



# Updating the 2022 ISP Discount Rate

A report prepared for AEMO

December 2022

Synergies Economic Consulting Pty Ltd  
[www.synergies.com.au](http://www.synergies.com.au)

## Disclaimer

Synergies Economic Consulting (Synergies) has prepared this report exclusively for the use of the party or parties specified in the report (the client) for the purposes specified in the report (Purpose). The report must not be used by any person other than the client or a person authorised by the client or for any purpose other than the Purpose for which it was prepared.

The report is supplied in good faith and reflects the knowledge, expertise and experience of the consultants involved at the time of providing the report.

The matters dealt with in this report are limited to those requested by the client and those matters considered by Synergies to be relevant for the Purpose.

The information, data, opinions, evaluations, assessments and analysis referred to in, or relied upon in the preparation of, this report have been obtained from and are based on sources believed by us to be reliable and up to date, but no responsibility will be accepted for any error of fact or opinion.

To the extent permitted by law, the opinions, recommendations, assessments and conclusions contained in this report are expressed without any warranties of any kind, express or implied.

Synergies does not accept liability for any loss or damage including without limitation, compensatory, direct, indirect or consequential damages and claims of third parties, that may be caused directly or indirectly through the use of, reliance upon or interpretation of, the contents of the report.

## Contents

|           |                                                      |           |
|-----------|------------------------------------------------------|-----------|
| <b>1</b>  | <b>Introduction</b>                                  | <b>4</b>  |
| <b>2</b>  | <b>Background</b>                                    | <b>5</b>  |
| 2.1       | Cost benefit analysis and the ISP                    | 5         |
| 2.2       | Key requirements imposed on AEMO                     | 5         |
| 2.3       | Synergies' recommended 2022 ISP discount rates       | 6         |
| 2.4       | Financial market developments                        | 7         |
| <b>3</b>  | <b>Alternative discount rate updating approaches</b> | <b>8</b>  |
| 3.1       | Australian government agencies' discount rates       | 8         |
| 3.2       | Australian economic regulators                       | 8         |
| 3.3       | Hurdle rates for investment decision making          | 11        |
| 3.4       | Issues relevant for AEMO's discount rate updating    | 12        |
| 3.5       | Our recommended discount rate updating approach      | 15        |
| <b>4</b>  | <b>Application to 2024 ISP discount rate</b>         | <b>16</b> |
| <b>5</b>  | <b>Conclusion</b>                                    | <b>18</b> |
| 5.1       | Stage 1 update                                       | 18        |
| 5.2       | Stage 2 update                                       | 18        |
| 5.3       | Recommended discount rates for 2024 ISP              | 19        |
| <b>A.</b> | <b>2022 ISP discount rate assumptions</b>            | <b>20</b> |

## Figures and Tables

|         |                                                                              |    |
|---------|------------------------------------------------------------------------------|----|
| Table 1 | Discount rate estimates for lower, central and upper bounds (June 2022 data) | 16 |
| Table 2 | Discount rate estimates for lower, central and upper bounds                  | 20 |

## 1 Introduction

In 2021, AEMO received advice from Synergies Economic Consulting regarding the appropriate discount rates that should be applied in the cost-benefit analysis that underpins the 2022 Integrated System Plan (ISP). Three discount rates were provided: a central discount rate as well as a reasonable upper and lower bound which AEMO could use in its sensitivity analysis.

AEMO requires expert advice about how these three discount rates should be adjusted (if at all) based on economic developments over the past 18 months, most notably the increase in interest rates and inflation in the Australian economy.

AEMO is subject to discretionary guidance from the Australian Energy Regulator (AER) in using discount rates in its ISP cost benefit analysis, which we have considered in our report.

The discount rates arising from the updated advice in this report will inform AEMO's selection of appropriate discount rate(s) for use in the ISP cost benefit analysis process and will be consulted on with stakeholders through the Draft 2023 Inputs, Assumptions and Scenarios Report (IASR). Pending outcomes of that consultation, AEMO may adopt the updated advice for use in the Final 2023 IASR, extend the engagement with Synergies to refine the advice received from this scope of work, or look to develop alternative discount rates and methodologies in response to feedback received.

