FINAL DECISION
Roma to Brisbane Gas Pipeline
Access arrangement
2017 to 2022

Attachment 14 – Inflation

November 2017

AUSTRALIAN ENERGY REGULATOR

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Shortened forms

Shortened form	Extended form
ACCC	Australian Competition and Consumer Commission
AER	Australian Energy Regulator
APTPPL	APT Petroleum Pipelines Limited
ARORO	Allowed Rate Of Return Objective
capex	capital expenditure
CPI	Consumer Price Index
GDP	Gross Domestic Product
NER	National Electricity Rules
NGL	National Gas Law
NGO	National Gas Objective
NGR	National Gas Rules
NPV	Net Present Value
NSP	Network Service Provider
opex	operating expenditure
PTRM	Post Tax Revenue Model
RBA	Reserve Bank of Australia
RBP	Roma to Brisbane Pipeline
RFM	Roll Forward Model
WACC	Weighted Average Cost of Capital

14 Inflation

Inflation is a general measure of an increase in prices and fall in the purchasing value of money. Inflation refers to changes in the general or overall price level, rather than prices for particular products.

Inflation affects a number of aspects within our access arrangement decision. In this attachment, we consider the inflation interactions across the post-tax revenue model (PTRM), roll forward model (RFM) and annual tariff variation process. Our estimate of expected inflation is addressed in the rate of return attachment (attachment 3).

We are currently undertaking a review of the regulatory treatment of inflation.[1] Our assessment of APTPPL's proposed inflation approach aligns with the assessment of inflation effects in the *Preliminary position* paper we released on 13 October 2017 as part of that review.

14.1 Final decision

We do not accept APTPPL's proposed changes to RBP inflation treatment in the PTRM (for the 2017–22 access arrangement period). This means:

- We do not accept APTPPL's framework for evaluating inflation effects, which identifies an inflation 'mismatch' between two specific inflation calculations—one in the PTRM, the other in the RFM. We consider that the correct framework evaluates all inflation interactions across the PTRM, RFM and annual tariff variation process.
- We do not accept that the appropriate interaction of inflation and rate of return outcome is the *ex post* delivery of the initial nominal rate of return. Consistent with past access arrangements for the RBP, we consider that the regulatory models appropriately target the initial real rate of return, plus *ex post* inflation outcomes. This approach allows the service provider to recover its efficient financing costs and aligns with the allowed rate of return objective (ARORO) and national gas objective (NGO).[2] The regulatory models deliver this target with only minor (immaterial) variation.
- We do not accept APTPPL's proposal to use lagged actual inflation (annually updated) in the roll forward of its projected capital base during the 2017–22 access arrangement period. Instead, we use expected inflation in this projected roll forward, consistent with past treatment of APTPPL's capital base. Actual inflation is then used when rolling forward the capital base to 1 July 2022 at the next access arrangement review. [3]

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1 Available at https://www.aer.gov.au/networks-pipelines/guidelines-schemes-models-reviews/review-of-expected-inflation-2017.

2 NGL, s. 23; NGR, cl. 87(2)–(3).

3 Refer to section 2.1 of attachment 2 of this final decision for further details.

The impact of inflation on revenues and asset values is included in our attachments dealing with the capital base (attachment 2), rate of return (attachment 3), and forecast depreciation (attachment 5).

14.2 APTPPL's revised proposal

APTPPL did not adopt our draft decision on inflation treatment. APTPPL's revised proposal stated that the AER's standard approach (as applied in the draft decision) would increase the likelihood of under or over recovery in future access arrangement periods (that is, wherever actual inflation differs from the estimate of expected inflation).[4]

APTPPL's revised proposal was to:[5]

- use, in the PTRM, for calculation of the total revenue for the 2017–2022 access arrangement period, a forecast of inflation which is equal to actual inflation immediately prior to the start of the period
- annually update this forecast of inflation during the access arrangement period, using lagged actual inflation, and progressively incorporate the effects of the changes in depreciation in the reference tariffs through changes to the scheduled Reference Tariff Variation Mechanism of the APTPPL RBP access arrangement
- specifically, update the year-on-year forecast of inflation using the change in the December quarter Consumer Price Index (CPI):
    - for the regulatory year from July 2018 to June 2019, the estimate of expected inflation would be the change in the CPI from December 2016 to December 2017
    - for the regulatory year from July 2019 to June 2020, the estimate of expected inflation would be the change in the CPI from December 2017 to December 2018
    - for the regulatory year from July 2020 to June 2021, the estimate of expected inflation would be the change in the CPI from December 2018 to December 2019
    - and so on to the regulatory year 2021–22.
- apply actual inflation in the RFM when establishing the RBP capital base at the start of the subsequent access arrangement period (2022–27).

APTPPL proposed the AER's standard approach to estimating expected inflation, which is to use the 'RBA method'. Under APTPPL's proposed approach, expected inflation has relatively little impact on revenue outcomes (though it is not eliminated entirely). We discuss the estimate of expected inflation in attachment 3 (rate of return).

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4 APTPPL, *Roma to Brisbane Pipeline, Revised access arrangement submission,* 14 August 2017, pp. 57–59.

5 APTPPL, *Roma to Brisbane Pipeline, Revised access arrangement submission*, 14 August 2017, pp. 60–61.

The underlying concern driving all APTPPL's proposed changes was that the standard AER inflation treatment entailed a 'mismatch' between the calculations at two different stages in the regulatory process:

- In the PTRM, where forecast inflation decreases the regulatory depreciation building block (and so cashflows within the access arrangement period)
- In the RFM, where actual inflation increases the value of the capital base (and so cashflows received in later access arrangement periods).

