August 2022

Independent Panel Report on the ERA's 2022 Draft Gas Rate of Return Instrument

MICHAEL COSGRAVE, DANE ETHERIDGE, LEE SMALES

TABLE OF CONTENTS

1. THE PANEL'S APPROACH TO ITS REVIEW

This is the report by an Independent Panel (the Panel) of the Draft Rate of Return Instrument made by the Economic Regulation Authority (ERA) of Western Australia and released on 18 June 2022. It is a consensus report of the 3 members of the Panel.

The work of the Panel has a different foundation to that of the previous Independent Panel established to review the ERA's 2018 draft rate of return Guideline. Amendments to the National Gas Law (NGL) made since 2018 introduce a specific Division on rate of return Instruments and include a specific provision on the work of the Panel.

Section 30K of the NGL is set out in full hereunder.

30K. Report about draft Instrument by independent panel

(1) The ERA must, as soon as practicable after publishing the draft Instrument, establish an independent panel to give the ERA a written report about the Instrument.

(2) The panel—

(a) may carry out its activities, including giving the report, in the way it considers appropriate; but

(b) must seek to give the report by consensus.

(3) The panel must—

(a) consist of at least 3 members, appointed by the ERA, who have qualifications or experience in a field the ERA considers relevant to making a rate of return Instrument: and

Examples of relevant fields—

Finance, economics, law, consumer affairs, institutional investment.

(b) give the report to the ERA before the ERA makes the Instrument.

(4) The ERA must take reasonable steps to minimise and manage any conflicts of interest a panel member may have in relation to making the Instrument.

(5) The report must—

(a) include the panel's assessment of the evidence and reasons supporting the rate of return on capital or the value of imputation credits under the Instrument; and

(b) state whether the report is given by consensus.

(6) The ERA must publish the report on its website

Additionally, the Panel has been asked by the ERA to answer the following question:

'In your view, is the draft Instrument supported by sound reasoning based on the available information such that it can promote achievement of the national gas objective?'

having regard to a range of factors, including the effect of the draft gas Instrument as a whole rather than solely an issue-by-issue analysis. The question is identical to that asked of the Independent Panel for the 2018 Guideline.

The Panel found the question posed by the ERA to be a useful aid in determining its approach to its assessment. The task is necessarily taken against the backdrop of the overall objective of economic regulation as it pertains to monopoly gas pipelines. The ERA's question draws the Panel's attention to the national gas objective (NGO). Asking whether the Instrument can, or is capable, of promoting the NGO necessarily involves an assessment of the adequacy of the evidence and reasoning supporting the Instrument. It is rightly a different question or test than the one ultimately to be determined by the ERA in deciding whether to make an Instrument.

The ERA has set out its views on the role of the Panel in its July 2021 Engagement Process Position Paper. It considers that the role of the panel is not to propose or set particular values, or to make a separate decision and effectively assume the ERA's authority to make the gas Instrument. The findings from the panel are to assist the ERA to develop a gas Instrument that fulfils its legislated functions and objectives. (Para 56 Engagement Process Position Paper). Hereon, all references to chapters and paragraphs relate to the Explanatory Statement (ES) unless otherwise indicated.

After expressing its view that the exercise of regulatory discretion is for the regulator, the ERA goes on to say that 'the role of the independent panel is not to have a separate body proposing its own means of promoting the national gas objective or to put forward an alternative or amended gas Instrument. The independent panel is best suited to a role of reviewing whether the ERA has undertaken an effective review process; engaged with the material before it; and reached a decision that is supported by its stated reasons and the information available to it'. (Para 57 Engagement Process Position Paper)

The Panel makes the following observations about its remit. The NGL statutory provision gives the Panel the ability to report broadly 'about the Instrument' i.e., the outcome of the ERA's deliberations to date. That is unsurprising given the independence of the Panel.

However, we broadly agree with the ERA's characterisation of our tasks. It is clear from the overall legislative framework, including the timing of the Panel's report within the overall process, that the Panel's role is advisory rather than supervisory, and that the primary task for the Panel is an examination of the draft Instrument itself as well as an assessment of the evidence and reasons that support that Instrument. The Panel has referred extensively to both documents in its assessment.

The Panel's assessment is not bounded by the content of the Instrument and explanatory material. Panel members are selected for their regulatory, legal, and financial qualifications and experience and bring those skills to their assessment. Our backgrounds and experience are set out at Appendix A.

The Panel's experience in economic regulation and finance theory has led us to number of general views and understandings that have been important in forming its assessment approach. They are as follows:

- There is no single 'right' economic answer in the estimation or application of rate of return regulation. Establishing a way to implement the rate of return on capital will include estimation, involving the use of regulatory discretion, given the task is predictive and the tools imperfect.

- Consequentially, regulators acting reasonably can reach different positions on questions of contested theory, methodology and the results that follow from those choices. The ES points to a number of issues on which various regulators have taken different approaches and/or reached different outcomes (e.g., gearing assumptions Para 224, debt risk premium Para 470, debt raising costs Para 1138).

- Most strikingly, in draft decisions released concurrently, the ERA and AER have both changed their approach to the term of equity, with the ERA going from 5 to 10 years, and the AER from 10 to 5 years. In addition, each agency takes a different approach to the inclusion of international comparators in the estimation of beta.

- The inputs and methodology for estimating a regulated rate of return in the energy sector have been the subject of protracted debate and disputation over many years.

- There are a limited number of contentious issues in this Review, that nonetheless can potentially lead to substantial changes in the overall rate of return.

- Consumers are sensitive to changes in energy tariffs, including gas. This makes explanation of the regulator's role in promoting their long-term interests through efficient investment in, and efficient production and use of, gas services important, but difficult.

The Panel's approach has been to ask itself whether the ERA's consideration of the evidence before it, and the outcomes the ERA has determined, are reasonable, both in relation to the Instrument itself and the many decisions on questions of approach and methodology that support it. The Panel does not see its role as expressing a preference for particular outcomes and has not done so.

In order to aid consistency, the Panel has used its determination of reasonableness for its assessment of each of the ES's chapters, even where the issues are non-contentious. The ERA's utilization of the standard Sharpe-Lintner Capital Asset Pricing Model (CAPM) in estimating the return on equity would be such an issue.

We have then also asked ourselves whether the ES can be improved or clarified in either its reasoning or its content and made suggested amendments where we think it can.

During this examination, the Panel has had cause to ask whether the ERA has sufficiently clearly complied with substantive provisions in the NGL pertaining to rate of return Instruments.

Although we have sought to comment on the strength and weakness of arguments made by the ERA, we have not sought to determine whether the Instrument promotes the NGO to the greatest degree, or whether alternate values should have been set in its estimation.

There is one caveat to the Panel's general agreement with the ERA's characterisation of its task. It is conceivable that a Panel could reach an assessment that an Instrument or underpinning input was decided without any evidence or wholly unreasonably based on the available evidence. Clearly if that were the case, the Panel would be obligated to report on that basis to the ERA.

The Panel accepts that this is highly unlikely in a detailed regulatory process and as outlined in the next Section of this report, the Panel has no such concerns in relation to the 2022 draft Instrument and ES.

2. OVERALL ASSESSMENT AND RECOMMENDATIONS

2.1 Material Considered and Overall Assessment

The ERA has undertaken an extensive consultation process culminating in the production of the draft Instrument and ES. The Panel has read and considered the Engagement Process Position Paper, the Discussion Paper, and the various papers issued to stimulate debates on issues as part of the ERA's focussed consultations. Additionally, the Panel read and considered each of the submissions and expert reports submitted to the ERA process. The Panel also examined material from concurrent and other related regulatory processes, particularly that of the AER, given the ERA gathered evidence from the AER's expert sessions and referred to them in the ES.

The Panel considers that the ERA's consultation process has been extremely thorough. The effectiveness of that consultation depends in part on whether the ERA has sufficiently engaged with the major arguments raised by stakeholders, which will only become clear with final submissions to this Draft decision and the final Instrument. As more fully set out in following chapters, the Panel is of the view that the ERA has given due consideration to the submissions of stakeholders, although we do raise in Chapter 4 the need for the ERA to make more clear how it has directly engaged with an argument raised by the Consumer Reference Group (CRG) that the ERA need to consider how the rate of return methodology in conjunction with other aspects of the regulatory arrangements are likely to impact on risk, return and the realisation of the economic efficiency criteria.

Subject to the comments made in this and subsequent chapters, **the Panel's overall assessment is that the evidence and reasons provided by the ERA support the draft Instrument**.

As a whole, the rate of return methodology contained within the draft Instrument is, in the Panel's view, within a range of reasonable outcomes based on the available information. Taken separately, each of the individual decisions on approach or methodology appear logical.

Given that view and in answer to the question posed to the Panel by the ERA, the Panel is of the view that the draft Instrument **can** promote achievement of the NGO.

2.2 The effect of the Instrument as a whole

Notwithstanding its overall finding, the Panel believes there are steps that the ERA should consider taking prior to the finalization of the Instrument in order to satisfy itself that the Instrument will, or is most likely to, contribute to the achievement of the NGO **to the greatest extent.** Those steps should be considered whether the ERA decides to change its position on individual approaches and parameters between the draft decision and the final decision.

The ERA rightly asks the Panel to consider the effect of the Instrument as a whole rather than an issue-by-issue analysis. The Panel agrees that this is a useful characterisation for deciding whether making a new Instrument better contributes to the NGO's efficient investment, operation, and use objects than other options theoretically open to the ERA, such as moving away from modelled outcomes or retaining the 2018 Instrument.

There is however very little explicit discussion of the overall effect of the draft Instrument beyond the comparative illustrative table of the numbers of the rate of return and parameters between the 2018 Instrument and the 2022 Draft Instrument (Table 2, ES P4), and the single paragraph that follows it without further explanation.

'The ERA considers that the 2022 draft gas Instrument best delivers an efficient rate of return that supports the long-term interest of consumers. The ERA aims to promote efficient investment in, and operation of, regulated gas pipelines, and the efficient use of gas pipelines. The ERA considers that **these positions** best deliver the requirements of the National Gas Law and National Gas Rules, including the national gas objective, and the revenue and pricing principles.' (Bolding by Panel).

It is not clear whether the paragraph is a finding in relation to the Instrument, positions reached on estimation methods, or both. More importantly, there is also no summation within the Instrument or ES as to **why** the ERA has reached this view.

The Panel's principal recommendation is that the ERA present a self-contained analysis of its views relating to the overall effect of the Instrument. There are several decisions made throughout the ES that establish a framework for estimating a way to calculate the rate of return and reflect the efficiency criteria of the NGL. There is currently no section in the ES addressed exclusively to an overall assessment of the ERA's decision-making framework that both pulls together various material within the ES and reflects on what has emerged from the modelling more holistically.

The Panel is of the view that the inclusion of such a section is important for fostering confidence in the ERA's decision making as well as ensuring clear compliance with NGL requirements in relation to the making of an Instrument.

Consideration should be given to the inclusion of the following content in the assessment

- Existing Material within the ES that goes to the establishment of an assessment framework.
- Any material or ex-post analysis undertaken by the ERA that goes to the success or otherwise of the 2018 Instrument in setting a rate of return that was neither too high nor too low.
- A more detailed assessment of how the ERA has used its guiding principles in the making of the draft Instrument.
- Greater use of sensitivity analysis to explain the impact of proposed changes on both producers and users.
- Explanation that provides comfort there is an internal coherence or consistency in the various choices that the ERA has made, on approaches that affect multiple parameters of its building block model.

We discuss each of these in turn.

2.3 Existing material within the explanatory statement that goes to the establishment of an assessment framework

The Panel accepts that the ERA has substantially engaged with the primary test it needs to satisfy to fulfil its obligation to make an Instrument.

We set out Section 30D in its entirety, noting that that is not currently done in the ES.

30D. ERA to make rate of return Instrument

(1) This section applies if a rate of return on capital or the value of imputation credits is required for performing or exercising an (ERA) economic regulatory function or power.