The remainder of this report is structured as follows:

- Section 2 provides background to the use of discount rates in the ISP cost benefit analysis.
- Section 3 discusses alternative discount rate updating approaches.
- Section 4 applies our preferred updating approach for the ISP discount rate.
- Section 5 concludes.
- Attachment A presents our discount rate range and assumptions used in the 2022 ISP cost benefit analysis.

## **2 Background**

Cost benefit analysis is a key input into the development of AEMO's ISP and in this regard AEMO must have regard to guidance from the AER in developing the discount rates that it uses.

### **2.1 Cost benefit analysis and the ISP**

The ISP is a whole-of-system plan that provides an integrated roadmap for the efficient development of the National Electricity Market (NEM) over the next 20 years and beyond.

This report relates to the delivery of expert advice to support AEMO in the development of appropriate upper, lower, and mid-range discount rates commensurate with a commercially orientated investment to be used for ISP projects. Given the methodology used in the ISP modelling the discount rate should be presented in the real pre-tax form.

The discount rate is used in the ISP as a means of comparing costs and benefits received at different points in time. In ISP modelling, AEMO traditionally uses the same discount rate as both the discount rate for cost and benefits (to calculate the net present value) and the Weighted Average Cost of Capital (WACC) for annualising capital costs for generation and transmission investments over the financial life.

### **2.2 Key requirements imposed on AEMO**

When developing the ISP discount rate, the AER has specified some requirements and some discretionary recommendations that AEMO must consider. These are specified in the AER's Cost Benefit Analysis (CBA Guideline) as set out below.

#### **2.2.1 Binding guidance**

Section 3.2.1 of the AER's CBA Guideline requires that the discount rate in the ISP is required to be appropriate for analysis of 'private investment in the electricity sector across the NEM'. To this end, the benchmark entity used to estimate the discount rate and WACC should be a private entity that is making investments in the NEM.

Further, the discount rate must be expressed as a real, pre-tax rate given ISP modelling is undertaken in real dollar terms.

### 2.2.2 Discretionary guidance

Outside of the AER's binding guidance, AEMO has flexibility in selecting the discount rate(s) for ISP development paths. Key aspects of the AER's discretionary guidance are that:

- the discount rate should reflect the systematic risk associated with expected cost and market benefit cash flow streams over the life of the projects in any assumed ISP development path;
- the lower bound discount rate should be the regulated cost of capital based on the AER's most recent regulatory determination at the time of the final ISP;
- the discount rate should not generally be used to manage uncertainty over predicted costs and benefits, with best practice suggesting that such uncertainty should be captured through sensitivity testing and scenario analysis;
- the choice of discount rate should promote competitive neutrality between network and non-network options in a development path.

## 2.3 Synergies' recommended 2022 ISP discount rates<sup>1</sup>

Synergies recommended central discount rate for AEMO's 2022 ISP was a WACC-based estimate reflecting an average investor view about required returns on investments in the NEM. It was estimated based on what is known as the social opportunity cost of capital, which recognises that any given investment may occur at the expense of alternative investments in the economy because capital is constrained but mobile. This is important in the context of the ISP given potential future Australian and international investors in the NEM will be selecting amongst a wide range of energy and non-energy investment opportunities across the world.

Hence, only future ISP-related investments that are assessed to provide a net social benefit should proceed because they would be consistent with achieving productive use of scarce resources (economic efficiency) and the National Electricity Objective, which focusses on efficient investment in, and efficient operation and use of, electricity services for the long term interests of electricity consumers.

To the extent that AEMO chose to apply rounding to our 2022 discount rate estimates, we recommended rounding to the nearest half per cent as follows:

---

<sup>1</sup> Synergies Economic Consulting, (2021), Discount rates for use in cost benefit analysis of AEMO's 2022 Integrated System Plan, July

- Lower bound – 2.0%
- Central case – 5.5%
- Upper bound – 7.5%.

The underlying assumptions for these discount rates are summarised in Attachment A of this report.