Where actual inflation differs from forecast inflation (technically, the estimate of expected inflation), the decrease in current period cashflows will not equal the increase in subsequent periods. APTPPL stated that this constituted under (or over) recovery of the service provider's capital investment.

The inflation approach in APTPPL's revised proposal differs from the September 2016 initial proposal. However, it aligns with the APA VTS initial proposal which altered the scope of PTRM elements using the actual inflation series,[6] and clarified the APTPPL/APA stance on inflation treatment in the PTRM.[7] As such, the APTPPL RBP revised proposal responds to reasoning in the AER's draft decision for APA VTS.[8] The APTPPL RBP and APA VTS revised proposals were submitted simultaneously and the proposed changes to inflation treatment in the PTRM are identical. The APA VTS revised proposal also includes changes to inflation treatment in the RFM that are not included in the APTPPL RBP revised proposal.[9]

14.3 Assessment approach

We consider that the different inflation treatments should be assessed by estimating the overall revenue impact of differences between expected and actual inflation. This means considering the complete interactions between:

- different regulatory processes—that is, the inflation effects throughout the PTRM, RFM and annual tariff variation process
- multiple access arrangement periods—that is, where lagged series are used and over-compensation in one period will 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.

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6 The APA VTS initial proposal was made in January 2017, and then elements of the inflation approach were revised in March 2017 in a further submission to the AER. APA, *APA VTS response to AER information request #IR003*, 3 March 2017, pp. 1, 4, 6.

7 APTPPL is part of the APA group.

8 AER, *Draft decision, APA VTS Australia Gas access arrangement 2018 to 2022*, July 2017, attachment 2 (2-19 to 2-31) and attachment 3 (3-152 to 3-161).

9 APA, *Victorian transmission system, Access arrangement revised proposal, Submission response to draft decision*, 14 August 2017, pp. 52–58, 65; APTPPL, *Roma to Brisbane Pipeline, Revised access arrangement submission,* 14 August 2017, pp. 55–61, 104–105.

The AER's assessment takes into account the operation of the PTRM, RFM and annual tariff variation processes; the inflation interactions between these three components of the regulatory system; and the link between the rate of return and the system of inflation compensation.[10] The central objective is the delivery of a nominal rate of return that reflects the *ex ante* real rate of return (derived from the initial nominal rate of return or WACC and estimate of expected inflation set in the access arrangement decision) plus actual inflation outcomes, over the total capital base. Consistent with this, when assessing the revenue impact of inflation effects, we:

- express all cashflows in real terms; rather than comparing nominal cashflows that incorporate different inflation figures
- include cashflows relating to both the return *on* and return *of* capital; rather than limiting the calculation to one component of the return of capital
- calculate the net present value (NPV) of these real cashflows using the initial implied real WACC; rather than the initial nominal WACC or a time varying (annual) real WACC.

As noted above, our assessment of inflation is closely linked to our assessment of the capital base, rate of return, and tariff variation mechanism. Our assessment approach for each of these elements has not changed since the draft decision and is set out in the relevant attachments (draft decision sections 2.3, 3.3 and 11.1.3 respectively). These sections also discuss inflation related interrelationships.

We have also set out an extensive discussion of inflation interrelationships as part of our ongoing review of the regulatory treatment of inflation.[11]

14.4 The review of the regulatory treatment of inflation

Our ongoing review of the regulatory treatment of inflation is a comprehensive review of all inflation related aspects of our regulatory processes. It includes both the gas and electricity sectors, and has considered submissions made by a large number of stakeholders, including consumer groups, investors and service providers. Inflation is not a business specific issue; we intend to consistently apply our final position from the inflation review to all gas and electricity service providers. We expect to release the final position paper in December 2017. Our preliminary position paper was released on 13 October 2017.

APTPPL, as part of the APA group, has engaged in this broader cross-industry review, including through:

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[10] Further information is available on the webpage for our inflation review - https://www.aer.gov.au/networks-pipelines/guidelines-schemes-models-reviews/review-of-expected-inflation-2017. See AER, *Discussion paper*, *Regulatory treatment of inflation,* 18 April 2017, pp. 9–13, 20–22 and 33–43.

[11] AER, *Discussion paper, Regulatory treatment of inflation*, 18 April 2017, sections 3.3 and 5.1; AER, *Preliminary position, Regulatory treatment of inflation*, 13 October 2017, sections 3.3 and 6.2.

- written submissions on the April 2017 discussion paper,[12] and October 2017 preliminary position paper[13]
- APTPPL staff making presentations at the June 2017 public forum and August 2017 technical workshop, and participating in the discussion panel at the October 2017 interactive workshop.

The preliminary position paper therefore includes consideration of the core APTPPL arguments, noting that these have evolved between initial proposal and revised proposal.[14] The reasons set out in the preliminary position paper are adopted in this final decision.

We have not completed our analysis of all the material submitted as part of the inflation review. We cannot exclude the possibility that this analysis might lead us to depart from the preliminary position and adopt different inflation treatment in the final position paper.[15] Our conclusions set out here therefore do not indicate the result of the inflation review we are currently undertaking.

Below we present a summary of our current inflation approach from the preliminary position paper.[16]

14.4.1 Outline of our current approach

Under our framework, we set the total revenue that service providers can recover from customers. We do this in an access arrangement determination process in consultation with a wide range of stakeholders. We set the total revenue allowance broadly in a two-step process:

- **Step one** – we set target revenue for each year of the five year access arrangement period so everyone has an initial indication of the prices that will be charged for the next five years.[17] We seek to establish a smooth trend in revenue across the five year period by setting an X factor for each year. The target revenue is made up of a number of components including operating and maintenance expenditure, a rate of return on the capital supplied by investors and a return of capital to investors to account for depreciation of assets. Step one uses our PTRM.

