



Cost of Capital – 10 Hot Topics July 2024

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Cost of Capital – 10 Hot Topics

The cost of capital is of major importance for infrastructure and utility businesses because they are capital-intensive. The Australian Energy Regulator (AER) estimates that the return on capital is typically about half of the total revenue of the electricity and gas networks it regulates.¹

Furthermore, small changes in the cost of capital lead to very large changes in regulated revenues. The AER estimates that a 1% change in the cost of capital results in an 8.2% change to regulated revenues.² Regulated revenues for electricity networks in Australia were \$12 billion in 2022, so a 1% change in the cost of capital would shift revenue by about \$1 billion.³

Consequently, estimates of the cost of capital are strongly contested. Consumers and regulated businesses try to persuade regulators to employ lower or higher values. This has generated debate across almost all elements of the cost of capital and there is rich and extensive literature on the subject, including litigation in the courts.

In more recent times (at least in Australia and New Zealand), the field of debate has narrowed as approaches have become more settled. There is still active engagement on a range of hot topics including:

- 1. Climate change** – Energy is at the centre of climate change action. Governments have introduced new emission reduction objectives into regulatory frameworks. How are regulators implementing these objectives in cost of capital and regulatory determinations more broadly?
- 2. Stability and predictability of approach** – Energy utilities are highly valued for their stable and predictable returns. How do regulators take this into account in their decision-making?
- 3. Reasonableness checks** – Regulators typically build up their cost of capital by applying models, data, and parameters. How do regulators know if the outcome is reasonable?
- 4. Diminishing set of publicly listed comparator firms** – Observing market outcomes is important for determining an appropriate cost of capital. How are regulators adapting to the diminishing set of comparator firms?

¹ AER Rate of Return Explanatory Statement February 2023, page 5

² AER Rate of Return Explanatory Statement February 2023, page 284

³ AER - Electricity network performance report 2023 - July 2023

5. **The term for estimating the cost of equity** – The expected cost of equity varies depending on the investment horizon. Should regulators match the term of the regulatory control period or use a longer period reflecting the life of the underlying assets?
6. **Accommodating large new investment** – To incorporate large-scale renewable energy projects, large augmentations of existing networks are needed. How do regulators factor these new investments into their cost of capital decisions, especially the cost of debt?
7. **The market risk premium** – The data and models for estimating the market risk premium are not very good. What methods should regulators use, and should they anticipate a relationship between the market risk premium and interest rates?
8. **Stranding risk for gas networks** – In the face of emission reduction actions, there is an expectation that the use of gas will decline. How do regulators factor in stranding risk?
9. **Competition for the right to supply** – Competition is always better than regulation where feasible. With climate action leading to large new transmission links, it is possible to open the construction and operation of these links to competition. How are regulators facilitating this competition, and how can they use the information from the auctions in their cost of capital processes?
10. **Merits review** – Good in theory, but bad for consumers and bad for everyone else (except the lawyers). What is the experience with merits review?

Outline

In this paper, I first provide an overview of each of the 10 hot topics. In the second half of the paper, I briefly touch on a range of other topics that did not make the top 10.

Terminology

The terminology in this space is often truncated and used imprecisely. For the most part, this doesn't seem to matter much because the meaning can usually be ascertained from the context (especially where formulae are employed). However, in some situations, precision is critical.

For the purposes of this paper, I will use the term *Cost of Capital* to refer to the cost to a firm of raising debt and equity capital. This is termed the weighted average cost of capital (WACC). The rate of return is the other side of the coin; it is the return investors expect from providing capital to a firm. Regulators typically try to set the rate of return used in their determinations to match the cost of capital the firm faces, so the distinction does not bind in our context.

There are myriad subcategories that can arise. For example, returns can be realized, expected, or required; they can be pre-tax or post-tax, nominal or real. Where precision matters, I will spell it out.

Key regulatory decisions

In this paper, I have focused on the:

- New Zealand Commerce Commission (NZCC) – new Input Methodologies published December 2023
- Australian Energy Regulator (AER) – new Rate of Return Instrument published February 2023; and
- Ofgem Network price controls 2021-2028 (RIIO-2)

10 hot topics

There are many topics that could be included in the top 10, and different analysts are likely to have different choices. The following are the topics that seem most important and relevant in my view.

1. Climate change objectives

Many countries now include climate change objectives in their utility regulation. In New Zealand, the Climate Change Response (Zero Carbon) Amendment Act (the Zero Carbon Act) applies. The NZCC explicitly considered this legislation in its 2023 review of the Input Methodologies.

The NZCC considered this aspect from two perspectives:

- decarbonisation, resulting in greater electrification and reduced reliance on natural gas; and
- a greater need for adaptation and resilience to natural hazards and events.⁴

In conclusion, the NZCC decided that specific adjustments to the cost of capital were not necessary. Instead, it pointed to the flexibility in the regulatory determinations to respond appropriately. It highlighted adaptability in demand and expenditure forecasts (including expenditure to increase resilience) and pass-through mechanisms and re-openers. It did make some adjustments to increase the flexibility available in these mechanisms.

In Australia, the National Electricity, Gas and Retail Laws were amended in September 2023 to introduce an energy emissions objective. The addition is included in section 7 (c):

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

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

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

(c) the achievement of targets set by a participating jurisdiction—

(i) for reducing Australia's greenhouse gas emissions; or

(ii) that are likely to contribute to reducing Australia's greenhouse gas emissions.⁵

⁴ New Zealand Commerce Commission, Context and summary of Final decisions, Part 4 Input Methodologies Review 2023 – Final decision, 13 December 2023, pages 13

⁵ National Electricity (South Australia) Act 1996, Schedule—National Electricity Law, Section 7

The AER's most recent decisions were almost finalized before the legislation came into effect, but the amendments were anticipated in the proposals it received and its decisions. The results are most evident in forecasting and resilience expenditure.