## **2.4 Financial market developments**

Since Synergies' original discount rate report was provided to AEMO in July 2021 there have been strong inflationary pressures emerging in the Australian economy and an associated sharp increase in Australian Government bond yields across the yield curve as the Reserve Bank of Australia increased the cash rate in response to higher inflation.

The effect of inflationary pressures and increasing government bond yields has also been reflected in increasing corporate debt risk premiums.

These increases in government and corporate bond yields, as well as inflation, have potentially important implications for the discount rates that AEMO will use in its next ISP cost benefit analysis. At a minimum, it requires a review of the appropriateness of the level of the 2022 ISP discount rate, as well as broader consideration of the basis of updating of this discount rate over time.

### **3 Alternative discount rate updating approaches**

There are several ways in which discount rates can be updated over time. However, it is important to understand the need for any such updating having regard to the use of discount rates in cost benefit analysis.

This section first summarises the different updating approaches for discount rates and WACC estimates used by Australian government agencies assessing infrastructure investments using cost benefit analysis and economic regulators making revenue/price determinations. In addition, we briefly review the evidence of private sector investment decision making. Drawing upon these approaches, it then identifies an updating approach that AEMO could apply over time in relation to the ISP discount rate.

#### **3.1 Australian government agencies' discount rates**

The five state and federal regulators highlighted in our original discount rate report for AEMO (Infrastructure Australia, Australian Government -Office of Best Practice Regulation (OBPR), Victorian Department of Treasury and Finance, NSW government, and Building Queensland,) have not updated their discount rates as of the time of preparing this report. Building Queensland has been absorbed back into the state department and has its discount rate assumptions published in the Business Case Development Framework for Queensland remains identical to the previous assessment.

In practice, this means that these government agencies continue to apply what has become over a long period the default 7% real pre-tax WACC with an upper bound of 10% and a lower bound of either 3% or 4%, which is being used for cost benefit analysis for major public infrastructure projects in Australia.

#### **3.2 Australian economic regulators**

Under Australian economic regulatory frameworks, there are a range of approaches applied to the updating of WACCs, including stand-alone methodology reviews and periodic updating made in the context of revenue/price determinations. Some economic regulators now also apply annual updating of the return on debt component of the WACC as part of a 10-year trailing average return on debt methodology.

##### **3.2.1 Stand-alone updates of WACC methodologies**

Several Australian economic regulators periodically review and update all aspects of their WACC methodologies outside of their revenue/price determination process.



The AER and WA Economic Regulation Authority (ERA) are required by law to adopt this approach. The Queensland Competition Authority (QCA) and Independent Pricing and Regulation Tribunal (IPART) are not obliged by law to do so but periodically undertake review of all aspects of their WACC methodologies.

#### *AER's Rate of Return Instrument (RoRI) – electricity and gas*

Under the National Electricity and Gas Laws, the AER is required to update its RoRI every four years. This updating entails a comprehensive review of all WACC input parameters.

These reviews require extensive stakeholder consultation, including a Consumer Reference Group, Investor Reference Group and Retailer Reference Group. An Independent Panel supports the AER to make the best possible instrument by reviewing the draft RoRI and the information available to the AER in drafting it.

Once finalised, the RoRI is 'locked in' and applied in all electricity and gas network revenue/price determinations in the subsequent four-year period. The current RoRI was finalised in 2018 and the AER is close to finalising its 2022 RoRI.<sup>2</sup>

Under the 2018 RoRI, as part of its trailing average return on debt methodology, the AER undertakes annual updates of the return on debt component of the WACC to reflect changes in market interest rates. Both the risk free rate and debt risk premium components of the return on debt are updated annually.

#### *ERA's Gas Rate of Return Instrument (Gas RoRI)*

The WA Economic Regulation Authority applies the National Gas Law to regulated WA gas network service providers and under this legislation is required to develop a Gas Rate of Return Instrument (the Gas RoRI) every four years.