(2) The (ERA) must make an Instrument (a ***rate of return Instrument***) stating—

(a) for a rate of return on capital—the way to calculate the rate; and

(b) for the value of imputation credits—the value or the way to calculate the value.

(3) The (ERA) may make an Instrument only if satisfied the Instrument will, or is most likely to, contribute to the achievement of the national gas objective to the greatest degree.

(4) Subject to subsection (3), the way to calculate a rate of return on capital must include a weighted average of an allowed return on equity and an allowed return on debt.

(5) In making an Instrument, the (ERA) must have regard to—

(a) the revenue and pricing principles; and

(b) other information the (ERA) considers appropriate.

We draw particular attention to Section 30(3) which sets out a state of satisfaction with respect to the NGO that the ERA must reach prior to making an Instrument. The NGO is "to promote efficient investment in, and efficient operation and use of, natural gas services for the long-term interests of consumers of natural gas with respect to price, quality, safety, reliability and security of supply of natural gas."

The Panel identified the following excerpts from the ES that go to the ERA's overall assessment framework. Although many of them are contained in the paragraph dedicated to the regulatory framework, we have also set these out in full given they are currently scattered throughout different chapters of the ES.

Para 20. The 2022 gas Instrument review approach is to:

- Take the 2018 gas Instrument as the starting point.
- Review all rate of return components for possible change.
- Assess the relative merits of any new evidence, considering any new matters raised by stakeholders

Para 54. For the 2022 gas Instrument, the ERA intends to select the methods for calculating rate of return parameters that provide an estimate that is consistent with the efficient financing costs of a benchmark efficient entity with a similar degree of risk in the provision of reference services. The best possible estimate of the expected rate of return will promote efficient investment in, and efficient operation and use of, gas network services in the long-term interests of consumers. The ERA considers that the promotion of the long-term interests of consumers and the efficiency objectives of the national gas objective and the revenue and pricing principles are best achieved through this approach.

Para 57. The ERA defines the benchmark efficient entity as a pure-play network service provider operating within Australia without parental ownership, with a similar degree of risk as that which applies to the service provider in respect of the provision of gas network services.

Para 58. The revenue and pricing principles require gas network service providers to be provided with a reasonable opportunity to recover at least the efficient costs they incur. The rate of return must remunerate the efficient financing costs of the service provider over the lives of the assets, in terms of net present value.

Para 62. The ERA will aim to determine its best estimate of an efficient rate of return, consistent with the risks involved in providing regulated gas pipeline services. This is a best possible rate of return estimate that is neither too high nor too low. The ERA considers that the best approach to estimating the efficient cost of capital is to base estimates of the parameters of the WACC on observations of market data, because market data reflects the aggregate expectations of investors.

Para 82. The ERA has determined the positions in the 2022 draft gas Instrument by selecting and applying the estimation methods for the WACC parameters that the ERA considers provide the best estimate of the efficient financing costs of a benchmark efficient entity.

Para 117. To develop the rate of return approach laid out in the 2022 draft gas Instrument, the ERA has had to satisfy itself of how the overall framework and each of its components best meets the requirements of the national gas objective. These considerations are detailed throughout the explanatory statement. The ERA considers that the approaches and methods laid out in the 2022 draft gas Instrument and explanatory statement best meet the national gas objective.

This list may not be exhaustive.

Read together, the paragraphs from the ES above could be interpreted as a finding by the ERA that, provided its 'bottom up' modelling accurately updates market data, complies with the requirement to include a weighted average of an allowed return on equity and an allowed return on debt, satisfies the revenue and pricing principles in Section 24 of the NGL, and chooses rate of return estimation methods consistent with its guiding principles, the calculation of the rate of return that emerges from that process and is contained in the draft Instrument must necessarily be the one that 'best' (to use the ERA's language in the ES) or to the greatest degree contributes to the NGO.

That is however speculation on the part of the Panel. We set out the possible interpretation not to suggest that a formulaic approach is necessarily the ERA's finding, or a preferred finding of the Panel, but to illustrate that the Panel is unclear how the ERA has arrived at its overall conclusion in the absence of the analysis of the overall effect of the Instrument that we recommend. We have suggested the addition of additional material to aid a more holistic assessment.

The Panel notes that there are alternative levels of satisfaction that would be sufficient to satisfy the Section 30(3) test. It is possible that a regulator could be satisfied that one of two alternative scenarios would emerge as a result of the making of an Instrument i.e., that the making of the Instrument **will, or is most likely to,** contribute to the achievement of the national gas objective to the greatest degree.

If it determined it was satisfied of only one of the alternatives, a prudent regulator might come to the view that any rate of return Instrument is 'likely' to contribute to the promotion of the efficiency objectives of the NGO rather than the more definitive 'will', given that the return on equity involves an estimation using regulatory judgement, but that is a question for the ERA. The current paragraph in the Executive Summary does not make entirely clear which of these alternative states of mind the ERA has come to.

As previously discussed, 'best' or 'to the greatest degree' suggests the need for some discussion of other possible outcomes as well as the discussion of the 'best' estimation methods in Para 54.

Given the ERA can make an Instrument only if it is satisfied of one of the two alternatives, a clearer overall assessment and statement of satisfaction would be required in making the final Instrument.

2.4 Material or ex post analysis undertaken by the ERA that goes to the success or otherwise of the 2018 Instrument in setting a rate of return that was neither too high nor too low

The ERA's procedural approach to its 2022 review, set out at Para 20, uses the 2018 Instrument as its starting point and determines whether changes in parameters to its methodology for estimating the rate of return are warranted. The Panel acknowledges that this approach has the benefit of simplicity and has the support of stakeholders.

It does however implicitly proceed from a position that the 2018 Instrument has been successful in meeting its objectives. That may or may not be the case. Like all rate of return instruments, the 2018 version requires an estimation of future matters with imperfect data.

The Panel would nonetheless have expected to see some analysis of the success or otherwise of the 2018 Instrument or at least the feasibility of undertaking such an assessment.

We appreciate that many of the same considerations that sit behind the ERA's decision not to use crosschecks in the current review are likely to come into play here, particularly the difficulty of separating out the effect of the Instrument from other parts of the regulatory

scheme, and other market developments. We also understand that given the likely complexity of any such analysis, pursuing it during the current review process may be ambitious.

We would therefore recommend that as part of its framework for the next review, the ERA consider the application of measures to determine the appropriateness of the previous Instrument as the starting point of the ERA's considerations.

2.5 ERA guiding principles

At Para 71 of the ES, the ERA establishes a number of guiding principles. Para 71 provides:

'When using its regulatory discretion on rate of return matters, the ERA's decisions will also be informed by the following set of guiding principles. The ERA will select rate of return estimation methods that are:

- reflective of economic and finance principles and market information
- fit for purpose
- transparent
- implementable and replicable
- sufficiently flexible as to allow for changing market conditions.'

The Panel makes the following additional observations in relation to the ERA's guiding principles.

The Panel endorses the use of guiding principles as an aid in the interpretation of the legislative objectives. If they are to be used effectively, more explicit reference to them needs to be undertaken throughout the assessment process.

The ERA appears to bound the use of its guiding principles to the exercise of its regulatory discretion and the selection of estimation methods rather than the operation of the draft Instrument. It is not clear why the ERA has so limited itself, particularly since several of the principles, such as replicability and flexibility, are arguably more attuned to the operation of the Instrument than an individual estimation.

There is comparatively little explicit use of the principles to explicitly guide or justify the selection of individual estimation methods. Some use is made in foundational decisions such as the vanilla WACC (transparent Para 115) and the use of the CAPM model (fit for purpose Para 564). While it is likely that the ERA has had regard to the transparency and fit for purpose principle in other estimation methods, it has not made that consideration explicit. It should do so.

Although the ERA has clearly turned its mind to replicability of the Instrument, as has this Panel, the ERA does not provide an overall assessment of the Instrument against the guiding principles. The Panel considers that the ERA should undertake an assessment of the consistency of the Instrument with its guiding principles as part of the overarching assessment

recommended by the Panel. The Panel's assessment of the replicability of the draft Instrument is set out in Chapter 3.

The ERA might also want to consider whether it includes stability in its principles. Both producers and users reflect on the importance of stability in promoting investment certainty and consumer confidence. The ERA accepts the desire of users for stability in tariffs as relevant to determining an approach that best meets the requirement of the NGL in its approach on updating the debt risk premium (Instrument, Para 59) but does not refer to stability elsewhere in the Instrument or ES.

The final of the ERA's guiding principles is that it will select rate of return estimation methods sufficiently flexible as to allow for changing market conditions. Less clear is how the ERA has turned its mind to flexibility, and some additional consideration of this would be desirable. We note that the AER has also undertaken scenario analysis of a range of broad economic environments to aid their judgement whether the draft Instrument can operate under a range of economic conditions. Scenario analysis may be one method of the ERA achieving this additional consideration.

2.6 Additional sensitivity analysis

Whilst recognising that the application of the Instrument occurs through the individual access arrangement of the three pipelines to which it applies, the Panel would have expected to see some analysis of the impact and effect of the Instrument as a whole, beyond the estimation of the nominal vanilla WACC and its individual components.

The Panel accepts that the ERA has given considerable attention to the application of a variety of crosschecks in Chapter 6. The ERA recognised that crosschecks may have some value in providing sense checks of estimates of the rate of return and its parameters. Despite both industry stakeholders and the CRG advocating for some consideration to be given to various crosschecks, the ERA determined not to consider financeability, RAB multiples or historical profitability as crosschecks against the overall rate of return.

In its discussion of Chapter 6, the Panel accepts that the ERA's analysis of the shortcomings of each of the proposed crosschecks and its consideration of the differing approach of other regulators mean this decision is reasonably open to it.

In the absence of crosschecks, the Panel is of the view that the ERA should consider whether it includes sensitivity analysis in its final ES to provide confidence that the ERA has considered the impact of changes it is considering making from the 2018 Instrument. The Panel accepts that the use of crosschecks and sensitivity analysis have different purposes, but both potentially have a role in promoting consumer confidence and enabling a more nuanced discussion over time on how the regulator's efficiency objectives promote the long-term interests of consumers.

The Panel has undertaken some analysis of its own on the equity beta in Chapter 10 of its report to indicate the type of analysis it might have expected to see in the ES.

The Panel also notes that the AER in its concurrent 2022 Explanatory Statement has estimated the impact of movements in the values for MRP, Beta and Term to ROE, household bills and (with Beta) revenues. (See Page 26-9 AER Draft Explanatory Statement and in particular Table 0.4)

2.7 Consistency

A further important objective in undertaking a more holistic assessment of the Instrument would be to provide comfort there is an internal coherence or consistency in the various choices that the ERA has made, on approaches that have an effect on multiple parameters of its building block model, the Panel believe such a standalone assessment is important to provide confidence that the regulator is not "cherry-picking" particular arguments.

Among the terms of reference provided to the Panel is to have regard to "the effect of the draft gas Instrument as a whole rather than issue-by-issue analysis." As such, a common theme that runs through the Panel's considerations is that of "consistency" among choices made by the ERA in drafting the Instrument. In essence, by addressing each of the components that constitute the rate of return calculation, the ERA has produced an Instrument from the "bottom-up". Consistency among decisions will help to ensure that the Instrument is also coherent from the "top-down".

The Panel acknowledges that the ERA has made efforts in identifying a consistent approach in terms of the benchmark efficient entity (Para 54) and the NPV=0 condition (Para 58). However, the Panel believes that the ERA could provide a more careful explanation as to how that consistency is maintained among decisions, and how those decisions fit together holistically.

In the following sections, the Panel highlights three examples where the Instrument could benefit from greater clarity around consistency of choices, and how they relate to choices made elsewhere in the Instrument. The identified areas would also benefit from the provision of sensitivity analysis relating to the decision made.