2. Stability and predictability of approach

It is common to see different regulators taking different approaches to key elements of the cost of capital. At times these differences can be quite material. Nevertheless, once an approach is employed there is considerable momentum to continue the chosen approach. The AER provides a clear example of this momentum. In its process, both consumers and regulated businesses submitted there should be a "high bar for change".⁶ The AER went on to explain the outcome of its considerations as follows:

We did not enter this process with the expectation of making only minimal changes. Instead, we have undertaken an extensive and open review, exploring all aspects of the rate of return in detail. As we progressed through our review, we found that the approach outlined in the 2018 Instrument is supported by data and financial principles.

When considering our decision, the approach in the 2018 Instrument has delivered outcomes that are align with the relevant risks. Therefore, we believe the NEO and NGO are best advanced by largely continuing our current approach. Minimising change is likely to promote stability and predictability which in turn supports efficient investment. We do not consider the criteria for making material changes to our approach have been met.⁷

Regulated utilities are attractive to investors because they are stable, low-risk businesses that offer consistent revenues and returns. This preference for stability extends to the regulatory framework and approach.

3. Reasonableness Checks

Typically, when regulators set the cost of capital, they do so by exercising regulatory judgment about a range of individual inputs, which are then brought together to generate a result. This is most prominent in the cost of equity, where it is not possible to observe expectations directly.

Consequently, once the result is derived, regulators tend to want to step back and ask themselves whether the result seems reasonable. However, there are considerable difficulties in assessing overall reasonableness. Firstly, the data available is no better (and

⁶ AER Rate of Return Explanatory Statement February 2023, page 8

⁷ AER Rate of Return Explanatory Statement February 2023, page 9

more likely worse) than the data used to estimate the individual components. Secondly, and more importantly, indicators of reasonableness are heavily influenced by factors outside of the cost of capital. For example, the profitability of regulated businesses depends on the impact of incentive schemes and the ability to outperform the regulator's opex and capex determinations. Therefore, any use of reasonableness checks is subject to a high degree of judgment.

Nevertheless, reasonableness checks play a central role in regulatory decision making. In 2012, the NZCC undertook a range of reasonableness checks of its final WACC. These checks were then reviewed by the New Zealand High Court on appeal. The High Court observed that:⁸

[1210] The comparative information against which the Commission tested its WACC estimates comprised:

- (a) yields on five-year Government stock and BBB+ corporate debt.*
- (b) estimates of the long-run historical returns earned by New Zealand investors on investments of average risk (over the period 1900-2009);*
- (c) estimates of future returns expected by New Zealand investors on investments of average risk.*
- (d) estimates of post-tax WACC in other regulatory contexts especially in New Zealand, Australia and the United Kingdom.*
- (e) independent estimates of the post-tax WACC for New Zealand monopolies; and*
- (f) estimates of the post-tax WACC using other approaches including the classical CAPM.*

The Court then went on to conclude that the Commission's cost of capital satisfied the reasonableness test, but the appellants would not if they were successful:

[1228] We therefore agree with Commission's conclusion that those independent estimates support the robustness and reasonableness of its WACC estimate. They do not, to use the Commission's words, identify any oddity or other like outcome in the Commission's estimates, such as might have required the Commission to change its approach. Moreover, those independent estimates strongly suggest that the WACC estimates that would result from allowing in full the appellants' appeals against the Commission's cost of capital IMs would be considerably more than those that would be appropriate given the Part 4 purposes.

Similarly, the AER undertook substantial cross-checking in its 2022 rate of return Instrument process. The cross-checks included: regulated asset base (RAB) multiples, financeability

⁸ WELLINGTON INTERNATIONAL AIRPORT LTD & ORS v COMMERCE COMMISSION [2013] NZHC 3289 [11 December 2013], paras [1210 – 1228]

tests, scenario testing, historical profitability, investment trends, other regulators' rate of return and analysts' discount rates. The AER concluded:⁹

We have explored a range of measures that might provide some insight into the suitability of our overall rate of return. All these measures suffer limitations, but collectively may provide a sense-check of our overall outcome.

After reviewing the available cross-checks, a balanced assessment of the performance of the 2018 Instrument leads us to reasonably conclude that the 2018 Instrument has broadly performed adequately.

Among the cross-checks, RAB multiples are the most controversial, with some participants arguing that they have no value while others say they have great value. In respect of RAB multiples, the AER concluded:¹⁰

Overall, our further investigation leads us to conclude that our current and expected rates of return are at least sufficient (as part of the overall regulatory compensation to investors) and that the allowed return has not been below investor expectations.

The AER observed that cross-checks have also been employed by Ofgem and Ofwat:¹¹

For example, Ofgem uses the following cross-checks for its cost of equity estimate:

- Modigliani-Miller cost of equity inference (weighted average cost of capital cross-check)
- market-to-asset ratio (MAR) implied cost of equity
- unadjusted offshore transmission owner (OFTO) implied equity internal rate of return (IRR)
- adjusted OFTO implied cost of equity
- unadjusted investment managers' total market return (TMR) cost of equity
- unadjusted infrastructure fund implied equity IRR
- CAPM with 0.9 equity beta and investment managers' TMR.

However, in its most recent decision, Ofgem made no adjustment to the rate of return based on the findings of cross-checks. Further, Ofgem's latest draft decision (ED2 from June 2022) shows that CAPM is used without adjustment even though cross-checks supported lower values, stating that: '...we do not adjust the results [...] because we are mindful that no cross-check is perfect, and we are confident that CAPM should remain the primary model.'

The Water Services Regulation Authority in the UK (Ofwat) has recently discussed the use of cross-checks in its draft methodology for PR24,611 stating that it intends to 'set the allowed return on equity on the basis of the CAPM [and does] not envisage departing from the CAPM-

⁹ AER Rate of Return Explanatory Statement February 2023, page 24

¹⁰ AER Rate of Return Explanatory Statement February 2023, page 26

¹¹ AER Rate of Return Explanatory Statement February 2023, page 254

derived estimate of the allowed return, unless there is strong and compelling evidence from market-based cross-checks.’ Further, Ofwat notes that ‘there should be a high evidential bar for moving away from [a] central estimate [and] expect that any adjustment would be modest and would in any case lie within the endpoints of the CAPM derived cost of equity range.’