Once finalised, the Gas RoRI is 'locked in' and applied in all ERA's gas network revenue/price determinations in the subsequent four-year period. Under the 2018 Gas RoRI, as part of its trailing average return on debt methodology, ERA undertakes annual updates of the debt risk premium during each regulatory period based on a 10-year trailing average (the risk free rate component of the return on debt is not updated annually).

Like for the AER's RoRI, ERA must fulfil certain consultation requirements to develop the Gas RoRI. This includes considering the advice, recommendations and/or submissions given by a Consumer Reference Group and Independent Panel.

---

<sup>2</sup> The AER recently decided to delay the publication of the 2022 RoRI until February 2023.

### *QCA's rate of return methodology*

The QCA periodically reviews all aspects of its rate of return methodology that is then applied across its water and transport revenue/price determinations. The QCA's last review was completed in 2021.

However, it updates financial and share market input parameters for contemporary market data when it applies the WACC in revenue/price determinations. Updating in the context of regulatory revenue/price determinations is discussed further in section 3.2.7 below

### *IPART's rate of return methodology and bi-annual updates*

IPART periodically reviews all aspects of its rate of return methodology that is then applied across its water and transport revenue/price determinations. IPART's last review was completed in 2018.

In addition, IPART also provides bi-annual updates in February and August of its WACC parameter values. Each bi-annual update is based on market data up to a specific date in the month preceding the update. IPART argues that publishing the bi-annual updates allows its stakeholders to better replicate and predict its WACC decisions. The following market parameters are updated bi-annually:

- risk free rate
- cost of debt
- (short run) market risk premium
- inflation.

However, for price determinations, IPART uses the latest available financial and equity market observations to estimate the gearing and equity beta parameters in the WACC.

### *Economic Regulation Authority*

In addition to the WACC used in gas revenue/price determinations was discussed in section 3.2.3 above, the ERA makes revenue and/or price determination in relation to several WA-based energy, water and transport utilities.

For electricity and water utilities, ERA undertakes a WACC review as part of making its periodic revenue/price determination for the relevant utility, discussed further in section 3.2.7 below.

For rail infrastructure providers, ERA is required to apply a somewhat different approach. Each year, the WA Railways Access Code requires ERA to determine the WACC to be applied in the determination of floor and ceiling cost prices for the three WA regulated rail networks. The annual reviews update for parameters that are referenced to market information (risk free rate, debt risk premium and inflation). Every five years the ERA consults on this determination as part of a thorough review of every WACC parameter.

ERA's most recent annual update was released on August 2022 underpinned by June 2022 market data.

### **3.2.2 Australian regulatory revenue/price determinations**

Australian economic regulators generally set three to five year revenue/price determination terms. These determinations are usually underpinned by use of a cost-based building block model to determine allowable revenue and/or prices. A key component of the building block model is the return on capital allowance which is a function of the regulatory asset base (plus capex) and the WACC.

As part of these periodic revenue/price determinations, economic regulators undertake a review of the WACC proposed by the regulated entity and decides whether to accept or substitute an alternative WACC estimate to determine allowable revenues/prices.

The Essential Services Commission of Victoria (ESC) and Essential Services Commission of South Australia (ESCOSA) generally adopt this approach.

Essentially, these reviews set a WACC by reference to either:

- applying the WACC methodology formally set out in the guidance outlined above, which in turn allows for relevant parameters (risk free rate, debt risk premium and inflation, and depending on the approach taken, the market risk premium) to be updated for the decision
- developing a WACC by reference to market information for relevant parameters together with a decision-by-decision review of methodology. Whilst a regulator may change its methodology for the setting of WACC from decision to decision, there tends to be a reasonably high degree of consistency in each regulator's approach over time.

## **3.3 Hurdle rates for investment decision making**

Various surveys have been undertaken of private businesses' decision making in relation to investments – the so-called hurdle rate of return is not updated to account for changes

in interest rates (or similar parameters, such as the debt risk premium). Lane and Rosewell (from the RBA Economics Department) report findings from the RBA's liaison program:<sup>3</sup>

...liaison contacts also report that hurdle rates are not changed very often and, in some, instances have not been altered for at least several years. These observations are also reflected in the recent survey by Deloitte; two-thirds of corporations indicated their hurdle rate was updated less frequently than their formal review of the WACC, and nearly half reported the level of their hurdle rate was changed 'very rarely'...