  The target revenue anticipates expected inflation over the five year period so the

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12 APA, *Regulatory treatment of inflation, APA submission in response to AER consultation*, 29 June 2017.

13 APA, *Regulatory treatment of inflation, APA submission in response to AER preliminary position paper*, 7 November 2017.

14 The most recent APTPPL submission (received 7 November 2017) was received in response to the preliminary position paper; the December 2017 inflation review final decision will fully address this material.

15 If the final position paper recommends changes to the PTRM or RFM, it will then be necessary to undertake a formal review of amendments to the PTRM/RFM so as to implement those changes. This will take until approximately April 2018.

16 This material has been lightly edited, including to refer to gas terms instead of electricity.

17 A regulatory period can be longer or shorter than five years; but we focus on the five year base case for simplicity.

target is sufficient to meet expected changes in purchasing power.[18] In this way, the target revenue reflects the amount that the network businesses need to undertake a program of works to operate and maintain the network, and to attract capital from investors.

- **Step two** – as we progress through the five year access arrangement period we update the revenue allowance each year by the value of actual inflation. If actual inflation in step two is different from the estimate of inflation we used in step one then the actual revenue being recovered over the five year period will be different to the initial target revenue we set in step one. However, the actual revenue recovered from customers through the period will reflect actual movements in inflation, and the purchasing power of the network businesses and their investors is preserved. Step two uses both our roll forward model and the annual pricing process.

This type of regulatory system is referred to as 'CPI minus X' incentive regulation. It is important to note that our target revenue for the five year period is only ever used at the time of our determination to provide everyone with an indication of the prices that will occur over the regulatory period. Once we commence the access arrangement period we start with our target revenue in the first year and then escalate this each year with actual inflation less the X factors we set in step one. This is the 'CPI minus X' mechanism in action.

The consequence of this approach is that as we progress through the access arrangement period we effectively displace the estimate of expected inflation that was built into our target revenue with the actual inflation outcome in each year as it becomes known. This applies equally to the rate of return that is incorporated in our target revenue. This approach means that service providers and their investors ultimately receive a revenue allowance with the same purchasing power as initially targeted. This is known as a real rate of return.

14.4.2 Outline of a nominal rate of return approach

The preliminary position paper also addresses two alternative inflation targets. Instead of targeting the initial real rate of return on capital, we could:

1. target the initial *nominal* rate of return on capital
2. target the initial real rate of return on *equity*.

The first of these alternatives is most relevant to the APTPPL proposal. Although APTPPL describes its inflation changes in several different ways, the core objective

[18] That is, the building blocks are expressed in nominal terms and the X factors are derived using expected inflation.

appears to be the delivery of the initial nominal rate of return. We can describe an approach that targets the nominal rate of return as follows:[19]

- **Step one** – would be similar to the current approach. We set target revenue for each year of the five year access arrangement period. The target revenue anticipates expected inflation over the five year period so the target is sufficient to meet expected changes in purchasing power.
- **Step two** – as we progress through the five year access arrangement period we apply the revenue allowance set at the beginning of the period, without any adjustment for actual inflation. The actual revenue recovered from customers over the five year period will equal the initial target revenue, regardless of inflation outcomes. However, where actual inflation differs from expected inflation the revenue recovered will not have the same purchasing power as initially targeted. The nominal rate of return is constant, but not the real rate of return achieved.

This would no longer be described as 'CPI minus X incentive regulation', since CPI plays no role in updating revenues within the period.[20] Under this approach, the service providers' purchasing power will vary inversely with inflation outcomes:

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

This description helps make clear why the CPI minus X incentive regime is desirable. Having revenue move with CPI preserves the purchasing power of the service provider and its investors, no matter the inflation outcome. Similarly, consumers pay prices that are constant in real terms (and so their purchasing power is preserved as well).

14.5 Reasons for final decision

Our final decision is to not accept APTPPL's proposed changes to inflation treatment in the PTRM (for the 2017–22 access arrangement period). Instead, consistent with our draft decision, we have applied our standard inflation approach in the PTRM (using

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[19] We describe the simplest method for implementing a nominal rate of return target. More complicated approaches are possible—for example, where different adjustments are made within an access arrangement period and between access arrangement periods.

[20] There would still be an 'X' mechanism, so smoothed revenue could vary across the five year regulatory period. The X factor would incorporate both expected inflation and any expected real changes in revenue.

expected inflation). This is also consistent with our approach in the inflation review preliminary position paper.

We consider that the regulatory models (PTRM, RFM and annual tariff variation process operating together) target the delivery of the initial real rate of return (derived from the initial nominal rate of return and expected inflation) plus actual inflation outcomes over the access arrangement period. There is a strong economic rationale behind an approach that targets the initial real rate of return. It is also consistent with the inflation treatment in preceding RBP access arrangements.

We consider that the regulatory system delivers this targeted return with only minor (inflation related) variation, and that the service provider is not materially under or over compensated. Modelling undertaken by us and by other stakeholders supports this conclusion, demonstrating that the targeted real rate of return is delivered within a small fraction of a percentage point.[21]

On a broader note, we consider the treatment of inflation in the regulatory models released with this final decision:

- is a recognised method for dealing with the effects of inflation[22]
- ensures that the capital base is recovered in full, with no over (or under) recovery[23]
- provides the service provider with a reasonable opportunity to recover at least its efficient costs[24]
- when paired with our method for estimating expected inflation (detailed in attachment 3), is consistent with the objective of a rate of return commensurate with the efficient financing costs of a benchmark efficient service provider[25]
- contributes to the achievement of the NGO.[26]

APTPPL's reasons in its revised proposal to support its inflation changes differed from its initial proposal.[27] However, they were largely similar to APA VTS' March 2017 updated initial proposal and revised proposal. Hence, the reasoning in our final decision will draw upon our reasoning in the APA VTS draft decision, and we refer below to much of this material. We also address those few areas where APTPPL has

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21 AER, *Preliminary position*, *Regulatory treatment of inflation,* 13 October 2017, pp. 60–69; see also the presentations from the August 2017 Technical Workshop, available at https://www.aer.gov.au/networks-pipelines/guidelines-schemes-models-reviews/review-of-expected-inflation-2017/initiation.

