests.[457] Our draft position it that we do not consider a hybrid approach will better achieve the NEO or the NGO. For further commentary, refer to response provided in relation to ENA's submission for a hybrid approach.

454 Spark Infrastructure, *Submission to discussion paper, inflation review 2020,* July 2020, p. 12.

455 Spark Infrastructure, *Submission to discussion paper, inflation review 2020,* July 2020, p. 11.

456 Spark Infrastructure, *Submission to discussion paper, inflation review 2020,* July 2020, p. 11.

457 CRG, *Submission to discussion paper, inflation review 2020,* July 2020, p. 38; ECA, *Submission to discussion paper, inflation review 2020,* July 2020, p. 4; PIAC, *Submission to discussion paper, inflation review 2020,* July 2020, p. 1.

H Issues with market-based data as indicators of expected inflation

Table H.1 Issues with swaps as an indicator of expected inflation

Bias	Explanation
Hedging Costs	Likely to result in potential overestimates of expected inflation. If there is greater demand for the fixed leg than the floating leg dealers may hedge their short exposure in the swap market by taking offsetting exposures in other markets, such as bond markets. In taking these positions dealers are likely to incur hedging costs. Hedging costs include all costs associated with opening, maintaining and closing positions in the market. The zero coupon inflation swap rate may be affected by the hedging costs incurred by swap dealers. Swap dealers may pass on these hedging costs in the form of higher inflation swap rate quotes. In this case, hedging costs may drive a wedge between the inflation swap rate and the market-expected inflation rate. The ACCC/AER working paper #11 found that academic literature suggests that hedging costs may be minor, but there are not many studies to support drawing robust conclusions. As the demand for the fixed and floating leg will change under different market conditions this bias is likely to be time-varying.
Inflation Risk Premium	Likely to result in potential overestimates of expected inflation. There may be a number of arbitrage and transaction costs associated with hedging the short exposure in the inflation swap market. Hedging may also be imperfect because there may be mismatches in the timing, size and maturity of the cash flows. Hedgers seldom create a perfect hedge because the marginal cost of hedging rises sharply as the risk minimising hedge ratio is approached. The hedger will select a hedge that is less, perhaps substantially less, than the risk-minimising hedge ratio.[458] As a result, swap dealers short in inflation swaps may still require an inflation risk premium to compensate them for inflation uncertainty that persists due to imperfect hedges, and this premium may be included in the published inflation swap rate. This potential bias is likely to be time-varying when inflation expectations are more uncertain.
Inflation Indexation Lag	Inflation rate swaps are also subject to indexation lag, which may influence the inflation swap rate such that the raw inflation swap rate may depart from the expected inflation rate. The floating leg of the zero coupon swaps is explicitly matching the length of the reference CPI date. The lag on the Australian zero coupon inflation swap is moderate. Bloomberg and Zine-eddine (2014) identify the lag as 3 months. Because the swap inflation rates are not adjusted for indexation lag, the swap contract is referenced to inflation for a period that starts before the date on which the contract is priced and ends before the contract matures. Therefore, the estimated forward inflation curve from inflation swaps will not entirely capture forward inflation rates, but also include some historical inflation determined by the extent of the indexation lag. This bias is potentially small due to the short lag on indexed CGS and is not likely to be time-varying.
Counterparty default risk	The risk associated with an inflation swap is that the counterparty will fail to fulfil its obligations outlined in the swap agreement. This default risk is known as counterparty risk and as such, default risk premia may be included in inflation swap rates. While the presence of this risk premia is a relatively well known, the effect of counterparty default risk on zero coupon inflation swap rates may not be significant. This premia could result in overestimates of expected inflation and is not likely to be time-varying.
Liquidity premia	Likely to result in potential overestimates of expected inflation. Zero coupon inflation swap rates may also contain liquidity premia, which may drive a wedge between the raw inflation swap rate and expected inflation rate. A-priori liquidity premia may be near zero since swaps can be created as required and there is no supply limitation. Observations of Australian data suggest that this liquidity premia may be negligible.[459] If the inflation swap method includes a liquidity premium it is likely to produce

[458] Charles Howard and Louis D'Antonio (1994), '*The Cost of Hedging and the Optimal Hedge Ratio', The Journal of Futures Markets*, 14(2), pp. 237-238.