2.7.1 Terms for debt, equity, and inflation

The NPV=0 condition is a key principle underlying the construction of the Instrument, and the ERA has adopted an approach that seeks to satisfy this condition for the individual parameters. Meeting this condition means that the present value of the revenues received by the regulated entities is equal to the present value of the cost of assets and operating expenditure of the regulated entities in generating output. Deviations from this condition will imply either revenues are in excess of that required to induce investors to invest in the regulated entity (NPV>0) or that revenues are lower than that required to generate sufficient profit to attract investment (NPV<0).

Two methods of achieving the NPV=0 condition are described in the ES (Para 582) – the regulatory approach and the competitive approach.

The "regulatory approach" involves setting the term for the return of equity equal to the term of the regulatory period (5-years). The ERA notes on several occasions that this approach was

advocated by Dr. Lally and it is the approach favoured by the ERA in the previous rate of return Instrument.

The "competitive approach" recognises that the regulated assets will have some useful life remaining after the regulatory period ends and sets the term to match the underlying asset lives. In this case, the term will relate to the longest available discount rate, which is 10-years. The ERA notes that this approach is favoured by experts who consider "it is more closely aligned with capital budgeting and investment practice and therefore provides more efficient investment incentives relative to other investment opportunities with similar risk."

The ERA recognises (Para 577) that the AER has "adopted a preferred position that the terms for the return on equity, return on debt and expected inflation should be independently assessed. However, the AER noted that common principles underpin the choice of term in each case which may lead to the same term being applied." Certainly, consistency would be more apparent should the same term be used for each aspect under consideration.

The Panel does not express a preference on the choice between 5- and 10-year terms, only that evidence of consistency in process is more carefully explained where different selections are made, and the potential for "cherry-picking" exists. For instance, the Instrument assumes a portfolio of 10-year fixed rate debt and then adopts the prevailing 5-year interest rate swap rate as the estimate of the risk-free rate of return for debt. This choice seems to fulfil the goal of "delivering an implementable debt strategy" while relying on the "regulatory approach" to the NPV=0 principle. In contrast, when estimating the return on equity, the Instrument uses a term of 10-years for equity and the risk-free rate (which is obtained from another debt Instrument - Commonwealth Government issued bonds), to match the "requirements of efficient investors" and relies on the "competitive approach". While the ERA does offer its own consideration that the different approaches are appropriate (Para 604), the Panel believes that it is important to provide a more detailed explanation as to how the choice of different approaches is reconciled on a holistic basis. In addition, without additional explanation, this can be read as implying that the Instrument applies two different terms for the risk-free rate.

2.7.2 Benchmark sample

Consistency is also important in identifying benchmark firms and/or comparators for estimation of various elements of the Instrument, including beta, benchmark credit ratings, and gearing. While four domestic energy networks were listed in 2016 (APA Group, AusNet Services, DUET Group, and Spark Infrastructure Group) the number has declined over time. Only APA Group remains as a standalone firm following takeover bids for AusNet and Spark Infrastructure in 2021. Clearly, regardless of the choices made for the 2022 Instrument, the ERA faces an issue in maintaining an adequate sample of firms for future cycles. It is therefore appropriate that the ERA recognises the effect of this market consolidation on estimates (Para 871) and is considering alternate methods of updating the benchmark sample to include additional firms. The Panel supports the ERA's investigation into different methods of updating the benchmark sample.

In addition to the current method of using a sample of "domestic energy networks that include recently delisted firms", the ERA has considered two options to update the sample (Para 827) – "domestic infrastructure firms" and "international energy networks".

Again, the Panel does not have a particular preference as to the best method but would encourage consistency across the information provided by the ERA.

For instance, when considering the rate of return on debt, the ERA requires that observations "will be limited to the credit risk of debt Instruments where the country of risk is classified as Australia" (Para 425). This is because it ensures that observations are "reflective of risks primarily linked to economic and financial market conditions in Australia" (Para 489). As a standalone choice this is not problematic. However, when estimating equity beta, the ERA "will examine both domestic and international listed energy networks" (Para 1047) and ignore other Australian infrastructure firms (Para 1027).

The ES shows that gearing and credit ratings are relatively stable over time (Paras 261 and 407) and so it may be reasonable to assume that this would continue for some time into the future and not require a new benchmark sample. In contrast, the estimates for equity beta are more volatile (Paras 1081 and 1083) and so it is more salient to update the benchmark sample in this case. However, this reasoning is left unsaid in the ES, and this is an example of the type of rationale that would help to explain the ERA's process and provide additional comfort that the ERA is following a consistent approach.

2.7.3 Choice of weighting method

The final example of where the Panel believes consistency to be particularly important is in relation to the choice of averaging method, particularly in respect to the weights applied to different calculation methods. In several instances, the ERA has considered more than one method of calculating an input to the rate of return. In some cases, there is no single method that is superior, or without flaw, and so the ERA averages the results of the different methods. The Panel notes that even use of the simple mean implicitly suggests that the ERA has determined methods to be equally suitable. Sometimes the choice of averaging will have a significant impact on the calculated rate of return.

Perhaps the best example of this issue is in relation to the averaging method used for the market risk premium (MRP). Given that this issue is not completely resolved in academia, the discussion related to the choice of arithmetic or geometric mean (Paras 742 & 747) is sensible. There is some explanation as to placing a greater weight on the arithmetic mean (Para 765), but greater clarity could be provided as to why a 60/40 weighting is chosen (Para 773) and the impact this has on the rate of return calculation.

Another example relates to the curve-fitting techniques for the cost of debt calculation (Paras 494 & 496) where the simple average of three methods (Gaussian Kernel; Nelson-Siegel; Nelson-Siegel-Svensson) is used.

Given the previously identified concerns relating to the benchmark sample, going forward it will be more important to consider the appropriate weighting of measures estimated using domestic and international firms. An example of the issues that may arise is shown in Table 14

(Para 1083) where a decision to place greater weight on international firms would result in a higher beta estimate. In this case, the equity beta estimate for US, Canada, and UK markets is 0.89 when averaged across methods and sample periods. This estimate is considerably higher than the 0.55 obtained using only domestic firms.

An example of where the Panel believes the ERA has followed good practice is its explicit recognition of an issue with weighting in relation to the overlapping periods used to estimate the market risk premium (Para 730). The ERA uses four overlapping periods (1958 – current; 1980 – current; 1988 – current; 2000 – current) and gives equal weighting to each (Para 731). Since the post-2000 sample appears in all four periods, this gives a greater importance to more recent data.

2.8 Compliance with NGL obligations

The discussion whether the ERA should consider the introduction of a stand-alone assessment of its estimate was prompted in part by the Panel's consideration of the NGL's test that the ERA should make an Instrument only if it was appropriately satisfied in relation to the NGO.

The Panel also reviewed other mandatory obligations in the NGL for the content of the Instrument and the publication of explanatory information. The ERA has sought to address each of these issues, including with the publication of a voluminous draft ES.

The Panel suggests that the ERA should consider whether compliance with its obligations could be better satisfied, by the introduction of amended wording into the Instrument in the former case, and by considering whether all categories of required information are contained in the ES in the latter.

These suggestions are set out in greater detail in Chapters 3 and 4 respectively.

2.9 *Other recommendations from subsequent chapters*

In addition to the recommendations set above, the Panel has made a range of more detailed recommendations and suggestions in subsequent chapters. We have listed them here for ease of reference.

- In Section 4.2, We think that the ES would be enhanced by further short discussion of the trade-off between consumer's short term and long term interests, and how the ERA's decision promotes the efficient production and use of gas services as well as the efficient investment in those services.

- In Section 4.3, the Panel suggests there is a need for the ERA to make more clear how it has engaged fulsomely with the CRG's argument that there is a need to consider the extent to which the regulatory arrangements themselves affect the assumptions of the WACC method and its parameters.

- In Section 9.4, the ERA demonstrates that the number of benchmark sample firms has declined over time. The Panel recommends the ERA consider how this will impact the determination of the benchmark credit rating in the next Instrument. The ERA provides some guidance on a similar issue in relation to the equity beta (Sec 10.4.5.3) and explain whether similar methods could also be considered for debt estimates.

- In Section 9.5, the Panel recommends that the ERA provides additional clarification as to why it is reasonable for the term of the debt risk-free rate to differ from the term adopted elsewhere, such as in the risk-free rate of the return on equity. In particular, the ERA should clarify more clearly how this this is consistent with the approach taken in relation to the principle of targeting NPV=0 holistically.

- In Section 9.5, the Panel notes the empirical issues arising from estimation of the debt risk premium when the benchmark sample includes bonds with a maturity far from the 10-year term of debt. The Panel recommends that the ERA consider increasing the minimum maturity for inclusion in the benchmark sample to five years.

- In Sections 10.4.6 and 10.4.7, with respect to the market risk premium the Panel recommends the ERA:
    - gives further consideration to the appropriate use of the DGM when developing the next Instrument; and
    - in the current Instrument, more fully describe how insights from the conditioning variables were or could be incorporated into the rate of return.

- In Section 10.5.2, the Panel notes that the ERA has responded to the challenges presented by Australia's small set of comparator firms by partially incorporating international firms. The Panel recommends that the ERA more fully develop and explain their sample selection approach in the next Instrument because the choice of comparator firms is arguably the most impactful single decision influencing the final return

- In Section 11.5.2, the ERA has considered making an allowance for liquidity facilities costs in the debt raising costs and decided against it. The Panel recommends that the treatment of liquidity facilities costs is further considered in future instrument reviews.

- In Section 13.2, the Panel finds that the ERA has made reasonable assumptions on Gamma, but the Panel notes that they rely on the assumption that the benchmark firm would share key characteristics with the ASX 50. Whether that assumption is correct is open to debate, so the Panel recommends the ERA consider resolving this in future Instruments by answering the following questions:
    - Does the distribution rate differ significantly between ASX50 and non-ASX50 firms?
    - If so, is the benchmark firm an ASX50 firm?

3. THE INSTRUMENT

The Panel has some brief comments to make in relation to the ERA's draft Instrument. These comments go to the replication of the ERA's estimate by stakeholders, and minor comments on mandatory requirements of an Instrument, and excision of explanatory material.

Overall, the Panel is of the view that the Instrument clearly does its job of describing a way by which to calculate a rate of return on capital. Whilst a separation between the Instrument and explanatory material is clearly contemplated under the legislative scheme, the introduction of contextual material is useful to explain the 'what' rather than the 'why' of the ERA's decision.

3.1 Replicability

The ERA has asked the Panel to include in its report whether, in the panel's view, the method set out in the draft gas Instrument will allow stakeholders to replicate the ERA's estimate at a point in time.

The Panel's view is that the method set out in the draft gas Instrument is replicable. It sets out its reasons for that conclusion below.

3.1.1 Weighted Average Cost of Capital

The Instrument uses a nominal vanilla weighted average cost of capital (WACC), which is well established and widely used in practice. It is as described in Equation 1 below:

$$WACC = E(r_e)\frac{E}{V} + E(r_d)\frac{D}{V} \qquad \text{(Equation 1)}$$

Where:

- WACC is the weighted average cost of capital
- E(r_e) is the expected return on equity
- E(r_d) is the expected return on debt
- E/V is the proportion of equity in total financing (comprising debt and equity)
- D/V is the proportion of debt in total financing (comprising debt and equity)

The Instrument seeks to explain how each of the components of the WACC are to be estimated. The panel considers that it is effective in doing so, and that the Instrument could be applied successfully without the Explanatory Notes.

This section summarises how the Instrument would be applied in practice.

3.1.2 Weighting

D/V is fixed in the Instrument, at 55 per cent

As E/V plus D/V must equal 1, E/V is fixed at 45 per cent

3.1.3 Return on equity

E(r_e), the expected return required on equity, is estimated using the CAPM, a well understood and widely applied asset pricing model, defined by Equation 2, below:

$$E(r_e)_i = R_f + \beta_i\big(E(R_m) - R_f\big) \qquad \text{(Equation 2)}$$

Where:

- $E(r_e)_i$ is the expected return on equity of firm *i*
- R_f is the risk-free rate
- β_i is the equity beta of firm *i*
- $E(R_m)$-R_f is the market risk premium (MRP), calculated as $E(R_m)$ (the expected return on the market portfolio) minus R_f (the risk-free rate)

Risk-free rate

The Instrument uses a 10-year Commonwealth Government bond to obtain the risk-free rate for the return on equity. This rate will be fixed for the duration of the regulatory period and estimated by applying linear interpolation to the observed yields from 10-year Commonwealth Government bonds. The period during which R_f is estimated is sufficiently outlined in Chapter 3 of the Instrument.