22 NGR, r. 73.

23 NGR, r. 89.

24 Incurred in providing reference services; and complying with a regulatory obligation or requirement or making a regulatory payment. NGL s. 24(2).

25 With a similar degree of risk as that which applies to the service provider in the provision of reference services. NGR, r. 87(3).

26 NGL, s. 23.

27 As noted above, the APTPPL position on inflation has evolved between initial proposal (December 2016) and revised proposal (August 2017), including as the result of further engagement through the broad review on the regulatory treatment of inflation.

clarified or extended its reasoning in response to our draft decision. We do not agree with APTPPL's assessment of the issue, which we consider arises as a result of:

- an incomplete assessment framework that does not assess all the relevant inflation interactions
- comparisons against an alternative rate of return target—the initial nominal rate of return—which is not (and was not previously) the intended *ex post* regulatory treatment.

Our detailed reasoning is structured as follows:

- targeting the initial real rate of return
- changing to an alternative inflation target
- the APA indexation 'mismatch'
- assessment of interrelationships.

14.5.1 Targeting the initial real rate of return

Our current approach targets the delivery of the initial real rate of return (derived from the initial nominal rate of return less expected inflation) plus actual inflation outcomes over the access arrangement period.[28] Targeting the real rate of return means that revenues received by the service provider move in the same direction as inflation. If actual inflation outcomes are below expected inflation, service providers recover less revenue than expected; but if actual inflation outcomes are above expected inflation, service providers recover more revenue than expected. However, in either case, the purchasing power of the network business and its investors is preserved. The real value of the revenue recovered by the service provider aligns with the initial estimate.

Relevant rules

In arguing for targeting a nominal rate of return, APTPPL stated that 'the rate of return of rule 87 is to be a nominal rate'.[29]

We do not consider that this rule requires the *ex post* delivery of the initial nominal rate of return. Rule 87(4) of the NGR states:

> (4) Subject to subrule (2), the *allowed rate of return* for a regulatory year is to be:
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> …
>
> (b) determined on a nominal vanilla basis that is consistent with the estimate of the value of imputation credits referred to in rule 87A.

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[28] We describe the rationale for targeting a real rate of return in more detail in AER, *Preliminary position*, *Regulatory treatment of inflation,* 13 October 2017, pp. 59–61, 70–75.

[29] APTPPL, *Roma to Brisbane Pipeline, Revised access arrangement submission,* 14 August 2017, p. 60.

Attachment 3 to this final decision explains how we determine the rate of return, which is set in nominal vanilla terms in accordance with the NGR. We then use that nominal rate of return to calculate the return on capital building block, consistent with rules 76 and 87 of the NGR.

Rule 87 is focused on the *ex ante* determination of the rate of return. In expectation, the initial nominal rate of return and the initial real rate of return are equivalent (because conversion between the two uses the expected inflation rate). This does not mean, however, that the service provider must receive the initial nominal rate of return *ex post*. Rather, the recognised basis for dealing with inflation is to provide the initial real rate of return combined with *ex post* inflation outcomes.[30] This inflation treatment needs to be applied consistently to both within-period revenues and changes in asset values (which affect revenue in subsequent periods). As such, it will also include an inflation adjustment in the depreciation schedules under rule 89(1)(d) of the NGR, so as to ensure that the inflation compensation is received only once.

Elsewhere APTPPL's revised proposal also stated:[31]

> The post-tax revenue model anticipates delivery of a nominal rate of return on an original cost asset base and, ultimately, a return of that asset base.

We consider that the key aspect is the forward-looking nature of the nominal rate of return. The service provider expects ('anticipates') to receive a nominal rate of return. This expectation is compatible with a framework of regulatory models that deliver a nominal rate of return equal to the initial real rate of return and *ex post* actual inflation.

This compatibility is evident from an examination of the equivalent clauses from the National Electricity Rules (NER). Clause 6.5.2(d) of the NER mirrors rule 87(4) of the NGR, specifying that the rate of return is to be determined in nominal terms.[32] This same starting point is used to determine the return on capital building block in the PTRM. Several other clauses in the NER go directly to the inflation treatment required in other elements of regulatory system, and it is the combined effect that determines the *ex post* inflation compensation received by the service provider. Clause 6.5.1(e) of the NER requires the use of actual inflation in the roll forward of the asset base. This use of actual inflation is then linked to the control mechanism, which will be of the 'CPI minus X' form where we substitute (lagged) actual inflation outcomes in place of expected inflation. Combined, this means the regulatory models will target the initial real rate of return outcome.

We consider that one consistent approach should be adopted under both the NER and NGR. This preserves regulatory consistency—including consistency with past uniform

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30 This approach has been used in gas and electricity sector decisions across Australia for more than 18 years. See AER, *Preliminary position*, *Regulatory treatment of inflation,* 13October 2017, pp. 71–72.

31 APTPPL, *Roma to Brisbane Pipeline, Revised access arrangement submission, 14 August 2017, p. 59*

32 The body text refers to distribution clauses; the equivalent transmission clauses are: NER, cll. 6A.5.4(b)(1)(ii), 6A.6.1(e)(3), 6A.6.2(d)(2), and S6A.2.4(c)(4).

treatment of gas and electricity service providers—and avoids any investment distortions arising from different treatment between the two sectors.