The authors go on to observe:<sup>4</sup>

Liaison contacts have provided several reasons why the hurdle rate may not be sensitive to the cost of capital. A common observation is that the true cost of equity, and therefore the overall cost of capital, cannot be observed. Managers have also noted that changes in the observed cost of debt owing to changes in interest rates are likely to be temporary, and so they are reluctant to react to developments that may soon be unwound. A few business contacts have argued that keeping the hurdle rate constant acts as an automatic time-varying risk adjustment: interest rates tend to be low when uncertainty is high, so the gap between the hurdle rate and the cost of capital should be higher (and vice versa).

Whilst it can be reasonably be expected that contemporary market conditions, particularly the risk free rate and debt risk premium, will influence capital budgets and investment decisions by businesses, contemporary market conditions do not directly inform hurdle rates used by businesses.

### **3.4 Issues relevant for AEMO's discount rate updating**

The ISP is developed as part of AEMO meeting its responsibilities as National Transmission Planner under National Electricity Law, specifically to prepare, maintain and publish a plan for the development of the national transmission grid, the National Transmission Network Development Plan. The first ISP was released in 2018 and it is updated every two years.

---

<sup>3</sup> Lane, K. & Rosewall, T. (2015). Firms' investment decisions and interest rates, RBA Bulletin, June quarter 2015, p3. The precise number of practitioners interviewed is not disclosed, but the article states that the business liaison team conducts around 70-80 discussions with contacts on a monthly basis and that discussions with individual firms occur around every 6 to 12 months.

<sup>4</sup> Ibid, p4

This biennial updating of the ISP, as well as its underlying input assumptions, is relevant to the frequency of updating of the discount rate used in the cost benefit analysis applied in relation to it and is discussed further in this section of our report.<sup>5</sup>

### **3.4.1 Stability vs “on the day precision” trade-off**

Balancing stability and “on the day precision” (that is, a discount rate reflecting the precise market conditions prevailing on the day of the decision) when establishing the level of discount rates is the key consideration in deciding how often they should be updated.

When applying a social opportunity cost discount rate, as is the case for the ISP discount rate, it must be cognisant of the current opportunity cost of capital given prevailing financial and share market conditions.

There are several implications of not updating the discount rate in line with changing financial and share market conditions. Most importantly, a discount rate that does not reflect underlying conditions will misrepresent the opportunity cost of capital such that some projects will be assessed as not worth pursuing (or worth pursuing) when they would be assessed as worthwhile (not worthwhile) under a discount rate that better reflects underlying opportunity costs.

Similarly, applying discount rates that do not reflect underlying conditions and opportunity costs will distort the ranking of potential projects. Projects with longer lives may be assigned a lower priority than would have been the case with a lower discount rate. Projects with deferred benefits are usually the most disadvantaged by a higher discount rate. This is of specific relevance to the ISP, where large amounts of investment are required to deliver benefits that will accrue to electricity consumers in the long term.

However, in recognising a need for the discount rate to reflect changing financial and share market conditions over time, there is a benefit in maintaining stability in discount rates such that longer term decision making is unaffected by market perturbations. This clearly reflects the decision making of businesses assessing opportunity cost for their business (which is a different issue to the social opportunity cost, the key parameter for the ISP). The benefit of stability stems from applying a broadly similar discount rates to projects that are effectively competing for the same finite pool of resources in the economy with associated opportunity costs arising from project selection.

---

<sup>5</sup> Key inputs and assumptions for the ISP are published by AEMO at least biennially as part of its Inputs, Assumptions and Scenarios Report (IASR). The most recent IASR, used to prepare the 2022 ISP, is the 2021 IASR.

### **3.4.2 What discount rate parameters should be updated and how frequently?**

In recognising changing financial and share market conditions, this does not necessarily mean that all input parameters need to be updated frequently. Clearly, some discount rate input parameters are likely to move more frequently than others, such as the government long term bond yield (risk free rate), but this may also reflect ‘noise’ and inherent volatility rather than material changes in market expectations or economic conditions that should be captured in the discount rate.