Market risk premium

Is defined in the Instrument as 6.2 per cent.

Equity beta

Is defined in the Instrument as 0.7.

Comment on applicability

The Panel considers that the Return on Equity can be estimated reliably based on public information together with the explanation provided in the Instrument. Although significant explanatory information, including formulae, are included in the Explanatory Statement, the concepts are sufficiently well developed in the Instrument for it to be able to stand alone.

3.1.4 Return on debt

The Instrument uses a hybrid trailing average approach to estimate the return on debt and defines the return on debt as comprising a risk premium above the risk-free rate, plus an additional margin for administrative and hedging cost, per Equation 3 below:

$$R_d = Risk\ free\ rate + Debt\ risk\ premium + Debt\ raising\ costs + Hedging\ cost \qquad \text{(Equation 3)}$$

Under the hybrid trailing methodology, the entity is assumed to enter into a portfolio of 10-year fixed-rate debt with 10 per cent refinanced each year. Derivative arrangements are assumed to be used to adjust rates from the efficient debt portfolio to lock in five-year interest rate swaps rates, set on the day at the start of the regulatory period. Each year the 10-year trailing average debt risk premium is updated to add the most recent year and remove the estimate from 10 years prior.

Risk free rate

The estimate of the risk-free rate is based on the observed yield of a five-year interest rate swap rate, averaged over a 20-day period just prior to the regulatory period, as outlined in Chapter 3 of the Instrument. The data is available from Bloomberg and other similar data providers.

Debt risk premium

The on-the-day debt risk premium will be derived from the yield of an observed sample of bonds issued by comparator firms with similar credit ratings as the benchmark efficient entity. The ERA calculates the debt risk premium based on a 10-year trailing average, which will be updated annually. The Panel considers that the Instrument clearly defines the six steps required to calculate the debt risk premium at a point in time, being:

1. Determining the benchmark sample: The Instrument described the filters used to filter data on Bloomberg and is objective and replicable.
2. Collecting data and converting yields to Australian dollar equivalents: The Instrument explains the approach taken to estimate the "spread to swap" for each bond.
3. Averaging yields over the averaging period: Calculating an average AUD equivalent bond yield for each bond across the averaging period
4. Estimating curves: The Instrument uses three models, the Gaussian Kernel, Nelson-Siegel and Nelson-Siegel-Svensson techniques; all are well understood.
5. Estimating the cost of debt: The simple average of the three yield curves' 10-year costs of debt is used to arrive at a market estimate of the 10-year cost of debt.
6. Calculating the debt risk premium: The debt risk premium is estimated by subtracting the 10-year interest rate swap rate from the 10-year cost of debt.

Debt raising and hedging costs

The debt raising and hedging costs are defined in the Instrument as 0.165 per cent pa and 0.123 per cent pa, respectively.

3.2 Instrument requirements

Section 30C of the NGL, which is not referred to in the draft Instrument or ES establishes that the Instrument is binding on both the ERA and gas service providers.

Section 30E of the NGL (referred to at Paragraph 13 of the Draft Instrument) specifies the required content of an Instrument including:

(1) If a rate of return Instrument states a way to calculate the rate of return on capital or the value of imputation credits, the Instrument must—
   (a) provide for the same methodology to apply in relation to all covered pipeline service providers in calculating the rate or value; and
   (b) provide for the methodology to apply automatically without the exercise of any discretion by the [ERA]

Paragraph 14 of the draft Instrument seeks to address the requirements contained in 30E(2)(a) and (b) of the NGL. It may do so. It states 'When finalised, the gas Instrument is a binding Instrument on the ERA and gas network service providers. The binding gas Instrument will set out how the rate of return is automatically applied in each regulatory determination, without the exercise of any discretion.'

On one reading, it may be that the Instrument does not unequivocally provide for the same methodology to apply in relation to all covered pipeline service providers. For the avoidance of doubt, the Panel suggests that the ERA refer to Section 30C of the NGL and make specific provisions within the Instrument that mirror the exact wording of Sections 30E(2)(a) and (b) of the NGL in its final decision.

3.3 Excision of explanatory material

The ERA generally does a good job of including only contextual rather than explanatory material in the draft Instrument. We have noted only one example where material is explanatory.

At Paras 56-7 of the draft Instrument, the ERA sets out the formula for calculating the subsequent annual adjustment to the initial revenue path for a change in the estimate of the debt risk premium. Under this formula, all return on debt amounts remain unchanged from those provided in the initial revenue path in the final access arrangement decision, except for the annual allowance, which reflects the change in the debt risk premium in the regulatory years two to five.

Para 59 contains the following material 'As only the estimate of the debt risk premium is updated annually, the approach constitutes a partial update of the return on debt and the rate of return. This partial update is the approach that best meets the requirements of the National Gas Law, the national gas objective, the revenue and pricing principles and the National Gas Rules since it takes both efficiency and the desire of users for stability in gas pipeline tariffs into account.'

The second sentence of that paragraph is clearly explanatory. Curiously, it is also the only reference to the ERA accepting the desire of users for stability in tariffs as relevant to determining an approach that best meets the requirement of the NGL.

The material should be included in the ES rather than the final instrument

4. THE REGULATORY FRAMEWORK

4.1 Description

The title of and introduction to this Chapter suggests that its content will be largely descriptive, setting out the requirements of the NGL and the NGR as they pertain to monopoly gas infrastructure and the 2022 Gas Instrument Review. (Paras 33 and 34). The first part of the chapter does just that, setting out many of the relevant provisions and making some useful interpretative commentary, such as the NGO being intended to promote economic efficiency (Para 41) and the pricing principles in the NGL being consistent with an incentive regulation approach.

The Chapter however does more than its title suggests. As well as a description of the National Gas Objective, the revenue and pricing principles under the National Gas Law and the National Gas Law, and how the rate of return is applied when determining allowed revenues under the National Gas Rules, the ERA is determinative in this chapter, making several findings on overall approach.

It describes the interaction between economic efficiency and long term consumer interests, albeit in a way that could be enhanced (Paras 41 and 54).

It determines to use a benchmark efficient entity (Paras 52-4) and defines it as a pure-play network service provider operating within Australia, with a similar degree of risk. (Para 57) (unchanged).

It discusses the necessary exercise of regulatory discretion given the need for estimation and establishes principles for its use. (Paras 64-73)

It discusses the impact of the regulatory framework on risk. (Paras 80-92).

The only submission cited in the chapter is the CRG on the principles for exercising regulatory discretion (Para 74).

The Panel also draws attention to the ERA's noting of the CRG's major argument in Chapter 5 that there is a need to consider the extent to which the regulatory arrangements themselves affect the assumptions of the WACC method and its parameters despite recognising that the nominal vanilla WACC as used by the ERA and other Australian regulators is a relevant default starting point method for setting an allowed rate of return (Para 105). The submission is relevant to sections of Chapter 4 devoted to principles and risk and our making some suggestions in relation to the CRG submission later in this Chapter.

4.2 Panel Assessment

4.2.1 Description of legislative underpinning

The descriptive part of the Chapter is straightforward and orthodox in so far as it goes.

The Panel makes several relatively minor suggestions in relation to this part of the Chapter.

Firstly, the Panel believes that the discussion of the NGO and efficiency would be aided by some additional commentary by the ERA on key concepts in the objective. Paragraph 41 would be improved by reference to the well settled finding of the Federal Court in the 2017 AER vs ACT case[1].

'The provisions proceed on the legislative premise that their long term interests are served through the promotion of efficient investments in, and efficient operation and use of gas services. The promotion is to be done 'for' the long term interests of consumers. It does not involve a balance as between efficient investment, operation and use on the one hand and the long term interests on the other. Rather, the necessary legislative premise is that the long term interest will be served by regulation that advances economic efficiency.'

While that paragraph is key to the ERA's decision making, we think that the ES would be enhanced by further short discussion of the trade-off between consumer's short term and long term interests, and how the ERA's decision promotes the efficient production and use of gas services as well as the efficient investment in those services. The ERA would be aware that both the ERA's and the AER's CRG have raised the regulators' obligation to equally consider efficient investment and efficient consumption (CRG Paper 15 March 2022, Section 3), but this is not seemingly directly addressed in the ES.

Secondly, at Paragraph 35, and again at Paragraph 41, the ERA sets out parts of Section 30D of the NGL, the primary enabling provision in relation to the making of a rate of return Instrument. The first half of the Section appears to place an absolute obligation on the ERA. Provided a rate of return on capital or the value of imputation credits is required for performing or exercising an ERA economic regulatory function or power, the ERA must make an Instrument.

The Instrument review provisions contained in Section 30P of the NGL, referred to at Paragraph 5 of the Introduction to the ES, but not in Chapter 4 are cast in similar seemingly absolute terms. If there is an Instrument in place, the ERA must review and replace it.

The ERA seems to implicitly form the view, correctly in the Panel's view, that both obligations are subject to a judgement on the ERA's part that it cannot make an Instrument without being satisfied the Instrument will, or is most likely to, contribute to the achievement of the national gas objective to the greatest degree.

[1] Australian Energy Regulator v Australian Competition Tribunal (No 2) [2017] FCAFC 79 (24 May 2017), Paragraphs 491- 496.

The Panel has already made several observations in its Overall Assessment in Chapter 2 on the need for additional material in the ES to make clear both of what the ERA is satisfied, and why it is so satisfied.

For the purposes of this Chapter, it suggests the ERA should make more explicit its view of the interaction of the provisions described above.

It should also replace the words 'have regard to' in Paragraph 39. Clearly, the ERA is required to do more than have regard to the NGO.

Thirdly, at Paragraph 36, the ERA recites Section 30E, which sets out the requirements for the content of an Instrument. Its introductory comment accurately reflects the Instrument may include other matters the ERA considers appropriate. It does not however also refer to the mandatory provisions in relation to the content of an Instrument that we discuss in Chapter 3. It should do so.

Finally, at Paragraphs 37 and 38, the ERA recite the publication requirement for the Instrument and explanatory information. The ERA however neither recites nor seems to have had direct regard to the inclusive statutory definition of 'explanatory information' contained in Section 30A of the NGL. We have set out that definition in full below. We have also set out for completeness Section 30G, referred to in Section 30A.

explanatory information, for a rate of return Instrument, means information about the content of the Instrument, including (but not limited to) information explaining—

> (a) the reasons for the rate of return on capital or the value of imputation credits under the Instrument; and
>
> (b) how the stated value, or the way to calculate the rate or value, was decided; and
>
> (c) if the Instrument replaces another Instrument—
>
> > (i) the differences (if any) between the Instrument and the replaced Instrument; and
> >
> > (ii) the reasons for any differences; and
>
> (d) why the ERA is satisfied the Instrument will, or is most likely to, contribute to the achievement of the national gas objective to the greatest degree; and
>
> (e) how the ERA had regard to the following in making the Instrument:
>
> > (i) the revenue and pricing principles;
> >
> > (ii) the matters mentioned in section 30G;
> >
> > (iii) estimation methods, financial models, market data and other evidence relevant to making the Instrument;
> >
> > (iv) prevailing conditions in the market for equity funds;
> >
> > (v) the interrelationships between financial parameters used, or to be used, in relation to deciding the rate or value.