Ofwat proposed to use the market-to-asset ratio analysis (that is, RAB multiples) as the main cross-check in determining the allowed cost of equity, noting that ‘[Ofwat does] not envisage departing from the CAPM-derived central estimate of the allowed return, unless there is strong and compelling evidence from market-based cross-checks such as MAR analysis.’

Ofwat’s recently published final methodology for PR24 proposes that there is not ‘sufficiently strong evidence from our MAR-based cross-check to choose a point estimate other than our central CAPM-derived point estimate.’

4. The diminishing set of publicly listed comparator firms

In recent years, we have seen a trend where publicly listed utility firms have been acquired by private equity firms and subsequently delisted, resulting in the unavailability of data on their traded equity betas.

Most importantly, in Australia, the two best comparator firms, Spark Infrastructure and AusNet, have been acquired and delisted. Typically, these acquisitions have taken place at values well exceeding the regulatory asset base.

With this diminishing data set, regulators are faced with using increasingly old data or drawing on data from firms that are less comparable, including international firms.

In 2016, the NZCC drew on an energy comparator sample included 74 companies from New Zealand, Australia, United States, and United Kingdom. In its final decision in 2023, 51 comparator firms were included. The resulting equity betas were like those calculated in 2016.

Unless there is a change in the trend of acquisitions, regulators are likely to face a comparator set that is smaller and less representative. This decline is felt most acutely when estimating equity beta, but also impacts credit ratings and gearing.

The AER has signalled that it intends to undertake further work on the comparator set:¹²

We have also engaged on this issue as part of our working paper series, as well as our draft Instrument. Having considered the latest submissions and other relevant evidence before us, our view remains that there are likely considerable complexities around developing an approach using international firms as comparators. International firms likely have different characteristics and operating and market environments to the regulated ‘pure play’ Australian energy network businesses and, as a result, may not be directly comparable to those we regulate. We intend to undertake work on this issue in advance of the 2026 Instrument, particularly considering the diminishing number of comparators.

5. The term for estimating cost of equity

There has been a long-standing question about whether the cost of equity should be estimated based on the length of the regulatory period or a period more consistent with the life of the underlying assets. Regulators have taken different approaches in the past and have changed their approaches. For example, the Queensland Competition Authority and Economic Regulatory Authority in Western Australia previously employed a term matching the length of the regulatory period but switched to 10-year terms in 2021 and 2022 respectively.

The AER considered changing from a 10-year term to a 5-year term in 2022, but ultimately decided to stay with a 10-year term. Even though the shift would only have a small impact on the total return (once consequential amendments to other parameters were made), the shift was strongly opposed by regulated networks. The networks indicated their opposition was because the shift would undermine the stability and predictability of the current framework “if the AER makes this change, what other changes might be coming in the future?”.

In its review of its Input Methodologies, the NZCC was under considerable pressure to switch from its practice of matching the term of the regulatory period to match the approaches employed in Australia. Ultimately, it decided to maintain its current approach. The NZCC concluded that:

Using a term for the risk-free rate for debt and equity that is matched to the length of the regulatory period ensures consistency in the way in which debt and equity are estimated:

¹² AER Rate of Return Explanatory Statement February 2023, page 19

- Estimates of the risk-free rate used for expert valuations are used in a different context to WACC estimates
- In the IMs merits appeals judgment, the High Court agreed with the principle that “the term of the risk-free rate should be aligned to the regulatory term to avoid over and under compensation.”
- Several suppliers, with the power to set prices as they see fit and which set their own cost of capital when pricing their services, adopt a term of the risk-free rate that matches their pricing period.¹³

6. Accommodating large new investment

There is a tendency among regulators to employ long-term averages in their cost of capital. For example:

- The AER employs a trailing average cost of debt.
- Ofgem uses a long-term return on equity.

In respect of the cost of debt, utility businesses typically raise debt in a portfolio that spans several years. This means a relatively small proportion of the total debt falls due for renewal each year. In this way, the business can mitigate its financing risk. However, if the regulator sets the cost of debt at each determination, then the business faces interest rate risk unless it can hedge a large proportion of its debt portfolio during the determination window.

If the regulator employs a trailing average approach where a proportion of the cost of debt is updated each year, then the business faces much less pressure to hedge its interest rate risk. In addition, the trailing average approach tends to smooth variations in interest rates, so consumers face a smoother price path across regulatory periods.

These approaches work fine when regulating a business with a stable regulatory asset base and steady year-on-year capital additions. However, long-term averages can be far from the prevailing cost of capital at points in time. In the current circumstances where very large investments in transmission links are needed to support new renewable generation, investment incentives can be distorted.

In Australia, the NSW electricity business, Trans grid, is in the process of constructing several new links that have the potential to double its regulatory asset base over a short period. The trailing average cost of debt employed by the AER is currently below the prevailing cost of debt and this may inhibit the new investment.