The role and timing of updating the ISP provides a different context compared to the regulatory and government agency approaches to discount rate/WACC updating, as well as private sector investment decision making, discussed in section 3.2. The role of the ISP and its associated cost benefit analysis is as an evolving national transmission plan rather than as an individual major proposed infrastructure project requiring a cost benefit analysis, or a discrete periodic revenue/price determination. The ISP is capturing very many potential future electricity infrastructure investments in a rapidly transforming National Electricity Market (NEM).

There is good reason for CBA frameworks to prioritise stability over “on the day precision”. First, the very process of rounding (which we support) reflects the inherent imprecision of the process. Excessive volatility in the discount rate will alter the ranking of projects (back and forth over time in line with variations in the discount rate) and undermine the objectives of the ISP.

Hence, “on the day precision” is a factor to which AEMO should have regard in the context of ensuring that the discount rate is reflective of current market conditions rather than exclusively driving the discount rate. Accordingly, we do not recommend deterministically updating the ISP discount rate at set future dates.

Rather, there is merit in applying an intermediate step for assessing whether there is sufficient movement in the market parameters subject to change with each ISP update. Given the use of rounding in setting ISP discount rates, this intermediate step would ensure that only material changes in market parameters are captured. The sharp increase in nominal interest rates and inflation since the 2022 ISP was finalised is an important example where such updating would be justified.

If the ISP continues to be updated biennially as we expect, there is a case for a more thorough review being conducted less frequently, say every three cycles (six years), involving a more detailed analysis of all discount rate input parameters (including beta, gamma and gearing), recognising the speed of change in the NEM and scale of future transmission and generation investments being captured in the ISP.

### **3.5 Our recommended discount rate updating approach**

We recommend a two-stage process to updating the discount rate for each biennial review as part of the ISP and associated IASR updating process:

- First, assess whether changes in market conditions justify a change in the discount rate based on a material change in relevant parameters (principally the risk free rate)
- Then, only if the review finds a material change in the risk free rate, update all relevant parameters influenced by it in the discount rate assessment (risk free rate, debt risk premium, market risk premium and inflation).

Additionally, less frequent reviews of all parameters informing the cost of capital assessment, similar to the process AEMO undertook in 2021, is also appropriate.

Applying the above updating approach, we consider that more frequently capturing any material and sustained changes in the government long term bond yield (risk free rate) and inflation (recognising that the discount rate is a real pre-tax (inflation adjusted) WACC) is likely to be most important for the ISP discount rate. There is merit in considering updating these input parameters should be every two years in line with the ISP update cycle.

Similarly, if a biennial review finds sufficient movement in these parameters, the debt risk component of the return on debt and the market risk premium component of the return on equity are likely to require updating on a consistent basis with the risk free rate and inflation. This would be justified by the fact that corporate bond yields are generally expressed as a spread (difference) in relation to government bond yields. Similarly, as we discussed at length in our original discount rate report, expert commentary in Australia highlights that it is imperative to consider the relationship between the market risk premium, the risk-free rate and the return on equity.

In contrast, material sustained changes in a discount rate input parameter such as gearing is likely to occur less frequently. While equity and asset betas can be quite volatile over short periods, they too are more stable when observed over longer periods. Further, estimating any such changes to these input parameters is subject to greater judgement than observing reported government bond yield and inflation data. The frequency of updating of these other input parameters can more reasonably be done less frequently (say, every six years) without compromising discount rate estimation.

This approach to more frequently update several more highly sensitive input parameters with longer term 'deeper dives' of all input parameters provides a reasonable balance between the "on the day precision" and stability objectives in updating the ISP discount rate having regard to the dynamic role of the ISP.

## 4 Application to 2024 ISP discount rate

This section applies the discount rate updating approach outlined in section 3.4 of our report, which means updating the following ISP discount rate input parameters up to June 2022 for the central and upper bound estimates:

- 10-year government bond yield (risk free rate)
- market risk premium
- debt risk premium
- inflation.