30G—Other matters ERA must have regard to in making Instrument

In making a rate of return Instrument, the ERA must also have regard to the following—

(a) advice, recommendations or submissions given by a consumer reference group;

(b) submissions made, and the report published, under section 30H;

(c) submissions made under section 30J;

(d) the report given by the independent panel under section 30K

Somewhat surprisingly to the Panel, the explanatory information definition is not referred in either the Draft Instrument or the ES, nor has the ERA seemingly structured the ES with the 'explanatory information' definition at the front of its mind. Whilst there are references to various evidentiary material throughout the ES, there is no single place in the material, such as the Executive Summary of the ES, where the ERA summarises its evidentiary basis or goes beyond general statements such as the one in Paragraph 12 of the Draft Instrument. In that paragraph, the ERA indicates that its reasoning considers a range of evidence including academic literature, market data and developments, submissions during the review, expert views and other relevant information.

The Panel recommends that the Panel include the definition of explanatory information in Paragraph 38 and satisfies itself that the ES contains information explaining each of the matters listed in the definition. The ERA may wish to structure its ES in future more closely to the statutory publication requirement.

4.2.2 Determination of benchmark entity, discussion of regulatory discretion, secondary principles and risk

The determinative paragraphs in relation to the use of a benchmark entity are relatively straightforward.

The Panel notes the ERA's discussion on the selection of appropriate secondary principles after an appropriate discussion of regulatory discretion. The Panel generally accepts the reasoning of the ERA for excluding the additional principles suggested by the CRG, including a proposed principle that the ERA consider how the rate of return methodology in conjunction with other aspects of the regulatory arrangements are likely to impact on risk, return and the realisation of the economic efficiency criteria.

The Panel has already suggested the ERA consider being more explicit in how it interprets 'efficient use' in the NGO. It certainly thinks 'having regard to the national gas objective and revenue and pricing principles when making the rate of return Instrument, the ERA considers that it will ensure efficient use of the gas pipelines it regulates. (Para 76), which is the reason given for the exclusion of the proposed principle requires reconsideration. It essentially suggests that having regard to an objective which includes the efficient use of infrastructure will ensure the efficient use of the infrastructure. That cannot be what the ERA intended.

The Panel has already made a recommendation in relation to the use of secondary principles in its Overall Assessment in Chapter 2.

The Panel notes the ERA's discussion of risk, much of which is unexceptional, and the central conclusion of that discussion, which seems to be that the ERA considers that it is the monopoly status of a regulated business that increases the certainty of the revenue stream, not necessarily regulation (Para 84). The Panel accepts that proposition. If the discussion on risk was in part informed by or in response to the CRG submission referred to below, it should be referenced in the discussion.

4.3 More extensive consideration of CRG submission

The Panel does however believe there is a need for the ERA to explain how it has engaged fulsomely with the CRG's argument that there is a need to consider the extent to which the regulatory arrangements themselves affect the assumptions of the WACC method and its parameters. The ERA's consideration of the submission is limited to a single sentence that the ERA establishes the gas rate of return to reflect the risk of a regulated gas network. (Para 116). What seems to be in contention however is how that risk is determined rather than whether it is the risk of a regulated gas network as opposed to an entity facing competition.

That response does not engage with several propositions advanced by the CRG. To illustrate this, we have set out in some further detail an extract from Page 39 of the CRG's submission

The determination of the allowed rate of return is one key feature of the regulatory arrangements but the form of those arrangements in terms of allowances for capital and operating expenditure and depreciation and whether or not a revenue cap or a strict price cap applies are likely to impact on risk and the parameters allowed for in the WACC.

Issues for consideration are the extent to which the circumstances facing regulated firms, including the regulatory arrangements, may impact on the assumptions and how different aspects of the regulatory arrangements may address concerns about the assumptions and impact on the choice of appropriate parameters in the methodology for determining the rate of return.

A particular issue of concern to large consumers is the extent to which the regulatory arrangements provide a degree of profit protection to the regulated entities that is not feasible for large consumers with substantial sunk costs.

The main issue for the long term interests of consumers in general, given the NGO as defined, is in ensuring that the allowed rate of return does not entail excess profits and does not provide more compensation for risk than is necessary to ensure efficient investment occurs.

A subsequent paragraph raises the period of recovery of sunk costs in a period of uncertainty.

The raising of the need for more fulsome consideration of the CRG submission should not be seen as a tacit endorsement by the Panel of that submission. It is not clear how, if at all, difficulties large consumers may have in recovering sunk costs in a period of uncertainty would be relevant to the estimation of a regulated rate of return. Equally, it is not clear given the tools available to the ERA that any uncertainty to which the CRG refers would necessarily be reflected in a degree of continuing regulatory protection for their assets.

These however are ultimately matters for the ERA to consider and respond to. The Panel's concern is that the ERA needs to be clear in its response in the ES that it has appropriately taken into account the principal submission of the CRG.

5. THE RATE OF RETURN FRAMEWORK

5.1 Description

The rate of return framework sets outs the foundational approach that ERA will apply when setting the rate of return.

The Instrument applies a nominal vanilla WACC to develop the return. The WACC methodology is widely used in practice because it is theoretically sound, straightforward, can be intuitively explained, and can be replicated. Its use in the Instrument also has the merit of regulatory stability, having been used in the 2018 Instrument and other regulatory models across Australia.

The Panel notes that the submissions received during the consultation process were generally supportive of the approach.

5.2 Panel Assessment

The Panel considers that the ERA's proposed rate of return framework is appropriate and based on sound reasoning.

6. CROSS-CHECKS

6.1 Description

Cross-checks are additional information sources used to compare and evaluate the reasonableness of the rate or return generated from the rate of return framework. The appeal of cross-checks is in their potential to ensure that the formulaic approach to the rate of return doesn't produce an unrealistic or uneconomic outcome. The ERA considered several cross-checks, including Financeability, Regulatory Asset Base (RAB) multiples, and historic profitability.

Financeability refers to the ability of an entity to meet its financing requirements. It may be useful as a cross check for regulatory pricing purposes to determine whether a pricing mechanism results in a benchmark entity being unable to generate cashflows to maintain the assumed credit rating or otherwise be financially sustainable.

Regulatory Asset Base (RAB) multiples are the enterprise value of a given entity divided by the value of its regulated asset base. RAB multiples may be useful for regulatory pricing purposes because they approximate the NPV=0 principle when equal to 1. In other words, with a RAB multiple of 1, at the current market value of the firm, investors are compensated exactly at a level to encourage efficient investment.

Historic profitability is a backwards looking measure of the reasonableness of a pricing mechanism, by considering the accounting profit of a regulated entity, relying on the principle that regulated firms should realise a positive but not excessive amount of profit.

The draft Instrument has determined to not use cross-checks.

6.2 Panel Assessment

The Panel notes that several submissions were made during the consultation process that were supportive of the use of cross-checks, citing benefits such as their ability to allow regulators to incorporate a wider set of information and their utility as 'sense checks'. Furthermore, cross-checks are used by other regulators in Australia and internationally.

The panel considers that the ERA's proposal to not use cross-checks is appropriate and based on sound reasoning. Incorporating less defensible competing models into the return setting process as cross-checks risks reducing the overall effectiveness of the Instrument because application of cross-checks is either subjective and non-transparent, or transparent and prone to gaming.

At the core of the challenge with cross-checks is the difficulty in decomposing the proposed metrics to determine the extent to which they have been impacted by the rate of return Instrument. The Panel notes that the AER is seeking to address this issue by investigating ways to decompose RAB multiples to gain better insight into whether its rate of return instrument sets returns too high or too low. This work, if successful, may enhance the utility of RAB multiples but, at present, the Panel considers that the ERA's proposal to not use cross-checks is appropriate and based on sound reasoning.

The following section explains the Panel's reasoning regarding each of the cross-checks considered in the Instrument.

6.2.1 Financeability

The rate of return Instrument is just one of many possible determinants of financeability issues. In practice, a network business will make financial and operational decisions that differ from what the 'benchmark efficient firm' would. When implemented successfully, the network business generates additional returns to shareholders; when such decisions are less successful, financeability may be impaired.

Adjusting the Instrument to compensate for the impact of discretionary decisions risks either being untransparent or prone to gaming.

6.2.2 Regulatory asset base multiples

Regulated asset base multiples are the enterprise value of a firm divided by its regulatory asset base.

The Panel considers ERA's proposal to not use RAB multiples to be reasonable, given the complexity in decomposing the myriad drivers of a network operator's enterprise value.

Investor expectations are not uniform, and the enterprise value of a firm reflects these competing views which may include for example, expectations of superior operational performance, future net present value growth, and embedded real options (for example, the option to expand or adjust in the face of changing dynamics).

Notwithstanding the efforts of the AER that are noted above, the Panel considers that decomposing RAB multiples to exclude these other factors would require many assumptions and be likely to be prone to more error than the framework used in the Instrument.

6.2.3 Historic profitability

Historic profitability suffers from many of the same weaknesses identified for financeability and regulatory asset base multiples. As with the preceding cross-checks, many firm-specific factors drive actual performance and any attempt to decompose performance to isolate the factors that would have applied to a benchmark firm require numerous assumptions and would be prone to error. Furthermore, any formal consideration of historic performance risks leading to regulated entities to game the outcome by engaging in earnings management.

7. AVERAGING PERIOD PROCESS

7.1 Description

In setting the rate of return, the ERA observes returns for assets as inputs into the return on debt, the return on equity, and expected inflation. An averaging period of 20 consecutive days is used, with this period nominated in advance by the regulated entity. The nominated period must fall within a window of at least three months, but no longer then seven months, before the relevant regulatory year.

This approach is largely unchanged from that used for the 2018 Instrument. The only change is that the averaging window is now between three and seven months, rather than between two and six months, prior to the regulatory year. The ERA suggests that this change is to allow more time for annual reference tariff variation calculations.

7.2 Panel Assessment

The Panel considered that averaging market observations over 20 days (effectively one trading month) is appropriate to smooth out volatility and the influence of extreme outliers. Using a relatively short averaging period ensures the observed rate is close to current market conditions, and it is unlikely that a longer period would have a significant impact.

The Panel understands that a number of stakeholders are involved in the tariff variation process. Receiving a response from all stakeholders and then cross-checking can take some time. Therefore, the change in the timing of the averaging window, to be at least three months from start of the regulatory year, seems appropriate. This change would only have an impact on the averaging process if there were a large degree of seasonality evident in Australian financial markets, and this does not seem to be the case.

Ensuring that the averaging period is nominated in advance ensures that the regulated entities are not able to use hindsight to cherry-pick the best outcome.

The Panel notes that submissions received during the consultation period were generally supportive of this approach.

On balance, the Panel considers that the ERA's proposed approach is appropriate and based on sound reasoning.

8. GEARING

8.1 Description

Gearing is the proportion of a firm's assets financed by debt and equity and is defined as the ratio of the value of debt to total capital. The NGL Section 30(D)(4) requires that "the way to calculate a rate of return on capital must include a weighted average of an allowed return on equity and an allowed return on debt."

To fulfil this requirement, the ERA uses the gearing ratio to appropriately weight the costs of debt and equity when computing the WACC. In addition, the gearing ratio is used as a factor in establishing an appropriate credit rating, to re-lever asset betas, and to determine interest and tax expenses.

For the 2022 Instrument, the ERA uses a fixed gearing level of 55 per cent. This approach is unchanged from that used for the 2018 Instrument.

8.2 Panel Assessment

The Panel notes that the proposed gearing level is below the benchmark level of 60 per cent used in prior Australian regulatory decisions (Para 224) and the ratio set in the AER's 2022 draft Instrument. However, it is consistent with the observed gearing levels stated in the AER's 2021 annual rate of return update (Para 227), as well as the ERA's own estimates (Para 261).

Whilst the theoretically correct approach is to use market values of debt and equity to calculate the gearing ratio, the ERA uses a hybrid approach whereby book values are used for debt and market values are used for equity. Since not all debt is marketable, and marketable corporate debt tends to be illiquid, the Panel believes that the use of book value is appropriate and notes that this is a commonly used proxy.

In recent years, a greater number of hybrid securities have been issued by regulated entities. The ERA has taken an approach whereby publicly available information is used to determine whether the securities have predominantly debt or equity characteristics. If the securities exhibit more equity characteristics, then they are removed from debt for the gearing calculation (Para 256). The Panel believes that this is a sensible approach and welcomes consideration of the AER's review of hybrid securities (Para 257).