[459] See ACCC/AER Working Paper #11*, Consideration of best estimates of expected inflation: comparing and ranking approaches*, April 2017, pp. 81–85.

Bias	Explanation
	overestimates of the expected inflation rate. Furthermore, the liquidity premium is likely to be greater during periods of uncertainty when investors' appreciation of liquidity risk may have changed.

Source: ACCC/AER Working Paper # 11, pp. 75–76.

Table H.2: Issue with bond break-even as an indicator of expected inflation

Bias	Explanation
Fitting a yield curve	The approximate matching of 10 year maturities of nominal and indexed CGS is necessary for the calculation of the 10 year break-even inflation rate. However, a match of such maturities is unlikely to occur given the relatively few tenors of outstanding indexed CGS. Therefore, calculations of break-even estimates may require yield curve models to interpolate estimates of yields obtained from indexed and nominal CGS with different tenors. The consequence of using yield curve models is that the break-even estimates are unlikely to reflect mark-to-market expectations of inflation, and the estimates are likely to vary depending on the yield curve models chosen. Deacon and Derry (1994) and Deacon et al. (2004) find that break-even estimates may vary considerably depending on the yield curve models employed.
Liquidity premia	Indexed CGS are likely to be substantially less liquid than nominal CGS. This implies that liquidity premia included in the yields on indexed CGS may be greater than the liquidity premia included in the yields on nominal CGS. The difference between liquidity premia, or the differential liquidity premia, is likely to drive a wedge between the bond break-even inflation estimates and inflation expectations. The differential liquidity premia are likely to be greater during periods of uncertainty when investors' appreciation of liquidity risk may have changed. In such a situation, the yield spread between nominal bonds and inflation indexed bonds is likely to narrow – a narrowing that is caused by greater uncertainty, growing differential liquidity premia, and not necessarily a fall in inflation expectations.
Inflation risk premia	The inflation risk premia arise because holders of nominal bonds are exposed to inflation risk, where there is a probability that the actual inflation rate will not match the expected inflation rate. As a result, nominal bondholders may demand compensation for bearing this risk. Inflation risk premia may be positive or negative, depending on whether there are concerns about inflation or deflation.
Convexity bias	Bond prices are a convex function of their respective yields. Therefore, if yields are volatile, giving effect to gains being larger than the losses, bond prices may rise. The rise in the bond prices push down their forward yields, below their expected future yields. The difference between forward yields and expected future yields on a bond is the 'convexity effect'. The size of the convexity effect is likely to be different for nominal and indexed bonds. The difference in the magnitude of the convexity effect for nominal and indexed bonds may result in the bond break-even inflation estimates departing from market expectations of inflation by the amount of a 'convexity bias' (other things unchanged). Convexity bias is sensitive to the relative volatility of forward yields on nominal and indexed bonds. Therefore, the scale of convexity bias estimates may change if relative forward yield volatilities change over time.
Inflation indexation lag	A perfectly indexed CGS would pay a real coupon amount that is adjusted by the increase in the CPI between the issue date and the time of payment. However, there are unavoidable lags between the actual movements in the CPI and adjustments of indexed bond cash flows. Indexation lag may result in the forward yields on indexed CGS being calculated on the basis of both historical inflation rates and expected future short-term inflation rates. The effect of indexation lag on indexed CGS yields may be significant during periods of significantly above and below-trend inflation.
Inflation risk premia in indexed bond yields: indexation lag premia	As a result of indexation lag, the real return on indexed bonds may be exposed to some inflation risk. There is research which finds that inflation risk premia may be embedded in indexed bond yields to compensate investors for such risk. This is known as indexation lag risk premia. Risa (2001) finds that the yields on UK 10 year indexed bonds included an indexation lag risk premium of approximately 3.3 basis points. However, Risa considers that this premium is not economically relevant in size. D'Amico et al. (2016) find an indexation lag premium on the yields on 10 year TIPS varies between –5 and 3 basis points.
Inflation risk premia in indexed bond yields: post-	Tax regimes in existence tend to cause post-tax real returns to remain uncertain even if pre-tax real yields are known. Since tax is levied on the nominal yield, not the real yield, the tax system reintroduces inflation risk for indexed bonds. Post-tax real yields may become uncertain and variable if inflation is uncertain. If the demand for bonds is a function of their expected post-tax returns, pre-tax indexed bond