Economic basis for targeting the initial real rate of return

We set the allowed rate of return so that service providers can 'attract the necessary funds from capital markets for these investments and service the debt they incur in borrowing the funds'.[33] This is reflected in the 'efficient financing costs' language of the NGR. The underlying objective for the service provider is to achieve a real return consistent with the opportunity cost of capital.[34] 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 the 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 system (including the PTRM, RFM and annual tariff variation process) therefore focuses on this outcome—achieving the initial rate of return. This target is compatible with an *ex ante* nominal rate of return, as the starting point under rule 87 of the NGR.

The current approach 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.[35] The same real policy objective could be obtained without specifying that we start with a nominal rate of return, but the advantage of the current approach is that there is explicit consideration of inflation effects. Any real calculation will require conversion to/from nominal terms, and it aids regulatory transparency and consistency to publicly address these matters.

Targeting the initial real rate of return has long standing regulatory precedent. It has been applied in all AER decisions across gas and electricity sectors. It was also used in relevant ACCC energy sector decisions prior to the creation of the AER. This includes all the previous ACCC/AER access arrangements for the RBP, including in the decision for 2012–17. Targeting the initial real rate of return is also consistent with our approach to estimating the nominal rate of return, including where financial data reflects the revenue outcomes for firms regulated under this inflation approach.

As part of our review of the regulatory treatment of inflation, we commissioned Sapere Research Group (Sapere) to provide advice to us with a focus on the operation of the

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[33] AEMC, *Rule determination: Economic Regulation of Network Service Providers, and Price and Revenue Regulation of Gas Services*, 2012, p. iii.

[34] Sapere, *Efficient allocation and compensation for inflation risk*, *Report prepared for the AER*, 25 September 2017, p. 3.

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

regulatory system and the delivery of the intended rate of return target.[36] The Sapere report found, amongst other things, that:[37]

- It is an appropriate regulatory objective to target the delivery of the initial real rate of return on capital (plus ex post inflation outcomes). This target will align with the investor's opportunity cost of capital. It will fulfil the NPV=0 principle and support the national gas and electricity objectives.
- The current regulatory models (PTRM, RFM and annual tariff variation) are consistent with the regulatory objective. There is a small deviation from the target return for most service providers because of the first year pricing effect.[38]

Given that we are targeting the initial real rate of return on capital, the 'mismatch' identified by APTPPL is not an error. This is an intended feature of the regulatory system so that the purchasing power of the service provider and its investors will be preserved. The total nominal revenue received by the service provider will vary to reflect the difference between actual inflation and expected inflation.[39] The service provider will not receive the initial nominal rate of return; because this nominal rate of return included an inflation expectation that was not met. Its revenue will therefore vary in nominal terms; but not in real terms, and thereby preserve the purchasing power.

14.5.2 Changing to an alternative inflation target

In our draft decision, we noted that the inflation changes proposed by APTPPL for the 2017–22 PTRM would appear to depart from the initial real rate of return target.[40] There was some uncertainty around APTPPL's intended target in the initial proposal.[41] This uncertainty persists in APTPPL's revised proposal, which stated that the *current* framework targeted 'an annually updated rate of return on equity' and that its proposal would not significantly change this.[42] Note that targeting the return *on equity* is distinct from targeting the overall rate of return on capital (across both debt and equity). Elsewhere, APTPPL appeared to state that the current framework already targeted the

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36 AER, *Preliminary position*, *Regulatory treatment of inflation,* 13 October 2017, pp. 39–40.

37 Sapere, *Efficient allocation and compensation for inflation risk, Report prepared for the AER*, 25 September 2017.

38 The 'first year pricing effect' is discussed in detail in AER, *Regulatory treatment of inflation, Preliminary position*, 13 October 2017, pp. 61–64. Briefly, for most service providers, the 'first year pricing effect' means that the service provider recovers more or less than the initial real rate of return, depending on the difference between expected inflation and actual inflation in year one of the access arrangement period. It arises because the first year revenue target is not adjusted for CPI outcomes, but instead uses expected inflation from the final decision. From the second year onwards, CPI is used and so revenues are adjusted to reflect actual inflation outcomes.

39 Here, total nominal revenue includes within-period revenue and the claim on future period cashflows (the closing capital base).

40 AER, *Draft decision, Roma to Brisbane gas pipeline access arrangement 2017–2022,* 6 July 2017, *Attachment 3 – Rate of return* (section M.6).

41 Since APA did not include the tariff variation mechanism in its analysis framework, it was not clear if the intended target was the initial nominal rate of return or an annually updated real rate of return.

42 APA, *Roma to Brisbane pipeline, Revised access arrangement submission*, 14 August 2017, p. 60.

initial nominal rate of return on capital.[43] Most recently, APTPPL (as part of the APA group) submitted that this issue was not important:[44]

> **Real or nominal rates of return?**
>
> The debate about whether the regulatory framework should deliver a real or nominal rate of return is, in APA's view, something of a distraction.
>
> …
>
> The regulatory framework should be amended to sterilise the consequences of the inevitable differences between estimates of expected inflation previously made and actual inflation.

We consider that:

- The operation of the regulatory models to target (and then deliver) a particular inflation outcome is a critical question.[45]
- There is consensus amongst service providers (other than APTPPL) and consumer representatives that the current regulatory models target (and deliver with minor variation) the initial real rate of return on capital.[46] While this was a matter of some contention at the commencement of the inflation review, stakeholders were broadly convinced by the modelling presented at the August 2017 technical workshop on inflation treatment.[47]
- The core of APTPPL's 'mismatch' analysis is that, no matter the difference between actual inflation and expected inflation, the service provider should receive the nominal expected revenues set in the PTRM (and any departure from this is an error that should be corrected). Conceptually, this targets the initial nominal rate of return on capital. This also reflected in APTPPL's submission that we should 'sterilise' the impact of differences between actual inflation and expected inflation; this means the initial nominal rate of return is to be delivered regardless of inflation outcomes.
- Either of these approaches is distinct from an approach that targets the real return on equity (not the combined returns on debt and equity). Although APTPPL described its revised proposal as targeting the return on equity (only), it is not apparent to us that this would be the case. All of the APTPPL 'mismatch' analysis appears to apply equally to the debt and equity components of the capital base.