The Panel notes that all submissions received in relation to gearing were sympathetic to the approach and supported the continued use of a benchmark gearing level of 55 per cent.

On balance, the Panel considers that the ERA's proposed approach is appropriate and based on sound reasoning.

9. RETURN ON DEBT

9.1.1 Method for estimating the return on debt

The return on debt represents the return that investors require to compensate them for the risk taken in providing debt financing.

For the 2022 Instrument, the ERA estimates the return on debt as the sum of the risk-free rate, a risk premium to compensate for the additional risk of investing in securities with default risk, and a margin for administrative and hedging costs (see Equation 3). This is estimated using the hybrid trailing average approach, with the 10-year trailing average updated annually. This approach is unchanged from that used for the 2018 Instrument.

The ERA provides detailed consideration of three different methods for estimating the return on debt – the on-the-day approach, the full trailing average approach, and the hybrid trailing average approach.

9.1.2 Panel Assessment

The Panel considers that the hybrid approach chosen offers a sensible compromise between the alternate approaches, minimising interest rate risk and refinancing risk. In addition, the hybrid trailing average approach satisfies the NPV=0 principle (Para 327).

The Panel observes that replication of the Instrument is aided by the explicit guidance provided for the implementation of the annual update (Sec 9.1.4.3). The Panel also notes that the hybrid trailing average approach has been in use since 2015 (Para 323) and that all submissions received were in favour of maintaining this approach which establishes regulatory stability.

9.2.1 Debt risk free rate

The risk-free rate is the rate of return an investor receives from holding an asset when there is no risk of default, and which compensates investors for the time value of money.

For the 2022 Instrument, the ERA uses the prevailing five-year interest rate swap rate as the risk-free rate on debt.

The interest rate swaps market is readily accessible and liquid and offers the most commonly method of hedging interest rate risk on corporate bonds. Unlike Government securities, observable interest rate swap rates are based on a constant maturity and so it is not necessary to interpolate between two different maturities to arrive at a five-year rate. This simplifies the calculation of the debt risk premium, and the Panel notes that this aids with the replicability of the Instrument.

9.2.2 Panel Assessment

The Panel notes that the five-year term for the debt risk free rate is consistent with the regulatory period. However, it differs from the 10-year term used for both the term of debt and

the risk-free rate used to calculate the return on equity, and for the hybrid trailing average. The intuition for this approach seems to relate to its importance for ensuring the NPV=0 principle is met and that it reduces the ability of regulated entities to exploit the, typically, upward sloping yield curve. The ERA explains (Para 321) "the use of a five-year risk-free rate ensures that a firm would not benefit from a higher margin allowed in a 10-year rate while at the same time entering into five-year debt contracts."

The Panel considers that this reasoning is credible.

However, the reasoning could be improved by a) providing a more detailed explanation as to how firms would go about exploiting the slope of the yield curve, and b) clarification as to why it is reasonable for the (five-year) term to differ from that used elsewhere (10-year).

The latter point goes to one of the Panel's overarching concerns regarding consistency in implementation of the NPV=0 principle, that is whether it is prudent to apply unequal terms for different inputs into the rate of return determination.

In other words, the ERA does not offer a clear explanation as to whether it is possible to maintain the NPV=0 principle when model inputs have different terms.

9.3.1 Term of debt

For the 2022 Instrument, the ERA assumes a portfolio of 10-year fixed-rate debt with 10 per cent refinanced each year. This approach is unchanged from that used for the 2018 Instrument.

9.3.2 Panel Assessment

All submissions received in relation to the term of debt supported this approach.

The Panel notes that this approach is consistent with standard Australian regulatory practice (Para 372) and there is evidence that it aligns with the debt term targeted by gas pipelines (Paras 378 & 380). The ERA provides appropriate reasoning to maintaining this approach and it seems reasonable.

9.4.1 Benchmark credit rating

Credit ratings provide a measure of default risk that is used to estimate the debt risk premium in excess of the risk-free rate. A lower (higher) credit rating is associated with a higher (lower) risk of default and a higher (lower) debt risk premium.

For the 2022 Instrument, the ERA assumes a benchmark credit rating of BBB+. This approach is unchanged from that used for the 2018 Instrument.

The ERA estimates this benchmark based on a sample of credit ratings for Australian energy networks (Para 407).

9.4.2 Panel Assessment

While the benchmark credit rating is stable over the period 2017-2020, the Panel notes that two of the three entities suffered a rating downgrade in 2021. Owing to macroeconomic factors, ratings downgrades may suffer from serial correlation, with one downgrade following another over the business cycle. Should this transpire, the median credit rating would fall below the ERA's benchmark, and so the debt risk premium would be underestimated.

However, as a counterpoint, the Panel notes that the median credit rating in the AER's 2021 annual rate of return update increased from BBB+ to A-. In addition, the ERA provides guidance (Para 420) that the efficient benchmark need not "reflect the actual financial characteristics of a service provider…..should reflect attainable and efficient means of financing to deliver the reference services." Therefore, on balance, it seems reasonable to anticipate stability in the credit rating for this regulatory period, and submissions received were largely supportive of this.

The number of benchmark sample firms has declined over time. The Panel feels it is important that the ERA consider how this will impact the determination of the benchmark credit rating in future regulatory cycles.

The ERA provides some guidance on a similar issue in relation to the equity beta (Sec 10.4.5.3) and could provide an explanation as to whether similar methods could also be considered for debt estimates.

In relation to this issue, there is the matter of consistency as to why it is imperative to focus on Australian risk for debt markets, but international (non-domestic) risk is considered adequate for equity markets. Since discount rates are related to risk, the selection of financial Instruments that have risk centred in different markets may have the unintended consequence of producing NPV not equal to zero, violating the NPV=0 approach.

9.5.1 Debt risk premium

The debt risk premium provides compensation for the bearing of default risk by investors, it is the return in excess of the risk-free rate that is required to entice investors to lend to a benchmark entity.

For the 2022 Instrument, the ERA uses the revised bond yield approach to determine the debt risk premium. This approach is unchanged from that used for the 2018 Instrument, and all submissions received were supportive of the continuation of this approach.

The revised bond yield approach involves multiple steps – determining the benchmark sample, collecting and converting data, averaging yields over the averaging period, estimating curves, estimating the cost of debt, and then calculating the debt risk premium.

In this case, the benchmark sample uses both international and domestic bonds which share a set of characteristics and must have Australia specified as the country of risk.

9.5.2 Panel Assessment

While the term of debt is assumed to be 10-years, bonds need only have a time to maturity of two years or longer to be included in the benchmark sample. Including securities that have a much shorter maturity is potentially problematic.

On the one hand, firms issuing shorter-term debt may in truth face higher default risk owing to the roll-over of debt. On the other hand, the academic literature shows that, in the presence of information asymmetry, debt maturity is influenced by the true credit quality of the issuer, with poor-quality firms issuing long-term debt to avoid roll over risk. In other words, debt with two-year maturity may not necessarily have the same default risk as a 10-year bond with the same credit rating. Curve fitting techniques, such as the Gaussian Kernel method, only partially address this issue by placing less weight on bonds with maturity further away from the target tenor.

The Panel suggests the ERA should provide some explanation around this issue and consider increasing the minimum maturity to five years, provided sufficient bonds remain in the benchmark sample. A minimum maturity of five years would align with the ERA's contingency approach to data issues (Para 513) which stipulates that a contingency is triggered when there are "less than 10 bonds between the maturities of five and 15 years."

Another characteristic required for inclusion in the benchmark sample is that the credit rating of each bond must match that of the benchmark entity. Implicit in this requirement is that default risk is consistent across bonds with the same credit rating. Although this fits with the intended purpose of credit ratings there is some empirical evidence that ratings are not comparable across asset classes.

The Panel suggests that, in the future, it would be prudent for the ERA to consider the provision of more restrictive guidelines regarding the characteristics of bonds entering the benchmark sample.

The ERA uses a simple average of three different curve fitting techniques to estimate the cost of debt – the Gaussian Kernel method, the Nelson-Siegel method, and the Nelson-Siegel-Svensson method. Since each of the techniques offers particular advantages (and disadvantages) it seems reasonable to create an average measure, although this implies the ERA believes each technique is equally informative. Whilst the Panel does not have a preferred method, it notes that this step of the calculation would be simplified if a single preferred method were identified.

The Panel notes that the ERA has considered potential issues in relation to data availability (Para 513) and that the contingency planning provided seems reasonable in the event of unavailable data.

Overall, the Panel considers the approach to calculating the debt risk premium to be transparent and replicable. Although the process involves some more advanced calculations, particular in relation to the curve fitting techniques, they can easily be updated once those models are established in a spreadsheet.

10. RETURN ON EQUITY

10.1.1 Return on equity model

The Instrument uses the Sharpe-Lintner Capital Asset Pricing Model (CAPM) to estimate the return on equity, consistent with the 2018 Instrument and the AER. The CAPM is described in Equation 2.

In contrast to the 2018 Instrument which used a 5-year term, the draft Instrument uses a 10-year term for the cost of equity. The ERA justifies this change on the basis that 10-years better reflects the life of regulated assets (whereas the 5-year term matches the regulatory period).

10.1.2 Panel Assessment

The Panel notes that the CAPM is increasingly being superseded in academia, and the investment industry to a lesser degree, as other models are found to better explain realised returns. Nevertheless, the CAPM is appealing for regulatory purposes – it is theoretically sound, transparent, replicable, and relatively intuitive. These characteristics explain why it is still the most widely used asset pricing model among corporate financial decision makers and regulators. The Panel notes that submissions were supportive of the use of the CAPM.

The Panel considers that the ERA's proposal to use the Sharpe-Linter CAPM is appropriate and based on sound reasoning.

The remainder of this section considers the merits of the 10-year term, and the approach to estimating the inputs to the CAPM.

10.2.1 Term of equity

The term that regulators use to estimate the cost of equity is an ongoing matter of contention. Stakeholders and regulators hold different, and evolving, views. For example, the AER's proposed new Instrument moves to 5 years from 10 years, the opposite change to that proposed by ERA.

The Panel acknowledges that reasonable arguments can be made for either 5 or 10 years (or, indeed, other periods) and that the AER's decision was not available at the time the ERA drafted their Instrument. It further notes that submissions expressed various views, some preferring 5 years and others preferring 10 years.

10.2.2 Panel Assessment

The various submissions received throughout the consultation period, and those received by the AER in their contemporaneous review, made arguments variously for 5- or 10-year terms.

10-year estimation periods are arguably more consistent with standard finance practice of applying a discount rate with a term equal to the period of the cashflows being discounted. The submissions made to the AER in their rate of return 2022 development support the notion that

10 years is a better approximation of the horizons used by investors than the five-year regulatory period. However, investment horizons are unobservable, so this contention remains open to debate.

On the other hand, Dr Lally makes the case that a five-year term better achieves the NPV=0 principle. Several weaknesses of this logic, and Dr Lally's proof which seeks to support it, have been identified. In the absence of a stronger rebuttal of Dr Lally's proof, or a competing proof supporting the notion that a ten-year term can achieve NPV=0, the finding that 5-year terms better achieve NPV=0 also remains open to debate.

In general, the tendency for the interest rate term structure to be upward sloping means that increasing the term to 10 years will lead to a relatively higher risk-free rate input for the return on equity. The Panel acknowledges that this increase will be partially offset by a relatively lower MRP of which the risk-free rate is a component (i.e., $E(R_M) - R_f$).

The Panel notes that, in the presence of uncertainty, reasonable people can draw different conclusions from the same arguments. On balance, the Panel considers that the ERA's proposal to use a ten-year term is appropriate and based on sound reasoning.

10.3.1 Risk-free rate

The ERA uses a nominal vanilla rate of return under the national gas framework and therefore a nominal risk-free rate. A Commonwealth Government bond, with a maturity of 10-years to match the term of equity, is used as the proxy for the risk-free rate.

All submissions were generally supportive of the proposed approach.