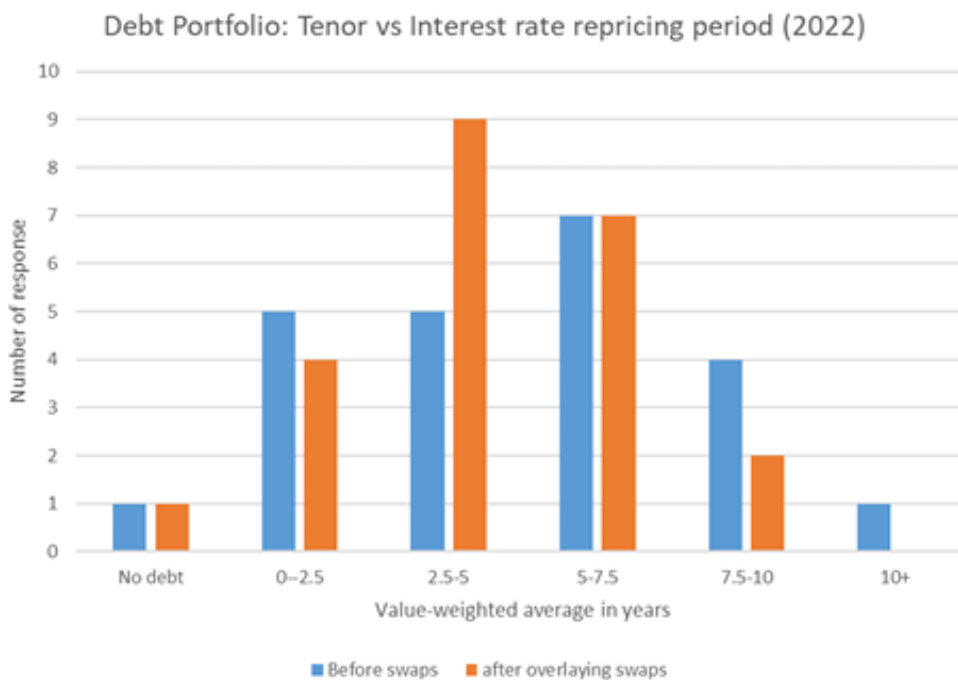
¹³ New Zealand Commerce Commission, Cost of capital topic paper, Part 4 Input Methodologies Review 2023 – Final decision, 13 December 2023, pages 97 -98

The AER recognized this potential issue in its draft Rate of Return instrument and proposed introducing a weighted trailing average based on expected additions to the capital base. The AER set out detail on how the weighted average would operate. However, there was very little support for making the change from stakeholders, including Trans grid. The AER noted that it expects the change in regulatory asset bases to be gradual, with the new projects going through regulatory investment tests and early stages of construction and this would minimize pressure on the trailing average.¹⁴ The AER intends to undertake further work in advance of the next rate of return instrument.

The NZCC employs a prevailing cost of debt approach and received submissions that it should switch to a trailing average. The NZCC decided to maintain its current approach noting:¹⁵

- regulated suppliers can use interest rate swaps to materially hedge their risk-free rate exposure without significant hurdles (see Figure repeated below)
- it has tools other than the WACC for smoothing prices
- the trailing average could weaken the signals with respect to new investment in infrastructure and
- there are practical difficulties in implementing a trailing average

Figure 1: Regulated Suppliers’ Debt Portfolios: Tenor vs. Interest Rate Repricing Period



¹⁴ For a discussion of the issues see: AER Rate of Return Explanatory Statement February 2023, page 233 ff.

¹⁵ New Zealand Commerce Commission, Cost of capital topic paper, Part 4 Input Methodologies Review 2023 – Final decision, 13 December 2023, pages 28 - 37

7. The market risk premium

The market risk premium (MRP) is the most challenging element of the cost of capital for regulators. Part of this challenge is that there are very different potential approaches depending on the cost of equity model or models employed. The major classes of models include:

- The standard Capital Asset Pricing Model (CAPM). In this model, the MRP is one of 3 fundamental inputs to determining the cost of equity:

$$E[ri]=rf+\beta i(E[rm]-rf)$$

where $E[ri]$ is the expected rate of return on asset i when the price is in equilibrium, m is the market portfolio with expected rate of return $E[rm]$, the risk-free rate of return is rf and βi is a standardized measure of covariance risk, which represents non-diversifiable risk of asset i . The term $E[rm]-rf$ is the MRP.

- The Fama-French 3 factor model seeks to determine the cost of equity directly by regressing realized returns against various factors.
- Dividend growth models (DGM) are a class of models used to compute the implied cost of capital. Given the expected cash flows for an asset and the current price, the internal rate of return that equates the present value of the expected cash flows to the current price gives the cost of capital for that asset. In other words, the cost of capital is backed out from a valuation model. From the derived return on equity, the MRP can then be derived.
- The Wright approach assumes that the market return is constant and then employs a long run average of that return. The consequence of this method is that changes in interest rates are offset one for one by changes in the market risk premium. Thus, if the risk-free rate drops one percent the market risk premium rises by one percent.¹⁶

Most regulators employ the CAPM. As such, they need a way to estimate the MRP. A common approach is to set a fixed MRP for a period and revisit it every so often. Under this approach the cost of equity varies one-for-one with the underlying risk-free rate. This contrasts with the Wright approach, where the cost of equity is fixed and does not move at the risk-free rate.

The AER has considered how to estimate the MRP. The approaches it has considered include historical excess returns, DGMs, surveys, conditioning variables and total market returns.¹⁷ In its draft decision it considered using a blended approach with an estimate derived 50%

¹⁶ See Report to the AER: Alternative asset pricing models, By Graham Partington and Stephen Satchell 30 June 2020

¹⁷ See AER Rate of Return Explanatory Statement February 2023, chapter 7.

from historical excess returns and 50% from the 3-stage DGM. There was little support from stakeholders for this approach, so the AER continued with a fixed MRP for the life of its rate of return instrument.

The NZCC uses three main approaches to estimating the MRP including:

- studies of historic returns on shares relative to the risk-free rate.
- surveys of investors asking them to state their expected rate of return for the overall market; and
- empirical estimates of the MRP from share prices and expected dividends.¹⁸
- The NZCC then determined a fixed value of 0.7 to include in its IM.

Professor Aswath Damodaran publishes an annual update for estimating the equity risk premium that provides further details.¹⁹

The Independent Pricing and Regulatory Tribunal in NSW (IPART), uses a blended approach which estimates the cost of equity as the midpoint between our estimates of the current and historic cost of equity. The historic cost of equity employs a historical estimate of excess returns as the MRP. The current cost of equity uses the median value of the MRP derived from 6 methods:

1. Damodaran 2013 method
2. Bank of England 2002 method
3. Bank of England 2010 method
4. Bloomberg method
5. SFG (now Frontier Economics) analysts forecast method
6. SFG (now Frontier Economics) market indicator method.