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43 APA, *Regulatory treatment of inflation, APA submission in response to AER consultation*, 29 June 2017, p. 17.

44 APA, *Regulatory treatment of inflation, APA submission in response to AER preliminary position paper*, 7 November 2017, p. 2.

45 There is considerable discussion on this issue in the preliminary position paper, reflecting its importance (and the many submissions from stakeholders on this matter).

46 Our preliminary position paper for the inflation review describes in some detail the reasons for deviations around the target, which we describe as small and symmetrical. The most notable deviation is the first year pricing effect. AER, *Preliminary position*, *Regulatory treatment of inflation,* 13 October 2017, pp. 61–64.

47 A summary of the technical workshop is available at https://www.aer.gov.au/networks-pipelines/guidelines-schemes-models-reviews/review-of-expected-inflation-2017/initiation.

Hence, APTPPL's revised proposal inflation changes for the PTRM would constitute a fundamental change in regulatory approach. As we noted in our draft decision, APTPPL has not provided sufficient material to address the implications of such a large shift:

- Changing to a nominal rate of return target would move inflation risk from consumers to service providers, and it would be important to carefully consider the implications for the estimation of the rate of return. There are strong regulatory consistency grounds in favour of the current approach, and we discussed these in some detail in our preliminary position paper from the inflation review.[48] One key concern is preserving consistency between the assignment of inflation risk and the risk compensation provided in our rate of return. Available financial data reflects the current approach (targeting the real rate of return) which has been in place for more than fifteen years. It is not clear how we would alter our method for estimating the rate of return to align with a nominal rate of return target. If the two were not consistent, then we would not meet the allowed rate of return objective and there would be under or over compensation for the service provider.
- Similarly, targeting the real return on equity (in conjunction with a nominal return on debt) would be a significant change in regulatory approach. Targeting the overall rate of return means that financing decisions remain the concern of the service provider, who bears the benefit or detriment of all such decisions (on the appropriate gearing level, whether to issue fixed or floating debt, whether to issue domestically or overseas, and so on). It appropriately assigns any risk arising from these financing decisions to the service provider, rather than consumers. We also discussed these issues in our preliminary position paper.[49]

However, given APTPPL's assessment framework, APTPPL's revised proposal does not provide a clear rationale in support of an initial nominal rate of return target. As we discussed above, APTPPL appeared to reject the approach of targeting a real rate of return because 'the rate of return of rule 87 is to be a nominal rate'.[50]

14.5.3 The APTPPL indexation 'mismatch'

The 'mismatch' referred to by APTPPL in its initial proposal relates to the indexation of the opening capital base each year, which reflects the annual increase in the value of the capital base due to inflation. This indexation occurs as part of the roll forward of the capital base on two separate occasions. The capital base is rolled forward:

- in projected terms in the PTRM prior to the start of the access arrangement period

[48] AER, *Preliminary position, Regulatory treatment of inflation*, 13 October 2017, pp. 71–75.
[49] AER, *Preliminary position, Regulatory treatment of inflation*, 13 October 2017, section 6.3.3.
[50] APTPPL, *Roma to Brisbane pipeline, Revised access arrangement submission*, 14 August 2017, pp. 60.

- in actual terms in the RFM for the same access arrangement period at the next access arrangement review.[51]

The projected roll forward in the PTRM, conducted in advance of the access arrangement period when inflation outcomes are not yet known, uses forecast inflation (more specifically, the best estimate of expected inflation[52]). The roll forward in the RFM, conducted at the end of the access arrangement period when inflation outcomes are known, uses actual inflation. This roll forward is then the basis for the opening capital base of the following access arrangement period.

However, the projected capital base within the PTRM is used to calculate building block revenues for the access arrangement period. The regulatory depreciation building block represents the change in the value of the capital base, and is calculated as the net total of indexation (which increases the capital base) and straight-line depreciation (which decreases the capital base).[53] Hence, regulatory depreciation can be understood as the net change in value of the capital base in a given year.

APTPPL submitted that, when actual inflation differs from the estimate of expected inflation (forecast inflation), the indexation of the projected opening capital base in the PTRM will differ from the indexation of the actual opening capital base in the RFM. This means the total compensation (combined within-period revenue and closing capital base) received by the service provider will differ from the initial estimate in the PTRM.

This 'mismatch' is not an error but the intended regulatory system as explained above. We provide an illustrative example to make this clearer and show the intended operation of the regulatory system. [54]

Illustrative example

In this example, our estimate of expected inflation is 2 per cent. This means that in the PTRM, at the commencement of the access arrangement period:

- In the return *on* capital building block (calculated as nominal WACC × indexed capital base) there is 2 per cent inflation increase in revenue above the real WACC.

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[51] Although the RFM rolls forward the capital base in actual terms, the depreciation component may be set (as is the case for APTPPL) with regard to forecast capital expenditure. Note that even where forecast depreciation is used, actual capex is still added to the capital base as part of the roll forward.

[52] APTPPL accepts the AER's approach to estimating the best estimate of expected inflation. This is discussed in the rate of return attachment.

[53] This is the usual outcome, but in the event of deflation then the indexation adjustment will decrease the capital base. Separately, it is possible for negative regulatory depreciation to occur if the rate of increase from inflation is of a larger magnitude than the rate of decrease due to nominal straight-line depreciation, and so the net effect is that the capital base increases in value.