10.3.2 Panel Assessment

The Panel considers that the ERA's approach to measuring the risk-free rate is appropriate and based on sound reasoning.

10.4.1 Market risk premium

The MRP is the expected rate of return for a fully diversified portfolio in excess of the risk-free rate. The ERA proposes using a method similar to, but simpler than, that used for the 2018 Instrument. The key changes proposed are:

- Only considering market risk premia post-1958 given the data quality issues and representativeness of returns of the 1883-1958 period.
- Including an additional subperiod (2000 onwards).
- Solely relying on the Brailsford, Handley and Maheswaran (BHM) dataset.
- A final historic market risk premium estimate where the average of arithmetic and geometric means of all subperiods is taken, where those global means are averaged to provide the point estimate.

ERA proposed to continue the practice of fixing the market risk premium for the period of the Instrument.

10.4.2 Panel Assessment

The Panel considers that ERA's approach to estimating the market risk premium is appropriate and based on sound reasoning.

The remainder of this section outlines the key considerations in coming to this conclusion, including consideration of historic periods and datasets used, averaging processes applied, the estimation and use of the dividend growth model (DGM) and the utilisation of conditioning variables.

10.4.3 Historic periods

The 2018 Instrument used five overlapping time periods (1883-2017, 1937-2017, 1958-2017, 1980-2017 and 1988-2017). In the draft 2022 Instrument, the ERA proposes dropping data prior to 1959 and adding an additional subperiod (2000 onwards).

The Panel notes that the choice of periods offered some contention among received submissions. While removing the pre-1958 period was supported, the inclusion of a post-2000 period created debate.

The Panel considers that the removal of data up to 1958 is appropriate, given the valid concerns regarding data quality prior to that date.

The Panel also considers the addition of a post-2000 dataset to be appropriate– it is plausible that the introduction of the GST and the end of the tech boom may represent a structural change in the Australian economy.

Finally, the elimination of the oldest data implicitly places greater weight on recent data that is more relevant to current market conditions.

10.4.4 Datasets

The ERA previously utilised the BHM and NERA Economic Consultancy datasets. The draft 2022 Instrument only uses the BHM data.

The Panel considers the sole use of the BHM data to be appropriate and based on sound reasoning; there is very little difference between the data, particularly in recent years.

10.4.5 Averaging

There are arguments to be made in favour of both the simple and geometric average approaches; the relative strength of these arguments largely depends on debatable assumptions about the underlying distribution of returns. The choice of method has economic implications;

the use of a simple average will bias returns upwards, whereas the geometric average will bias downward.

In the 2018 Instrument, the ERA sought to minimise error associated with over-reliance on one of the two types of averages by using a 50/50 weighting of the lowest arithmetic mean and highest geometric mean.

In the draft 2022 Instrument, two major changes have occurred to the weighting approach: Firstly, the historic market risk premium estimation no longer relies on two points (lowest arithmetic mean and highest geometric mean). The ERA instead now incorporates all the data periods to calculate an arithmetic mean and a geometric mean. Secondly, the ERA is proposing a 60/40 weighting (in favour of arithmetic mean), versus the previous 50/50 split.

The Panel considers that both changes are reasonable. A weighting in favour of the arithmetic mean is justifiable based on the mathematical principles on which the two methods are built and the purpose of the Instrument being to estimate the probability weighted average future return (which is better achieved with the arithmetic mean). The use of all sampling periods makes better use of the multiple periods than the previous method, which may have been excessively influenced by one subperiod.

Notwithstanding the above, the Panel once again highlight the risk of changes in the absence of strong empirical or theoretical support. The estimated market risk premium, and therefore the final rate of return, is very sensitive to these changes.

The method outlined in the Instrument produces an MRP estimate of 6.02 per cent (rounded to 6.0 per cent), changing one or more of these assumptions would result in estimate as low as 5.8 per cent (rounding to nearest ten basis points), and moving to a 70/30 average (not proposed, but potentially defensible), would result in a MRP estimate of up to 6.2 per cent. With an equity beta of 0.7, this is an economically significant range of 28 basis points.

Table 1: Sensitivity of MRP to Averaging Assumptions

Weighting	**50/50**	**60/40**	**High/Low**	**70/30**
Remove 2000-2021	5.767	5.957	5.830	6.150
Four sub-samples	5.843	6.024	5.925	6.205
50/50 is equal weighting of geometric and arithmetic mean, 60/40 is the method proposed by the ERA, High/Low is the simple average of the highest geometric mean and lowest arithmetic mean as applied previously by the ERA. 70/30 is another plausible blend included for demonstration purposes.				

10.4.6 Dividend Growth Model (DGM)

The ERA also utilised the dividend growth model (DGM) to obtain a forward-looking perspective on the MRP. The DGM is supported by a strong theoretical foundation and,

depending on how it is used, can be transparent and replicable. However, its forward-looking nature makes practical application difficult since the future growth rate in dividends in unobservable and must be estimated.

The submissions received in the consultation period reflected the difficulty in application; some suggesting a modified DGM approach, others suggesting a low weighting, and others still suggesting it was best used as a directional guide only.

The Panel considers the use of the DGM to be reasonable but note that it carries a high risk of error and upward bias.

The Panel recommends the ERA gives further consideration to appropriate use of the DGM when developing the next Instrument.

10.4.7 Conditioning variables

The ERA has considered the following conditioning variables by considering their levels relative to their historic averages and how these market conditions affect the market risk premium:

- *The AA bond five-year default spread*, which provides the spread between AA Australian Corporate Bloomberg Fair Value Curve and a Commonwealth Government bond.
- *The five-year interest rate swap spread*, which provides the spread between the interest rate swap rate and a Commonwealth Government bond.
- *Market dividend yields*, which provide the All-Ordinaries dividend yield as a ratio of dividends to the portfolio price.
- *Implied market volatility*, which is measured through the ASX 200 volatility index. considers the current levels of conditioning variables relative to their historic averages and how these market conditions affect the market risk premium.

The Panel considers the use of these conditioning variables to be reasonable when the ERA applies its regulatory discretion to determining the MRP.

Further, the Panel considers the ERA's conclusion that the current levels of these variables do not justify an adjustment to historic MRP estimates to be reasonable.

The Panel notes that the ERA is vague on the matter of precisely how these conditioning variables were applied. The Panel recommends the ERA more fully describes how insights from the conditioning variables were or could be incorporated into the Instrument.

10.4.8 Fixed or variable MRP

Stakeholders expressed diverging views on setting a variable market risk premium calculated at the commencement of each access arrangement. The ERA has considered multiple submissions and proposes to keep the MRP constant.

As the possible relationship between MRP and risk-free rate remains a contentious and unresolved issue, the Panel considers the ERAs use of a constant MRP to be appropriate and based on sound reasoning. Using a fixed MRP also simplifies implementation of the Instrument for regulated entities.

10.4.9 Point estimate of MRP

The ERA combines the historical average MRP, DGM, and its view on conditioning variables, together with its regulatory discretion to estimates a market risk premium of 6.2 per cent for the 2022 draft gas Instrument.

While noting that less reliance on the DGM would produce a figure closer to 6.0 per cent, the Panel considers that 6.2 per cent falls within a reasonable range.

10.5.1 Equity Beta

In the 2018 Instrument, the ERA estimated the equity beta using the All-Ordinaries Index and a sample of benchmark firms, applying a standard formula with a zero-debt beta to de-lever and re-lever the equity beta using the average gearing ratio of 55 per cent. The ERA's analysis at the time produced an equity beta of 0.7.

The major challenges facing the ERA as it seeks to estimate equity beta in the draft 2022 Instrument are that the sample of pure-play domestic comparators has reduced significantly (there is now only one ASX listed energy network), and that equity market volatility is high. This reduces the statistical robustness of estimates using a domestic-only sample. The presence of high volatility relative to that exhibited in gearing levels and credit ratings, explains why the ERA adopts a differing benchmark sample for estimation. It would be helpful if the ES made this link more specific.

The Panel considers the ERA's proposed equity beta estimation to be appropriate and based on sound reasoning.

The remainder of this section explains why this is the case, starting with the choice of sample firms and then moving to other implementation considerations.

10.5.2 Benchmark sample

The ERA has considered how the benchmark sample needs to evolve owing to current market developments that have resulted in a very small domestic sample. During considerations the ERA has evaluated options including:

- *Continuing to use a sample of Australian energy networks*: The very small sample of Australian listed energy networks has significant negative implications for the robustness of any estimates generated. Following the continued reduction in sample size, this problem is expected to worsen and so this approach is not sustainable.
- *Expanding the domestic sample to also include similar domestic infrastructure firms to energy networks*: Although this method potentially increases the sample size, it isn't clear that firms would share the same risk profile. Including such firms would be a departure from existing practice and may not be a long-term solution - the broader Australian listed infrastructure sector might be prone to the same consolidation and delisting experienced in the energy sector.
- *Expanding to an international sample*: Ultimately, the requirement for statistical robustness will require a sample of international comparator firms. This approach would be a departure from existing practice and precedent. In addition, there is currently insufficient understanding of the how estimates should be adjusted for international differences in market structure, regulation, and economic factors.

The ERA has taken a pragmatic approach to this challenge, including a sample of 58 firms covering Canada, New Zealand, US, and UK - countries which share language and have relatively similar market structures and legal frameworks to Australia.

The ERA proposes to determine a point estimate for equity beta for the Instrument as follows:

- Use domestic and international comparator firms.
- Consider five-year and 10-year data periods.
- Mechanically estimate equity beta using the method described above, including the use of OLS and LAD estimators.
- Pool beta estimates by country.
- Examines the distribution of equity betas, and
- Exercises regulatory discretion to determine the best point estimate.

The ERA ultimately applies an equity beta of 0.7 which will remain fixed for the life of the gas Instrument

The Panel notes the contention regarding the use of international sample firms. This is unsurprising given the economic significance of the decision and that reasonable arguments can be made in favour of and against their inclusion. Submissions that were supportive of international comparators were generally supportive of the proposed jurisdictions and firms.

The Panel considers that ERA's approach to incorporating international sample firms, as well as the country and entity selection, is appropriate and based on sound reasoning.

Nevertheless, the Panel suggests that ERA more fully develop and explain their selection approach in the next Instrument because the choice of comparator firms is arguably the most impactful single decision influencing the final return.

Table 2 provides a 'quick and dirty' illustration of the sensitivity of the beta to changes in the incorporation of international firms into the sample. This example demonstrates the impact of both the approach to weighting the international firms and the approach taken to average the betas.

Table 2 - Sensitivity of Equity Beta to Method of Inclusion of International Sample Firms

	5-Year			10-Year		
Levered Equity Beta	**AUS**	**RoW**	**Total**	**AUS**	**RoW**	**Total**
Full Pooling (Equal Weighted)	0.60	0.91	0.88	0.57	0.86	0.83
Full Pooling (Value Weighted)	0.60	0.91	0.90	0.55	0.83	0.83
Country Pooling (Equal Weighted)	0.60	0.83	0.78	0.57	0.80	0.75
All figures presented are an equally weighted average of OLS and LAD estimations of beta at benchmark leverage. Market capitalisation and currency rates obtained from Bloomberg on 6 August 2022 (unlisted Australian companies measured at acquisition value). OLS and LAD estimates of equity beta for each firm are taken from Appendix 5 of the Explanatory Statement.						

The Panel notes that ERA is likely to be forced to more fully incorporate international comparators at the next review. It would be advised to further use the period covered by the current Instrument to further develop its point of view on how to best incorporate international comparators, as there is significant judgement as to what nations and firms should be included and how they should be incorporated, even if there is in principle support for their use.

Ultimately, there is no single correct approach to applying comparators and the ERA will require discretion to deal with the challenge of a diminishing local sample. In the face of difficult options, the Panel considers that the ERA's blended approach is appropriate and based on sound reasoning, noting again that the approach will need to be more fully developed in time for the next Instrument.