Bias	Explanation
tax variability of indexed bond cash flows	yields may include inflation risk premia to compensate investors for the potential uncertainty of post-tax real returns. The existence of inflation risk premia in indexed bond yields may result in bond break-even inflation estimates departing from market expectations of inflation.
Mismatched pattern of cash flows	Christensen et al. (2004) argue that even if nominal and indexed bonds have the same maturity, differences in the pattern of coupon payments (resulting in differences of duration and convexity of each bond) may expose each bond to different discount factors. In real terms, the coupon payments on indexed bonds are fixed, while the coupon payments on nominal bonds decline in real terms over their maturity. Since cash flows that arrive later in time are discounted more heavily, the price of the indexed bond will be lower and therefore the BBIR may produce downwardly biased estimates of expected inflation. Christensen et al. note that the size of this bias will not be constant through time since it is a function of the coupon and maturity of nominal and indexed bonds and the term structure of interest rates. They find that observed volatility of bond break-even estimates may be due to mismatched cash flows and not to changes in inflation expectations.
Sensitivity to short-term inflation expectations when calculated from coupon-paying bonds	When bond break-even estimates are calculated from the yields on coupon-paying bonds, the estimates may become more sensitive to changes in short-term inflation expectations compared to an approach that is calculated from yields on zero coupon bonds. As a result, if the term structure of inflation expectations is not flat, relatively volatile short-term inflation expectations may change the bond break-even estimates, even if the long-term market expectations of inflation are unchanged.
Changes to the demand for and supply of indexed and nominal CGS that are unrelated to changes to inflation expectations	There may be changes to the demand for and supply of nominal and indexed CGS that are unrelated to changes in inflation expectations. As a result, relative yields and bond break-even inflation estimates may change even if the term structure of inflation expectations is unchanged. For example, changes to the relative supply of nominal and indexed CGS, changes to investor risk aversion, slow moving capital and capital availability may result in a movement of the relative yields that may be unrelated to changes in inflation expectations.
The effect of the deflation floor on the yields of indexed CGS	Indexed CGS have a 'deflation floor' – coupon interest payments will not be based on a capital value less than the face value and payment of the principal cannot fall below the face value. If deflation becomes a concern, the deflation protection of indexed CGS becomes valuable, pushing up indexed CGS prices and reducing indexed CGS yields. During such episodes, the effect of the deflation floor on indexed CGS may influence bond break-even estimates. For the US, D'Amico et al. (2016) identify the effect of the deflation floor as a potential driver of bond break-even estimates. They find that the deflation floor affects the yields on 10 year TIPS by about 5 basis points during normal times but widening to -20 basis points during the recent crisis.
Personal price indices and the substitution effect	In their estimates of the bond break-even inflation rate for the US, Christensen and Gillan (2012) find that the inflation risk premium in the estimates remained negative even after maximally correcting for the liquidity premium. Christensen and Gillan argue that this may be due to TIPS yields being higher than they otherwise would be for two reasons. Firstly, the CPI may overstate true inflation outcomes because the substitution effects have not been considered. Secondly, the personal price index of investors may be different to the CPI and therefore TIPS are only a partial hedge for inflation risk. Consequently, investors may demand a risk premium for the remaining exposure to an imperfect inflation hedge. The influence of the substitution effect and personal price indices on indexed bond yields may result in bond break-even inflation estimates departing from market expectations of inflation.

Source: ACCC/AER Working Paper # 11, Consideration of best estimates of expected inflation: comparing and ranking approaches, April 2017, pp. 33–36.

I Does our framework and approach deliver what it is supposed to?

This appendix provides further detail on how our framework delivers its target and the causes of (minor) deviations from this target.