Our lower bound WACC estimate is based on the AER’s Transgrid and Electranet Draft Decisions, both released in September 2022 and which are also based on June 2022 data.<sup>6</sup>

Table 1 presents our updated discount rates.

**Table 1 Discount rate estimates for lower, central and upper bounds (June 2022 data)**

| Parameter                                                                               | Lower bound estimate (AER determinations) | Central estimate | Upper bound estimate |
|-----------------------------------------------------------------------------------------|-------------------------------------------|------------------|----------------------|
| Risk-free rate                                                                          | 3.82%                                     | 3.82%            | 3.82%                |
| Capital structure                                                                       | 60%                                       | 50%              | 50%                  |
| Gamma                                                                                   | 0.585                                     | 0.25             | 0.00                 |
| Corporate tax rate                                                                      | 30%                                       | 30%              | 30%                  |
|                                                                                         |                                           |                  |                      |
| <b>CAPM Parameters</b>                                                                  |                                           |                  |                      |
| Market risk premium (MRP)                                                               | 6.10%                                     | 7.13%            | 6.99%                |
| Asset beta                                                                              | 0.24                                      | 0.50             | 0.60                 |
| Equity beta                                                                             | 0.6                                       | 1.00             | 1.20                 |
| SL CAPM return on equity                                                                | 7.48%                                     | 10.95%           | 12.21%               |
| <b>Debt Parameters</b>                                                                  |                                           |                  |                      |
| Debt beta                                                                               | 0.00                                      | 0.00             | 0.00                 |
| Debt risk premium (BBB+ rating for lower bound; BBB rating for central and upper bound) | 2.47%                                     | 2.58%            | 2.58%                |
| Debt raising costs                                                                      | 0.10%                                     | 0.10%            | 0.10%                |
| Return on debt (nominal, pre-tax)                                                       | 6.39%                                     | 6.50%            | 6.50%                |
|                                                                                         |                                           |                  |                      |

<sup>6</sup> AER (2022), Transgrid Transmission Determination 2023 to 2028 (1 July 2023 to 30 June 2028), Draft Decision, Attachment 3, Rate of Return, September.  
AER (2022), Electranet, Transmission Determination 2023 to 2028 (1 July 2023 to 30 June 2028), Draft Decision, Attachment 3, Rate of Return, September



| Parameter                     | Lower bound estimate<br>(AER determinations) | Central estimate | Upper bound estimate |
|-------------------------------|----------------------------------------------|------------------|----------------------|
| Inflation                     | 3.00%                                        | 2.96%            | 2.96%                |
| Post-tax nominal vanilla WACC | 6.82%                                        | 8.73%            | 9.35%                |
| Pre-tax real WACC             | 4.13%                                        | 7.14%            | 8.75%                |

**Note:** The AER's latest WACC decisions have been adjusted to reflect an on-the-day cost of debt calculation.

**Source:** Various AEMO and AER publicly available documentation

Our updated discount rate range has been developed in accordance with the AER's binding and discretionary guidance.

## 5 Conclusion

Synergies' previous advice to AEMO on the discount rate for the ISP was completed at a time of historically low risk free rates and inflation. Since then, strong inflationary pressures have emerged which have increased inflationary expectations, risk free rates, as well as corporate debt risk premiums significantly.

Whilst fluctuations in these parameters do not necessarily warrant changes to the discount rate for the ISP, on this occasion the increases are sufficiently large to warrant AEMO's review.

This report updates the discount rate for the upcoming ISP and proposes a two-stage approach for reviewing and if necessary adjusting AEMO's ISP discount rate over time having regard to the purpose of the ISP under AEMO's role as National Transmission Planner in the NEM.

### 5.1 Stage 1 update

The following input parameters will be updated every two years in alignment with the ISP biennial updates only if an initial review suggests that a sufficiently material change in the risk free rate warrants a review of the discount rate:

- Long term government bond yield (risk free rate)
- Market risk premium
- Debt risk premium
- Inflation.