[54] The illustrative example describes the inflation effects relevant to the reasoning in APTPPL's revised proposal. However, it includes some simplifications and is not comprehensive, in that it does not demonstrate all inflation effects in the regulatory system.

- In the return *of* capital building block there will be a 2 per cent decrease in revenue reflecting the negative adjustment for indexation on the opening capital base.
- In the projected roll forward there will be a 2 per cent increase in future revenue (the value of the closing capital base) reflecting indexation on the opening capital base.

The total inflation compensation will therefore be 2 per cent, equal to the initial estimate of expected inflation. The inflation deduction in the return of capital building block prevents double compensation for inflation. Using the estimate of expected inflation, the initial nominal WACC and initial real WACC will be consistent.

If we then assume that actual inflation is 1 per cent, below the initial estimate, then the following inflation effects occur:

- The CPI minus X annual tariff variation process applies 1 per cent actual inflation at the aggregate smoothed revenue level. This therefore equally affects the return on capital and return of capital building blocks. At the highest level, this replaces the 2 per cent expected inflation.[55]
- The RFM applies 1 per cent actual inflation when rolling forward the capital base. This will be the basis for building block calculations in the subsequent access arrangement periods, and therefore reflected in future cashflows.

The total inflation compensation will therefore be 1 per cent, equal to the actual inflation outcome. Table 1 shows inflation compensation both *ex ante* and *ex post*, with coloured boxes superimposed over the table to show the relevant regulatory process (PTRM/annual tariff variation process/RFM).

Table 1 Illustrative example of primary inflation effects

	Ex ante	Ex post
	PTRM	**PTRM & Tariff**
Return *on* capital building block	+2% expected inflation	+1% actual inflation
Return *of* capital building block	–2% expected inflation	–1% actual inflation
		RFM
Capital base change	+2% expected inflation	+1% actual inflation
Net inflation effect	**+2% (ex ante)**	**+1% (ex post)**

Source: AER analysis

[55] More technically, the CPI minus X pricing adjustment multiplies each of the component building blocks by (1+actual inflation) / (1+expected inflation). Note that this multiplier will be applied to both the return on capital and return of capital building blocks, so the negative inflation adjustment in the return of capital building block will still exactly offset the positive inflation included in the return on capital building block.

The net inflation effects in the bottom row are obtained by summing the rows above them; either in *ex ante* or *ex post* terms. These can also be interpreted as inflation compensation added to the initial real WACC. If, for example, the initial nominal WACC was 7 per cent, the initial real WACC is therefore 5 per cent (7 per cent – 2 per cent).[56] *Ex ante* we expected nominal outcomes of 7 per cent, but the *ex post* nominal outcome would be 6 per cent (5 per cent initial real WACC plus 1 per cent inflation compensation). Although total nominal revenue decreases reflecting lower actual inflation, the initial real WACC is preserved.

Table 1 can be adjusted to demonstrate the basis for the 'mismatch' identified by APTPPL in its initial proposal, which it considered prevents the delivery of the correct inflation compensation. APTPPL focused on just two elements of the regulatory system – all other elements have been removed from Table 2.

Table 2 APTPPL perspective on inflation 'mismatch'

	Ex ante	Ex post
	PTRM	**PTRM & Tariff**
Return *on* capital building block		
Return *of* capital building block	–2% expected inflation	
		RFM
Capital base change		+1% actual inflation
Net inflation effect		

Source: AER analysis

APTPPL noted that the indexation deduction in the return of capital building block used expected inflation. In Table 2, this is the –2 per cent inflation deduction in the *ex ante* column. APTPPL also noted that the indexation addition to the RAB in the RFM used actual inflation. This is the +1 per cent inflation addition in *the ex post* column. APTPPL's mismatch is the difference between these two elements:[57]

> The use of forecast inflation in the PTRM and, subsequently, the use of actual inflation in the depreciation calculations of the RFM for the regulatory period for which the PTRM was applied will, if the actual inflation differs from the forecast, result in a difference between the recovery of capital built into allowed revenue and tariffs, and the recovery of capital assumed for roll forward of the regulatory asset base.

That is, APTPPL considers the 2 per cent deduction as recovery of capital foregone in the current period because of inflation; and the 1 per cent addition as capital that will be recovered in later periods because of inflation. In APTPPL's view, where actual

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[56] This is a simplification (it would be necessary to use the Fisher equation to convert between real and nominal).

[57] APA, *Regulatory treatment of inflation, APA submission in response to AER consultation*, 29 June 2017, p. 7.

inflation is below (above) expected inflation, there is a windfall loss (gain) for the service provider. In the example above, this calculation leads to a 1 per cent shortfall.

As is evident from a comparison of Table 1 with Table 2, we consider that APTPPL has not included all the relevant inflation effects in its comparison. We now discuss these inflation interrelationships in detail.