The first four of these methods are variations of the DDM. They differ in detail, but all infer a forward-looking market average return on equity based on expected dividends. The fifth is another variation of the DDM, which uses the forecasts of stock market analysts for individual stocks and a DDM. The sixth method uses four economic indicators to derive an indirect estimate of the MRP.²⁰

¹⁸ New Zealand Commerce Commission, Cost of capital topic paper, Part 4 Input Methodologies Review 2023 – Final decision, 13 December 2023, pages 177

¹⁹ Professor Aswath Damodaran Equity Risk Premiums (ERP): Determinants, Estimation and Implications - The 2023 Edition 143 Pages Posted: 3 Apr 2023, https://papers.ssrn.com/sol3/papers.cfm?abstract_id=4398884

²⁰ IPART, Review of our WACC method, February 2018, page 52

8. Stranding risk for gas networks

Controversially, in its 2022 Input Methodologies decision, the NZCC allowed for the shortening of asset lives for gas pipelines, in effect, bringing forward depreciation to reduce asset stranding risk. This decision was appealed by the Major Gas Users' Group to the High Court of New Zealand.²¹ The appeal was dismissed in favour of the NZCC's approach. The Court concluded that stranding risk needed to be addressed somewhere within the regulatory framework. Typically, for a firm in a workably competitive market, that risk would be compensated up-front through expected returns. However, in the case of regulated gas networks, that approach is not feasible, and some ex-post accommodation is required. The NZCC's approach of an early return of capital was viewed as reasonable.

The Court considered a range of interesting questions including: Is stranding risk already addressed through the weighted average cost of capital component – or otherwise provided for in the input methodologies? Is there provision for asymmetric risk in the WACC? Is there double counting? and is the 2022 Input Methodologies Decision premature?

Like the NZCC, the AER has introduced a degree of accelerated depreciation for gas pipelines. In the case of Evoenergy in the Australian Capital Territory, the AER concluded that accelerated depreciation via shorter asset lives was warranted:

*In light of the elevated risk of network closure and a substantial reduction in demand, we consider our final decision is a prudent and responsible first step to protect the long-term interests of Evoenergy's gas consumers from asset stranding risk.*²²

The AER noted that it would not be prudent for the network owner to add substantial new discretionary investment capital in the current environment.

But what gas network closure advances far more rapidly than anticipated? It depends on whether customers are locked in or can exit the network. If customers are locked in, they will pay higher prices to recover the outstanding capital over a shorter period. On the other hand, if demand and customer numbers decline, which is more likely, the remaining customers will face rapidly increasing prices. At this point, it may no longer be possible for the network to charge the regulatorily determined prices because it will accelerate the "death spiral." Options at this stage include deregulating the network, leaving the risk to be managed by the equity holders, or government intervention to support customers or the asset owners.

²¹ MAJOR GAS USERS' GROUP INC v COMMERCE COMMISSION [2024] NZHC 959 [29 April 2024]

²² Final decision, Evoenergy Access Arrangement 2021 to 2026, Overview, April 2021, page 10

9. Competition for the right to supply

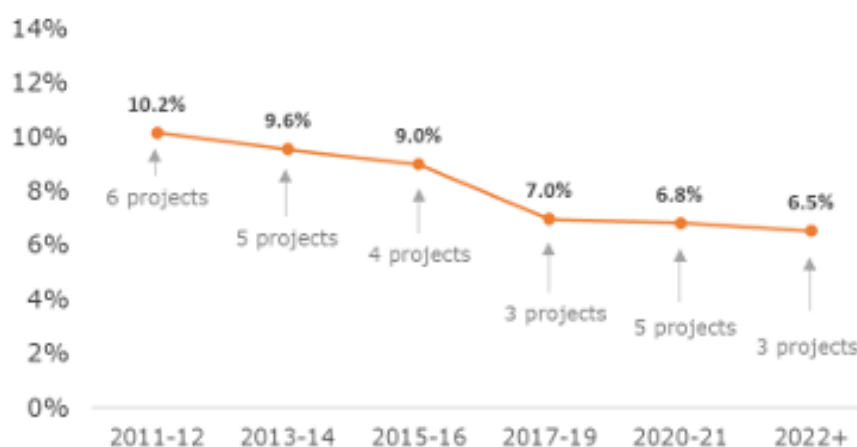
With new large-scale links being built to support renewable energy generation, there is an option for these links to be built and operated through a competitive tender process. Provided the competitive tender is robust, this is an excellent opportunity to avoid the need for regulation altogether. Further, the information revealed in these processes could be used by regulators to cross-check the cost of capital they are employing in their regulatory decisions.

There are 2 recent prominent examples: UK offshore wind transmission and NSW renewable energy zones (REZ).

In the UK, the right to build, own and operate offshore wind transmission lines has been auctioned. From the auction results, it is possible to estimate and implied cost of capital. Ofgem has published the results of its analysis.

We previously referred to OFTO bids in December 2018²³, May 2019 and July 2020 where we used OFTO bids to derive the average implied equity IRR (nominal, post-tax). We acknowledge that there are risk differences between DNOs and OFTOs. OFTOs are not subject to cyclical price controls (such as RIIO-ED2) that apply to the onshore electricity distribution assets. However, we believe that this cross-check is valuable because it relates to electricity network assets, where Ofgem issues and modifies licences, as it does for the electricity distribution sector.²³

Figure 2: Offshore Transmission Owner – average nominal post-tax equity IRR (weighted by project transfer value)



In NSW, EnergyCo is leading the development of the renewable energy zone (REZ) transmission network infrastructure as the Infrastructure Planner. EnergyCo is responsible for

²³ Ofgem, Consultation, RIIO-ED2 Draft Determinations – Finance Annex, 29 June 2022, page 45.

developing and overseeing the planning and approval processes for the REZ network infrastructure. Its first major project is the Central-West Orana REZ which will be serviced by new transmission network infrastructure, including transmission lines and energy hubs. EnergyCo is currently running a competitive tender process to appoint a Network Operator to design, build, finance, operate and maintain the REZ transmission network.²⁴

10. Merits review

While merits review is not strictly a cost of capital issue, its influence on cost of capital is of the highest importance.