To assess whether our current approach delivers the initial real rate of return it is necessary to consider the complex interactions between:

- different regulatory processes—that is, the impact of inflation throughout the PTRM, annual pricing adjustments and RFM
- multiple regulatory periods—that is, where lagged series are used and overcompensation in one period may be offset by under-compensation in the next
- the allowed rate of return and direct inflation adjustments—that is, compensation for inflation can be provided via an ex-ante risk premium or an ex-post adjustment to cash flows.

We consider that the current regulatory framework delivers the intended target, the initial real rate (derived from the initial nominal rate of return less our estimate of expected inflation) plus actual inflation outcomes over the regulatory period. This is delivered irrespective of the actual rate of inflation.

We commissioned Sapere to provide advice on whether the regulatory framework successfully delivers the current target. Sapere's analysis concluded that our current approach delivers the intended real rate of return regardless of whether actual inflation is above or below the forecast of inflation.[460] Stakeholder submissions to the discussion paper also generally agreed that the current approach successfully delivers the expected real rate of return.[461]

We appreciate however, that the delivery of the initial real rate of return target is not exact. As noted in the discussion paper, and in Sapere's report, there are a number of causes that result in the initial real rate of return not being exactly delivered.[462] In general, the outcome of these effects is that these deviations are minor and symmetrical. These deviations arise because of practical limitations on when inflation outcomes are known.

In its submission to the discussion paper, APA submitted that the current regulatory approach did not deliver a target initial real rate of return.[463] It modelled a case where the estimate of expected inflation in a single period is higher than previous and subsequent actual inflation. It noted that under this scenario there was an under-

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460 Sapere, *Target return and inflation - Input to the AER Inflation Review 2020*, 30 June 2020, p. 11.

461 See Table 1 in Chapter 9 for a summary of stakeholder submissions on whether the expected real rate of return is delivered as part of the current framework.

462 Sapere, *Target return and inflation - Input to the AER Inflation Review 2020*, 30 June 2020, p. 12–14.

463 APA Group, *Submission to discussion paper, inflation review 2020*, July 2020, pp. 2–3.

recovery of capital and the initial real rate of return was not delivered. The submission provided a chart of the difference in revenues, but did not provide the real return that was expected or delivered under the modelling.

Analysis that we presented at the technical workshop held in August confirmed the analysis by Sapere for this review, and in 2017 that even in cases where the estimate of expected inflation is consistently higher than actual inflation the initial real rate of return is generally delivered.[464] We conducted further analysis using the inflation simulator assuming actual and expected inflation are equal to 2 per cent. In the case where a single period (period 3) uses an estimate of expected inflation of 2.5 per cent, the delivered real rate of return is actually marginally exceeded over the long-term. This is due predominantly due to the first year pricing effect for that period, where 2.5 per cent is used to set first year revenues instead of actual inflation of 2 per cent. As discussed below, we do not consider this deviation to be material.

I.1 Deviations from initial real rate of return

The two primary effects that result in the initial real rate of return not being exactly delivered are due to how first year revenues are set (first year pricing effect), and the use of lagged inflation where actual inflation is not yet available (inflation lags). There are also other second-order inflation effects that may impact on the delivery of the initial real rate of return to a lesser extent.

We discuss these effects below.

First year pricing effect

Our standard approach for setting revenues allowed to be recovered from consumers through tariffs is as follows:

- First year allowed revenue is set equal to the nominal smoothed revenue as calculated in the PTRM.

This means expected inflation used in the PTRM revenue calculation is embedded in that revenue value. Prices for year 1 are set to recover this revenue allowance.

- For all subsequent years in the regulatory period, allowed revenue is calculated by adjusting the previous year's allowed revenue by the CPI–X mechanism.

This takes the X factor calculated in the PTRM, which represents the annual change in required revenues in real dollar terms, and adds on actual (one-year lagged) inflation.