10.5.3 Estimation window

The choice of length of the estimation window is a trade-off between data relevance and statistical robustness. Longer estimation periods are more statistically robust but are also more likely to include data that is not relevant to current or future market conditions. Since the Instrument is forward looking it should be designed to reflect expectations, indicating that a shorter estimation window is preferable.

However, there has been significant volatility over the past five years (e.g., COVID-19, the invasion of Ukraine, M&A activity), so this period may not be representative of future

expectations, despite being more recent than a longer ten-year sample. The ERA has proposed the use of five-year estimation window using weekly data, and to also estimate 10-year betas.

The Panel considers the ERA's proposal of using a five-year estimation window using weekly data, and to also estimate 10-year betas, to be appropriate and based on sound reasoning.

10.5.4 Estimation method

For the 2022 draft Instrument the ERA approach uses OLS and the LAD estimators for estimating equity beta, where previously it used these plus two additional methods, the Maximum likelihood robust method (MM) and the Theil-Sen method (T-S) .Given the high correlation between MM, T-S and LAD and the fact that LAD can be more easily verified by external parties ERA proposed removing MM and T-S to rely on LAD for its robust estimator.

The Panel considers the use of LAD as the sole robust estimator to be appropriate and based on sound reasoning.

10.5.5 Low Beta bias

The low beta bias refers to the observation that ex-post returns from low beta stocks tend to outperform expected returns. The ERA proposes to continue the practice it used in the 2018 Instrument and not consider or adjust for low beta bias.

Given the Instrument seeks to approximate ex-ante expectations, not ex-post returns, the Panel considers the ERA's decision to not adjust for low beta bias to be reasonable.

11. DEBT AND EQUITY RAISING COSTS

11.1 Description

Debt and equity raising costs are the administrative costs and other charges incurred by regulated entities when obtaining and hedging finance. The ERA commissioned a Chairmont Consulting report on debt raising and hedging costs. The report suggested that the debt-raising cost allowance rise to 0.155 per cent per annum (from 0.100 per cent per annum in the 2018 Instrument) and the debt-hedging cost allowance rise to 0.123 per cent per annum (from 0.114 per cent per annum).

Multiple submissions were made, suggesting the ERA consider incorporating additional allowances into the debt raising costs, namely:

- higher arranger fees based on Bloomberg data
- issue price discount
- liquidity facilities costs
- three-month refinancing fee
- Environmental, Social and Governance (ESG) costs

11.2 Panel Assessment

The Panel notes that the sum of the proposed changes versus the 2018 Instrument is 0.064 per cent per annum, indicating that these costs have a much smaller impact than many of the inputs previously addressed (see, for example, the sensitivity of the rate of return to the choice of sample firms, averaging of time periods, and the weighting of the DGM).

The Panel suggests the ERA provide a sensitivity analysis section in the Instrument to help the reader appreciating the relative impact of the various inputs.

Notwithstanding the above, the Panel considers the ERA approach to debt and equity raising costs to be appropriate and based on sound reasoning.

The various allowances listed above are discussed in turn below.

11.3.1 Higher arranger fees

One submission suggested that Bloomberg data be used to estimate the arranger fee. This suggestion is reasonable to the extent that it would increase transparency vis-a-vis the Chairmont report. However, the use of Bloomberg data potentially reduces data relevance, as many factors that don’t lend themselves to Bloomberg filters affect fees.

11.3.2 Panel Assessment

The Panel considers that the ERA's addition of 1 basis point per annum to partially incorporate the insights available from the Bloomberg sample is appropriate.

11.4.1 Issue price discount

The Competition Economists Group (CEG), commissioned by ATCO, argued that the Chairmont's report erred by not including a second component of the arranger fee, the value of the discount to the market price of the bond issue retained by the arranger.

11.4.2 Panel Assessment

The Panel considers that many factors cause trading prices to differ from issued prices, not all of which may be related to the fee paid by the issuers. It considers the ERA's decision not to consider issue price discounts to be appropriate.

11.5.1 Liquidity facilities costs

Chairmont excludes liquidity facilities costs from the debt issuing cost allowance. In contrast, all submissions that discussed the topic supported the inclusion of liquidity facilities costs in the debt raising cost estimates. Chairmont recognises that there are costs of establishing and maintaining liquidity facilities but has argued that these costs should be considered as being part of the cost of debt, whereas the CEG argues it is a cost of raising debt.

11.5.2 Panel Assessment

It is not clear to the Panel whether liquidity facilities costs are costs of debt or debt raising costs, direct costs of maintaining the benchmark BBB+ credit rating, or whether these costs would be accommodated by regulatory cashflows and/or in the working capital allowance. The Panel considers the ERA's decision to not make an allowance for liquidity facilities costs in the debt raising costs to be appropriate but suggests that the matter of liquidity facilities costs is clarified in future Instrument reviews.

11.6.1 Three-month refinancing fee

Some submissions argued that credit rating agencies require that debt is refinanced at least three months prior to maturity. This may result in costs to the regulated entity in the form of the difference between the 10-year cost of debt and the three-month return on investing in a liquid asset.

11.6.2 Panel Assessment

It is not clear to the Panel whether this fee is a direct cost of efficiently maintaining the Benchmark BBB+ credit rating. The ERA argues that the benchmark debt strategy inherently minimises refinancing risks through, for example, the 10 per cent of debt being refinanced each year. The ERA may consider more fully exploring this issue in future reviews, but the Panel considers the ERA's decision to not make an allowance for the three-month financing fee in the debt raising costs to be appropriate.

11.7.1 Environmental, Social and Governance (ESG) costs

It is clear that investor appetite for more sustainable investment has increased demand for ESG bonds and that credit agencies are increasingly establishing ESG principles and evaluation tools which affected a corporate credit rating.

11.7.2 Panel Assessment

ESG trends may increase the cost of debt or the cost of raising debt for the benchmark firm, but at present the nature and extent of this impact is unknown. As such, the Panel considers the ERA's decision to exclude ESG costs from the Instrument to be appropriate.

12. INFLATION

12.1 Description

An estimate of the expected rate of inflation is an important component in setting regulated revenues. The expected rate of inflation is required for rolling forward the regulatory asset base, determining depreciation allowances, and permits observation of the contributors to the real changes in tariffs.

The National Gas Rules Section 75(B)(2) require the ERA to determine a method that "is likely to result in the best estimates of expected inflation."

To meet this requirement, the ERA has chosen to estimate expected inflation using the Treasury bond implied inflation approach. The ERA implements this method using yield on five-year Treasury bonds, estimation of daily point estimates by linear interpolation, and a 20-day averaging period that is nominated in advance. This approach is unchanged from that used for the 2018 Instrument.

12.2 Panel Assessment

The Panel notes that other measures of inflation expectations are publicly available that are seemingly not considered by the ERA. This includes survey-based measures published by Consensus Economics and Roy Morgan, and the market-based "inflation swap" measure.

Market-based approaches to measuring inflation expectations offer advantages over survey and forecast-based measures. As the ERA notes (Para 1250), market-based measures allow for the aggregation of expectations from a wide array of economic agents.

Inflation swaps likely have an advantage over inflation-linked bonds since they involve no exchange of funds at initiation and so are less affected by a liquidity premium. However, the Australian inflation swap market remains comparatively small and illiquid. Therefore, deriving expectations using the Treasury bond implied inflation approach is preferable.

The choice of a five-year term is consistent with the regulatory cycle and consequently the regulatory approach for meeting the NPV=0 principle. The Panel supports the view that this would provide the best estimate of expected inflation over the regulatory period.

The ERA states that the term of the expected inflation rate is "consistent with the estimate of the risk-free rate" (Para 1245). However, the Panel notes that while this term is consistent with the five-year term of the interest rate swap rate used in computation of the rate of return on debt, it is not consistent with the 10-year term used to estimate the risk-free rate in relation to the rate of return on equity.

The Panel considers the approach can be readily replicated and that submissions received during the consultation period were supportive of this approach.

On balance, the Panel considers that the ERA's proposed approach to estimate inflation is appropriate and based on sound reasoning.

13. VALUE OF IMPUTATION CREDITS (GAMMA)

13.1 Description

The ERA determines gamma based on the utilisation approach using the Monkhouse formula, calculated as the product of the distribution rate and the utilisation rate. The draft Instrument applies a gamma of 0.5, being the product of a 0.9 distribution rate and a 0.6 utilisation rate.

The 0.9 distribution rate proposed by the ERA is consistent with Lally's (2021) estimate of the distribution rate based on the financial reports of the 50 largest ASX-listed firms (0.887) as well as his 2019 estimate (0.886).

The 0.6 utilisation rate is derived using the equity ownership approach to determine the value-weighted percentage of domestic investors in the Australian equity market. The ERA uses the national accounts of the ABS, based on a five-year average to March 2021 and rounded to the first decimal point.

13.2 Panel Assessment

The Panel recognises that there is a long history of debate around the appropriate estimation of gamma for regulatory purposes in Australian and that it remains contentious.

The Panel considers the ERA's use of a gamma of 0.5 in the Instrument to be appropriate and based on sound reasoning.

The Panel notes that whether the ASX 50 is representative of the benchmark efficient firm is open to debate, and the ERA may consider resolving this in future Instruments by answering the following questions:

- Does the distribution rate differ significantly between ASX50 and non-ASX50 firms?
- If so, is the benchmark firm an ASX50 firm?

APPENDIX A MEMBERS OF THE INDEPENDENT PANEL

Michael Cosgrave

Michael has over 25 years' experience in economic regulation at a senior level across the transport, energy, resources and communications sectors, principally with the Australian Competition and Consumer Commission. Michael was Chief Infrastructure Adviser at the ACCC and sat on the ACCC's Infrastructure Committee, Communications Committee, Electricity Project Board, Gas Project Board and Digital Platforms Committee. Previously Michael was Executive General Manager, Infrastructure Regulation Division at the ACCC.

Dr. Dane Etheridge

Dane is currently the Director of Mottlecah Consulting, a firm providing quantitative insights to strategic challenges facing organisations across the government, for profit, and not for profit sectors. Prior to this role, Dane was the Discipline Lead of Finance and Deputy Director of MBA and DBA programs at Curtin University. He remains an active researcher in the finance discipline and is currently supervising multiple doctoral students

Dane has a PhD in Corporate Finance and is a Chartered Financial Analyst (CFA) Charterholder and Certified Practicing Accountant.

Dr. Lee Smales

Lee is an Associate Professor (Finance) within the Accounting & Finance discipline at UWA Business School. Previously, Lee held appointments at Curtin University, Curtin Graduate School of Business, and University of New South Wales (where he completed his PhD in finance). Lee is a Fellow of the Higher Education Academy (FEHA) and a Chartered Financial Analyst (CFA) Charterholder, he was previously a Board member of the CFA Society of Perth.

Prior to his academic career, Lee spent 8-years trading foreign-exchange and interest rate derivatives with Citigroup. His research interests are closely aligned with this prior career and focus on market microstructure and information transmission within financial markets. Lee has published in a number of leading academic journals including the Journal of Banking & Finance, Journal of Financial Research, Pacific-Basin Finance Journal, International Review of Financial Analysis, Journal of Futures Markets, and the Journal of International Financial Markets, Institutions, and Money.

APPENDIX B LIST OF ACRONYMS

ABS	Australian Bureau of Statistics
AER	Australian Energy Regulator
ASX	Australian Securities Exchange
CAPM	Capital Asset Pricing Model
CEG	Competition Economists Group
CRG	Consumer Reference Group
DGM	Dividend Growth Model
ERA	Economic Regulation Authority
ES	Explanatory Statement for the 2022 Draft Gas Rate of Return Instrument
LAD	Least Absolute Deviation
MM	Maximum Likelihood Method
MRP	Market Risk Premium
NGL	National Gas Law (as implemented in Western Australia by the National Gas Access (WA) Act 2009)
NGO	National Gas Objective
NGR	National Gas Rules
OLS	Ordinary Least Squares
RAB	Regulatory Asset Base
RoW	Rest of World
T-S	Theil-Sen Method
WACC	Weighted Average Cost of Capital