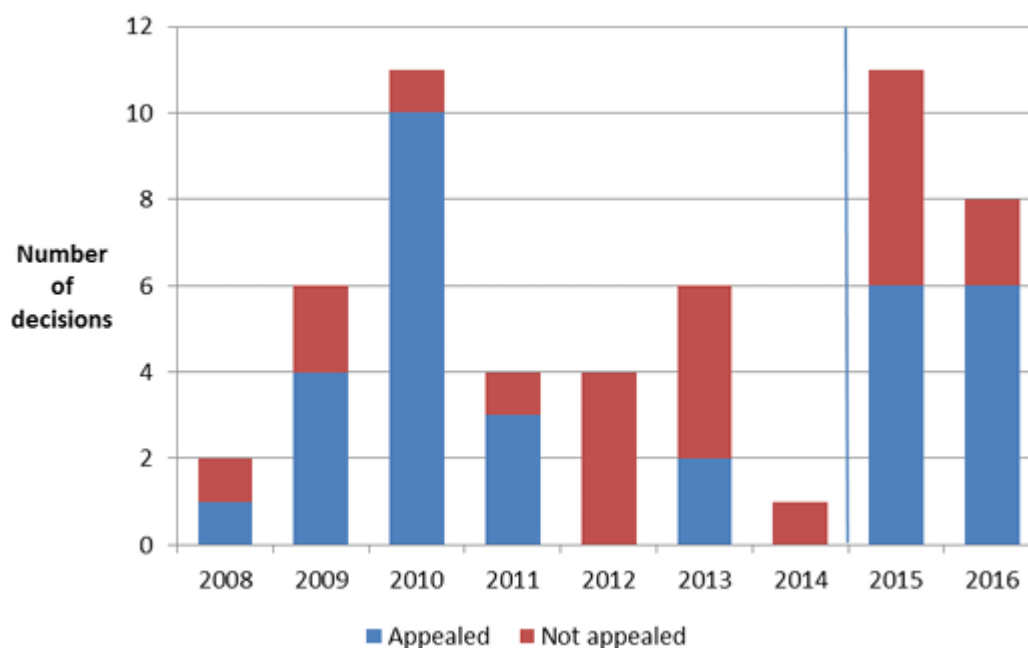
Regulatory determinations embody the exercise of judgment. Otherwise, regulatory outcomes could be coded in legislation and there would be no need for regulators. When exercising judgment, it is possible for regulators to err. Merits review provides a mechanism for regulatory judgements to be tested and corrected if made in error. On face value, this logic is compelling. However, in practice, merits review has the potential to result in highly undesirable outcomes. This was the case in Australia, and ultimately led to the removal of merits review.

In Australia, the use of merits review of regulator decisions was commonplace. Between 2008 and 2016 reviews were sought on 32 out of 51 regulatory decisions (62%). Even after reforms were made in 2014 to rebalance and minimise reviews, 12 out of 19 decisions were taken to review (63%). Of all the matters that were varied or remitted back to the primary decision maker, none resulted in a decrease in revenues for the regulated business compared to the original decision.²⁵

²⁴ <https://www.energyco.nsw.gov.au/cwo>

²⁵ AER Submission, Review of the limited merits review framework, October 2016, page 15

Figure 3: Number of AER regulatory decisions appealed under limited merits review



In its submission to the review of limited merits review, the AER stated:

The practical lack of downside risk in seeking a review, coupled with the potential for significant increases in revenues, means that service providers pursue limited merits reviews of our decisions as a routine part of the determination process. ... As a result, regulatory proposals are commonly drafted in a highly legalistic tone. In some cases, service providers have submitted reports prepared by legal counsel. The focus of the proposals has been diverted from being economically persuasive to being legally defensible on appeal. It also makes it harder for other stakeholders, without access to lawyers, to engage with the arguments in such submissions.²⁶

In the second reading speech on the Bill to abolish limited merits review the Minister noted a range of problems with the framework:

To date LMR has increased consumer bills by \$6.5 billion.... the Council of Australian Governments (COAG) Energy Council reviewed the LMR regime again in 2016. The review found that the 2013 amendments to the regime had largely failed, including that LMR: remained routine; had significant costs to all participants; presented barriers to meaningful consumer participation; led to significant regulatory and price uncertainty; and was failing to demonstrate outcomes that were in the long-term interests of consumers....

²⁶ AER Submission, Review of the limited merits review framework, October 2016, page 15 -16

In the face of escalating energy prices the government is taking action to stop energy networks using the LMR to extract monopoly rents from consumers.²⁷

Since the removal of limited merits review, the regulatory framework in Australia has fundamentally changed. Instead of regulation being “something that is done to consumers,” regulated networks are undertaking extensive and meaningful engagement with consumers, giving them a real say in the proposals they submit to the regulator.

The Powerlink Queensland electricity transmission decision in 2022 was a watershed moment in the cycle of regulatory determinations. Powerlink approached its determination with the objective of putting forward a proposal that was capable of acceptance by consumers, the regulator, and itself.

In its final decision, the AER noted:

This final decision recognises the collaborative efforts of Powerlink and its stakeholders, particularly Powerlink’s Customer Panel and its Revenue Proposal Reference Group (RPRG), who worked together constructively in developing Powerlink’s proposal over almost three years for the long-term interests of consumers.