The use of expected inflation in the first year, instead of (lagged) actual inflation, will result in a deviation from the intended real rate of return. This effect was noted in our

[464] AER, *Technical workshop presentation*, August 2020. Available at: https://www.aer.gov.au/system/files/AER%20-%20Technical%20workshop%20presentation%20-%20August%202020.pdf

2017 review, and in our discussion paper.[465] It was also demonstrated in the analysis presented at the technical workshop, and identified in the Sapere report.[466]

This first year pricing effect appears well understood, and has been present in the regulatory framework for more than fifteen years. We do not consider that the first year pricing effect requires any changes to the regulatory framework because it is:

- relatively small
- symmetric, which means the net effect will reduce across multiple regulatory periods (provided the estimate of expected inflation is unbiased)
- brings with it some implementation characteristics.

None of the submissions we received proposed to remove the first year pricing effect. However, Aurizon Network noted that an alternative 'hybrid' approach used in its regulatory financial models is to not apply the CPI-X mechanism to any years in the regulatory period. This would in effect by applying the first year pricing effect to all years of the regulatory period.

Inflation lags

In several places the regulatory framework uses actual inflation lagged by one year instead of (unlagged) actual inflation.[467] There are two prominent examples:

- In the CPI–X annual pricing process, where lagged actual inflation is used by almost all service providers in years 2 to 5 of a regulatory period.
- In the RFM, where lagged actual inflation is used by most service providers to convert new capital expenditure from nominal terms to real terms and vice versa; and to convert real straight-line depreciation to nominal terms.

This occurs primarily for practical reasons, because the relevant actual inflation outcome is not known in time.

We consider that there is no material inflation impact from these lags. Generally, where a one-year lagged series is used the upper bound for the revenue impact is the time value of a one year delay. However, any effect is substantially reduced as inflation is generally relatively stable year to year, and the inflation impact of these lags diminishes as a longer time period is considered and the inflation series remains unchanged.

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[465] AER, *Discussion paper – Regulatory treatment of inflation*, May 2020, p. 25; AER, *Discussion paper – Regulatory treatment of inflation*, April 2017, pp. 33–43; AER, *Final position paper – Regulatory treatment of inflation*, December 2017, pp. 63–64.

[466] Sapere, *Target return and inflation - Input to the AER Inflation Review 2020*, 30 June 2020, pp. 12 & 30.

[467] Note that even 'unlagged' inflation is lagged to allow for the 'implementation lag'; this is six months for most service providers, as actual inflation for the relevant year is only calculated and published after year is over. This implementation lag is excluded when describing 'one year lagged' actual inflation. Therefore, the actual delay is eighteen months for most service providers.

Trailing average return on debt

Under the current Rate of Return Instrument, the return on debt is updated annually based on a 10 year trailing average. This has been our approach to the return on debt since the 2013 rate of return guideline. This means that each year throughout the regulatory period the overall nominal rate of return is updated to take into account an updated return on debt value. The return on debt for each year of a regulatory period that is calculated as an average of 10 per cent of the required return on debt for the current year, and 10 per cent for each of the nine years preceding it. While the return on debt is updated each year, the return on equity and inflation expectation remains unchanged at the 10 year estimate.

As a result of updating the overall rate of return for the trailing average return on debt, the required rate of return at the final year of updates (generally year 5) will differ from the initial rate of return at the decision stage. This in turn means that the allowed real rate of return after the final update will differ from the initial real rate of return. This deviation is simply due to updates to the nominal rate of return and not due to our specific treatment of inflation.

Implicit in each year's nominal return on debt is an expectation of inflation for the 10 year debt term. As such, there are 9 years of historical inflation expectations within each year's nominal return on debt value. This mismatch between using an element of the required rate of return that is based on historical required returns and a purely forward looking inflation expectation has implications on whether the real rate of return is correctly delivered.

The 2017 review found that the current approach of targeting the initial real rate of return was compatible with our method for calculating the return on debt.[468] We consider that impact on delivery of the initial rate of return due to the application of the trailing average approach is unlikely to be material as expected inflation is generally relatively stable year to year. Any impact is also likely to be symmetrical, which means the net effect will reduce across multiple regulatory periods.

Second-order effects

We note that there may be some other areas on our regulatory models where we account for inflation that may have an impact on revenues and the rate of return. These include our calculation of tax costs and inflation assumptions used in the assessment of expenditure component costs.