14.5.4 Assessment of interrelationships

In our draft decision, we did not accept APTPPL's position that there was inflation related under (or over) compensation because its framework for analysing inflation effects did not appear sound. In the APA VTS draft decision we stated:[58]

> Based on the information in APA's proposal, we consider that APA's framework for assessing inflation effects appears to overlook:
>
> - The effect of inflation on other building blocks within the PTRM.
> - The effect of annual pricing adjustments within the access arrangement period, which effectively remove the forecast inflation used in the PTRM and apply actual inflation each year.
> - The alignment between the inflation received in the return *on* capital building block with the inflation deducted from the return *of* capital building block under the current approach. This alignment occurs both in projected terms (within the PTRM) and in actual terms (after considering the combined effect of annual pricing and the RFM). This is crucial because the inflation adjustment included in regulatory depreciation is directly linked to the method used to calculate the return on capital building block (that is, using a nominal WACC times the indexed capital base).
> - Consideration of the effect of these inflation changes on the rate of return. In effect, APA's proposal would appear to target the service provider receiving a fixed nominal rate of return (for the 2013–17 access arrangement period) and an annually updated real rate of return (for the 2018–22 access arrangement period). Such a fundamental change requires consideration of the overall compensation package (including *ex ante* compensation included in the rate of return) against the allowed rate of return objective under the NGR. APA's framework as presented in its proposal does not address this.
> - The implementation lags that would interfere with the alignment of its chosen components. That is, for the 2018–22 access arrangement period, a lagged actual inflation update in the PTRM would not align with the actual inflation used in APA's pricing mechanism or some elements of the RFM. Hence, it is not clear exactly how we would implement APA's proposal (for either the 2013–17 or 2018–22 access arrangement periods) in order to remove the inflation 'mismatch'.
> - Consideration of the total revenue received by the service provider after accounting for all inflation effects.

[58] AER, *Draft decision, APA VTS Australia, Gas access arrangement 2018 to 2022*, July 2017, attachment 2 (pp. 2-22 to 2-23).

We maintain our view that consideration of these interrelationships demonstrates that APTPPL is not under (or over) compensated when actual inflation differs from expected inflation.

APTPPL's revised proposal responded to two of these points.

Return on capital and return of capital

APTPPL submitted that the link between inflation in the return *on* capital and return *of* capital building blocks was not a material consideration. APTPPL agreed that these inflation components would initially align; but considered that this link would be broken when the annual tariff variation process occurred.[59]

We do not agree with this view. In the PTRM, the same inflation component occurs with positive sign in the return on capital building block and with negative sign in the return of capital building block. This is a crucial inflation relationship in the regulatory system. This occurs because:

- The return on capital building block is generated by multiplying the nominal rate of return against the indexed capital base. The nominal rate of return itself comprises expected inflation and a real rate of return, so the inflation component of this building block is expected inflation times the projected capital base (with positive sign).
- The return of capital building block is calculated as nominal straight-line depreciation less the indexation on the capital base. This indexation deduction is calculated as expected inflation times the projected capital base (with negative sign).

Hence, these two inflation components in the PTRM will be of equal magnitude but opposite sign. This occurs to avoid double compensation for inflation; the same indexation adjustment is being used to increase the value of the capital base in the projected capital base roll forward so the net effect is compensation for expected inflation once (and once only). This is included in the illustrative example above.

When the annual tariff variation process occurs, the total revenue (so all building blocks together) is modified by the CPI minus X formula. Whatever this figure is, it applies equally to the two inflation components identified above. They will still offset each other exactly with no net effect. The link is not broken—this is also included in the illustrative example above.

The service provider's inflation compensation will therefore be received:

- Through the increase in asset values in the roll forward. In the PTRM the projected roll forward uses forecast inflation; but the RFM will use actual inflation for this purpose (aligning with the delivery of the real rate of return plus actual inflation)

[59] APTPPL, *Roma to Brisbane pipeline, Revised access arrangement submission*, 14 August 2017, p. 59.

- Through the indexation of the other building block components as part of the annual tariff variation process. Actual inflation will be used to increase opex, tax and other revenue adjustments.
    - Additionally, that component of real straight-line depreciation received within the access arrangement period will be escalated using actual inflation (as a result of the annual tariff variation process). This was described as 'nominal straight-line depreciation' above and has no offsetting component in the return on capital building block.

Annual tariff variation

Our draft decision stated that APTPPL appeared to overlook the effect of the annual tariff variation process within the access arrangement period, which effectively removes the forecast inflation used in the PTRM and applies actual inflation each year.[60]

APTPPL submitted that the annual tariff variation process did not act to offset the impact of the inflation 'mismatch' in the PTRM and RFM.[61] APTPPL noted that if actual inflation was below (above) expected inflation, the 'mismatch' resulted in a closing capital base that was too low (high). In that case, the annual tariff variation process would also result in lower (higher) revenues (relative to those initially calculated in the PTRM) and so both effects were in the same direction. Hence, APTPPL did not consider that this interrelationship addressed the potential for under (or over) recovery as a result of the 'mismatch'.

We consider that APTPPL's analysis is predicated on the intended target being the initial nominal rate of return. In that case, the annual tariff adjustment would need to move in the opposite direction to the inflation related change in the capital base to restore the initial nominal revenue target. However, this is not the targeted rate of return outcome and inflation treatment. The inflation related change in asset values (from PTRM capital base to RFM capital base) and within-period cashflows (from PTRM annual revenues to annual tariff variation revenues) are in the same direction in order to preserve the initial real rate of return. Both are decreased (increased) to consistently reflect that actual inflation was lower (higher) than expected inflation.

In terms of the illustrative example, APTPPL's position is that the total *ex post* inflation compensation should equal the total *ex ante* expected inflation (2 per cent), even though actual inflation was only 1 per cent. In this case, it would mean an increase in the real rate of return received by the service provider above the initial real rate of return. Under APTPPL's approach, inflation outcomes below (above) expected inflation would cause over (under) compensation in real terms (that is, it will affect purchasing power of both the investor and consumer as discussed above).

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[60] The replacement is not complete; as noted above, there is a deviation in returns around the intended target caused by APTPPL's annual tariff variation mechanism, known as the first year pricing effect.

[61] APTPPL, *Roma to Brisbane pipeline, Revised access arrangement submission*, 14 August 2017, p. 58.

We do not consider this is the intended target of the regulatory system. Targeting the initial real rate of return means that wherever actual inflation differs from expected inflation we should see that nominal *ex post* and *ex ante* revenue outcomes differ, in order to preserve the underlying real rate of return on capital.