Powerlink put forward a well-informed initial proposal, underpinned by significant consumer engagement and its overarching goal of lodging a proposal that is acceptable to Powerlink, its consumers and the AER. This allowed us to undertake a targeted review of the proposal, focussing on the key areas of concern raised by stakeholders and our own assessments. This led us to determine that the proposal was capable of acceptance at the draft decision stage of this revenue determination process.

The high-quality nature of Powerlink’s initial proposal has meant that the final stage of this process, where we assessed Powerlink’s revised proposal, has been non-contentious and a more efficient regulatory process for all stakeholders, including Powerlink, consumers and the AER. It is worth noting that Powerlink’s revised proposal was lodged two weeks early, allowing stakeholders extra time to consider the proposal and Powerlink staff to resume their focus on network operations.²⁸

This trend has continued. It is brilliant to see consumers at the centre of the regulatory process rather than lawyers. In the most recent round of regulatory proposals, consumer engagement and influence has been a dominant feature. In almost all cases, the AER has been able to accept the proposals put to it, rather than intervening.

²⁷ HOUSE OF REPRESENTATIVES, BILLS, Competition and Consumer Amendment (Abolition of Limited Merits Review) Bill 2017, Second Reading Speech, Thursday, 10 August 2017

²⁸ AER, Final Decision Powerlink Queensland Transmission Determination 2022 to 2027 (1 July 2022 to 30 June 2027), April 2022

Table 1: Outcomes of AER’s most recent regulatory determinations²⁹

Business	Total Opex proposed	Total Capex proposed
Ausgrid NSW electricity distribution	Accepted in final decision	6.1% reduction
Endeavour Energy NSW electricity distribution	Accepted in final decision	Accepted in final decision
Essential Energy NSW electricity distribution	Accepted in final decision	Accepted in final decision
Evoenergy ACT electricity distribution	Accepted in final decision	Accepted in final decision
Power and Water Corporation NT electricity distribution	Accepted in final decision	Accepted in final decision
TasNetworks Tasmania electricity transmission	TasNetworks accepted the AER’s draft decision in its revised proposal	Accepted in final decision
TasNetworks Tasmania electricity distribution	TasNetworks accepted the AER’s draft decision in its revised proposal	Accepted in final decision

²⁹ Links to decision documents can be found in: AER News release, Final revenue decisions balance affordability and required investment, 30 April 2024

Honourable mentions

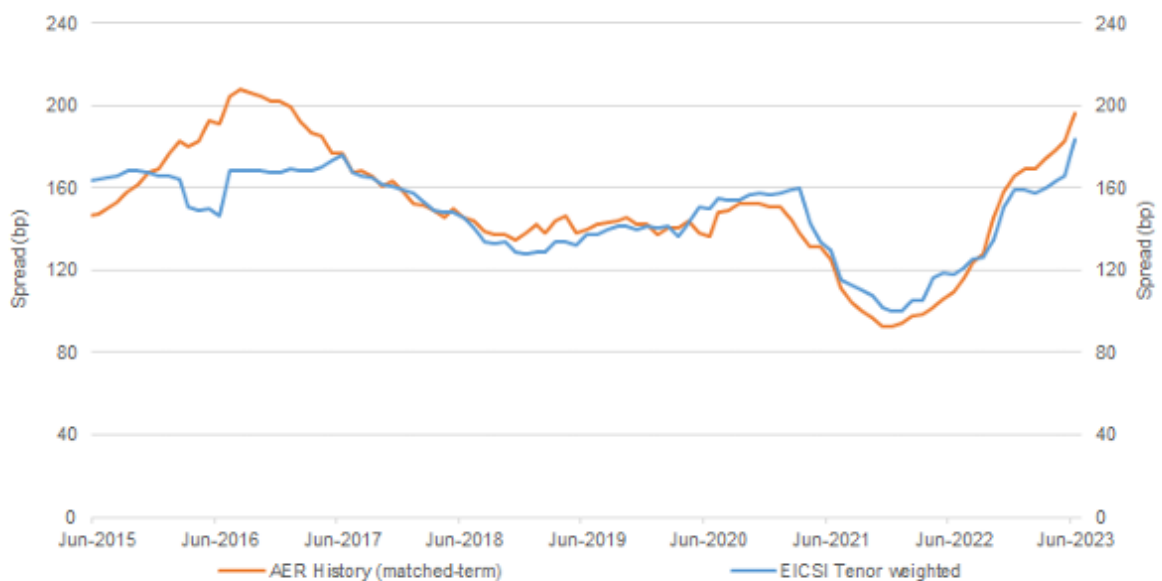
While not making our top 10, the following issues are worth a mention.

1. Accurately estimating the cost of debt

It is possible for regulators to very accurately measure and then estimate the forward cost of debt. The AER uses an approach where it obtains details of each debt instrument issued by the private businesses it regulates. This data is sensitive, so the process is conducted in confidence. The AER then publishes a summary of its analysis which shows how the actual cost of debt is tracking against the yield curves it employs for estimating the cost of debt.

This analysis shows that there is a very close correlation between the actual cost of debt and the AER’s estimates.

Figure 4: Comparison of energy infrastructure credit spread index (EICSI) vs AER estimates of cost of debt: 12-month rolling average (tenor weighted) against AER A/BBB (matched-term) estimate (June 2015 to June 2023)³⁰



³⁰ AER, Rate of Return Annual Update 2023, December 2023, page 29.

2. Convenience yield and the risk-free rate

This issue arose in a Competition Markets Authority decision in 2021.³¹ Since then, it has been raised in front of multiple regulators, but to date accepted by none. The argument is “in contrast to the highest-quality non-government bonds, government bonds have special properties that create additional demand for these instruments, which pushes the government bond yield to fall below a ‘true’ risk free rate based on a zero beta asset”.³²

The proposed solution is to add a convenience yield to the risk free rate or include high quality non-government bonds in the estimate of the risk free rate.