In our regulatory models tax payments are modelled on the unsmoothed building blocks, rather than smoothed revenue, and calculated and assessed in strictly nominal terms, as required by the Australian Tax Office. As such, there may be inflation-driven

[468] AER, *Preliminary position paper - Regulatory treatment of inflation*, 13 October 2017, p. 59.

differences in revenue (beyond the intended delivery of a real rate of return), related to our treatment of tax costs.

Forecasts for capital and operating expenditure are input into our PTRM in real dollar terms, and then escalated to the relevant nominal terms in the PTRM using the estimate of expected inflation to calculate allowed revenues. There may be cases where an assumption for future inflation has been used in determining these forecast costs prior to being converted into the correct terms for input to the PTRM. Any interaction of inflation outside of the regulatory models (RFM, PTRM and annual pricing) has not been considered by this review. However, we consider that both these potential effects are unlikely to be material.

J Estimated impact of a hybrid

To demonstrate the impact of moving to a hybrid target, we have estimated the impact on the closing RAB after 5 years using different actual inflation outcomes. We have estimated the impact in Victoria using the values from the draft decision for the electricity distributors and the proposed change to a 5 year glide method to estimate expected inflation.

Table J.1 shows that the using a 5 year glide approach to estimate expected inflation in the PTRM results in an expected RAB at the end of 5 years of around $16.7 billion ($nominal) across Victorian distributors. In real dollar terms this is around $15.2 billion ($2021). If actual inflation turns out to be as expected—1.95 per cent on average over the period—then the closing RAB in the RFM will also be as expected (all else being equal) for both the current approach and hybrid. This closing RAB value is the present value of revenue to be recovered from consumers in future regulatory periods. There is no difference between the PTRM and RFM in both cases as the same inflation value is being used to inflate the expected RAB, and the actual RAB in each year.

If actual inflation turns out to be lower than the estimate for expected inflation then the current approach in the RFM fully reflects this lower inflation in the closing RAB. In the case presented, where actual inflation turns out to be 1.00 per cent, the result is a nominal closing RAB that is about $700 million lower than expected in the PTRM. However, in real dollar terms the closing RAB is as expected—$15.2 billion.

Under the proposed hybrid approach where a weighted-average inflation value is reflected in the closing RAB instead of simply actual inflation, the nominal closing RAB is only around $300 million lower than expected. However, in real dollar terms the RAB is around $400 million higher than expected. Under the hybrid approach, the purchasing power of the RAB has been increased, as it has increased by more than inflation. This higher RAB results means that prices for future consumers will be higher than the current approach in order to recover this higher RAB. There are around 3 million consumers in Victoria, therefore this equates to around an extra $130 ($2021) to be recovered from each consumer over the expected life of the RAB.

The converse is also applicable where actual inflation turns out to be higher than the estimate of expected inflation. In the case where actual inflation turns out to be 2.75 per cent over the period the nominal closing RAB using the current approach is $700 million higher, but the real dollar value is as expected. Under the hybrid approach, the lower estimate of expected inflation is partly reflected in the closing RAB, therefore the nominal closing RAB is only $300 million higher than expected. However, in real dollar terms the RAB is around $400 million lower than expected. In this case, the purchasing power of the RAB has decreased over the period, as the inflation reflected in the RAB is not enough to keep up with actual inflation. This lower RAB results means lower prices for future consumers compared to the current approach. The revenue recovered from consumers in this case is not enough to recover the present value of the RAB.

Table J.1 Closing RAB after 5 years under various inflation outcomes

	Closing RAB ($nominal)	Change from expected	Closing RAB ($2021)	Change from expected
PTRM expected RAB	16 700	n/a	15 200	n/a
Inflation as expected (average 1.75%)				
Current approach	16 700	0	15 200	0
Hybrid approach	16 700	0	15 200	0
Actual inflation 1.00%				
Current approach	16 000	–700	15 200	0
Hybrid approach	16 400	–300	15 600	400
Actual inflation 2.75%				
Current approach	17 400	700	15 200	0
Hybrid approach	17 000	300	14 800	–400