The NZCC did not agree to depart from using government bonds to estimate the risk free rate. It noted:

- We were not aware of any practitioners in New Zealand that use bonds other than government bonds to estimate the risk-free rate
- It would not always be possible to find sufficiently liquid corporate bonds with the required credit rating to use to estimate the risk-free rate
- There are practical problems estimating a convenience yield
- Ofgem concluded that the overwhelming weight of academic evidence favours the use of government bonds as the risk-free asset.³³

Similarly, the AER considered a convenience yield in depth and decided not to employ the approach.³⁴

3. Weighting debt and equity

The “W” in WACC stands for weighted. Regulators typically estimate the cost of debt and equity separately and then bring them together using a ratio. A common ratio is 60% debt and 40% equity. This ratio has tended to be relatively uncontroversial.

The AER updates its estimate at each rate of return review. The data shows that businesses employ a ratio that is largely stable. The AER received an interest paper from Professor Graham Partington and Stephen Satchell that concluded:

³¹ CMA (2021), ‘Anglian Water Services Limited, Bristol Water plc, Northumbrian Water Limited and Yorkshire Water Services Limited price determinations: Final report’, 17 March, para. 9.92,

³² New Zealand Commerce Commission, Cost of capital topic paper, Part 4 Input Methodologies Review 2023 – Final decision, 13 December 2023, pages 96 citing a submission by OXERA

³³ New Zealand Commerce Commission, Cost of capital topic paper, Part 4 Input Methodologies Review 2023 – Final decision, 13 December 2023, pages 98 -99

³⁴ AER, Rate of return, Term of the rate of return & Rate of return and cashflows in a low interest rate Environment, Final working paper, September 2021. (Especially see Appendix A).

Our discussion and analysis focuses on a number of features of WACC. We argue that WACC does not change a great deal with changes in leverage, largely because there are arbitrages that come into play. Except at extreme levels of leverage, the effects of arbitrage are likely to render the value of the firm relatively invariant to changes in leverage.³⁵

4. Financeability testing

It is not uncommon to find submissions that advocated for the use of financeability testing. The NZCC concluded:

We consider that financing the preferred path of recovery of investment (the one that best promotes the Part 4 purpose) is primarily the responsibility of suppliers. They have a range of tools for doing so, including reducing dividend payments, or raising debt and/or equity. In addition, we are not aware of a shortage of capital currently in this sector. To the contrary, we continue to see transactions at RAB multiples above one, and improving credit ratings.³⁶

5. Totex

The mix of opex and capex used in a regulatory determination of itself, is not a cost of capital issue. However, the mix has a material impact on cash flow and measures of financeability.

Ofgem employs a totex approach where a total expenditure of opex and capex is determined and the regulated business then has a degree of flexibility in the balance of opex and capex going forward. Under the totex approach, there is a risk that regulated businesses will favour opex over capex to increase cash flows in the short term.

The NZCC received some submissions that carbon reduction required further incentives for capex, such as the totex framework employed by Ofgem. It concluded:

Of the alternative expenditure incentive approaches that we considered, such as a totex approach (including a totex incentive mechanism), our decision is that none better promote our Framework's overarching objectives than the current expenditure incentive mechanisms.³⁷

³⁵ Graham Partington and Stephen Satchell - Report to the AER – WACC and Leverage - 19 May 2021

³⁶ New Zealand Commerce Commission, Context and summary of Final decisions, Part 4 Input Methodologies Review 2023 – Final decision, 13 December 2023, pages 29

³⁷ New Zealand Commerce Commission, Context and summary of Final decisions, Part 4 Input Methodologies Review 2023 – Final decision, 13 December 2023, pages 26

6. Split cost of capital

A split cost of capital would involve applying different WACC values to existing 'sunk' assets and capital on new assets.

The NZCC considered that its approach provides suppliers with incentives to invest without providing for a different WACC. Non-systematic risks can be more appropriately dealt with through measures outside of the WACC.³⁸

7. Standard error of the cost of capital

The NZCC employs a peculiar approach where it estimates a standard error for the cost of capital and then adjusts the final value of the cost of capital based on its judgement on where the probability of error should sit.

When exercising this judgement, the NZCC considers potential asymmetry in the consequences of setting an incorrect cost of capital.

Setting the WACC too high is expensive for consumers because they pay higher bills. However, setting the WACC too low may result in even higher costs for consumers if it leads to outages. Outages from an unreliable network are expensive for consumers and remediating an unreliable network is likely to take some time.³⁹

The NZCC ultimately decided to set the cost of capital for electricity business at the 65th percentile (down from the 67th percentile). This approach seems to have had its genesis in a major electricity cable failure into New Zealand's largest city (Auckland) in 1998. The failure resulted in electricity outages and major disruption for 5 weeks.

8. Indexation of the regulatory asset base

Previously, the NZCC did not index the regulatory asset base for Transpower. When the regulatory asset base is indexed, investors receive part of their total return through capital accumulation rather than cash.

The NZCC decided that it would change its approach for Transpower and index the regulatory asset base going forward. It considered "the benefits of indexation (protection from inflation

³⁸ New Zealand Commerce Commission, Cost of capital topic paper, Part 4 Input Methodologies Review 2023 – Final decision, 13 December 2023, pages 284

³⁹ New Zealand Commerce Commission, Cost of capital topic paper, Part 4 Input Methodologies Review 2023 – Final decision, 13 December 2023, pages 219

and promoting pricing profiles that are more likely to be consistent with allocative efficiency) justify the change".⁴⁰

9. Inflation forecasting

Estimates of actual and forecast inflation are employed in many places within the regulatory models and cost of capital estimates. The issues are extensive and complex. The AER undertook an extensive review of inflation in 2021.⁴¹

⁴⁰ New Zealand Commerce Commission, Context and summary of Final decisions, Part 4 Input Methodologies Review 2023 – Final decision, 13 December 2023, pages 31


⁴¹ AER - Final position paper - Regulatory treatment of inflation - December 2020


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