### 5.2 Stage 2 update

All input parameters will be subject to detailed review and updating every six years including the following input parameters not subject to Stage 1 updating:

- Asset and equity betas
- Gearing
- Gamma.

### 5.3 Recommended discount rates for 2024 ISP

To the extent that AEMO chooses to apply rounding to our discount rate estimates, we recommend the following lower, central and upper discount rates to be used in the 2024 ISP cost benefit analysis:

- Lower bound – 4.0%
- Central case – 7.0%
- Upper bound – 9.0%

The key updated input parameter assumptions underpinning our central and upper bound discount rates based on market data reported at 30 June 2022 are as follows:

- Risk free rate is based on 10-year Commonwealth bond (3.82% based on a 20-day average).
- Debt risk premium assumes a BBB credit rating (2.58% based on a 20-day average).
- Market risk premium (MRP) (7.13% for a gamma of 0.25 and 6.99% for a gamma of zero) is based on an average of the Wright and Ibbotson backward-looking approaches.<sup>7</sup>
- Inflation (2.96%) is based on the ‘breakeven’ method applying the Fisher equation to the difference between nominal and real (inflation-indexed) long-term government bond yields.

---

<sup>7</sup> The MRP estimate of 7.13% compares to the 8.20% estimate used in the 2022 ISP central and upper discount rates. This reduction arises because the large increase in the risk free rate since the release of the 2022 ISP reduces the MRP due to the 50% weighting ascribed to the Wright MRP approach in our MRP calculation. The Wright approach assumes that the real required equity return is constant over time so that the MRP varies inversely with changes in the risk-free rate.

## A. 2022 ISP discount rate assumptions

Table 2 presents our original recommended discount rate range.

**Table 2 Discount rate estimates for lower, central and upper bounds**

| Parameter                                                                               | Lower bound estimate (AER) | Central estimate | Upper bound estimate |
|-----------------------------------------------------------------------------------------|----------------------------|------------------|----------------------|
| Risk-free rate                                                                          | 1.63%                      | 1.63%            | 1.63%                |
| Capital structure                                                                       | 60%                        | 50%              | 50%                  |
| Gamma                                                                                   | 0.585                      | 0.25             | 0.00                 |
| Corporate tax rate                                                                      | 30%                        | 30%              | 30%                  |
| <b>CAPM Parameters</b>                                                                  |                            |                  |                      |
| Market risk premium (MRP)                                                               | 6.10%                      | 8.20%            | 8.10%                |
| Asset beta                                                                              | 0.24                       | 0.50             | 0.60                 |
| Equity beta                                                                             | 0.6                        | 1.00             | 1.20                 |
| SL CAPM return on equity                                                                | 5.29%                      | 9.83%            | 11.35%               |
| <b>Debt Parameters</b>                                                                  |                            |                  |                      |
| Debt beta                                                                               | 0.00                       | 0.00             | 0.00                 |
| Debt risk premium (BBB+ rating for lower bound; BBB rating for central and upper bound) | 1.28%                      | 1.45%            | 1.45%                |
| Debt raising costs                                                                      | 0.10%                      | 0.10%            | 0.10%                |
| Return on debt (pre-tax)                                                                | 3.01%                      | 3.18%            | 3.18%                |
| <b>Inflation</b>                                                                        |                            |                  |                      |
|                                                                                         | 2.00%                      | 2.23%            | 2.23%                |
| <b>Post-tax nominal vanilla WACC</b>                                                    | <b>3.92%</b>               | <b>6.51%</b>     | <b>7.27%</b>         |
| <b>Pre-tax real WACC</b>                                                                | <b>2.18%</b>               | <b>5.58%</b>     | <b>7.30%</b>         |

**Note:** The AER's latest WACC decisions have been adjusted to reflect an on-the-day cost of debt calculation

**Source:** Various AEMO and AER publicly available documentation

### A.1 Key assumptions

The key assumptions underpinning our central discount rate were as follows:

- Risk free rate is based on 10-year Commonwealth bond (1.63% at 31 May 2021 based on a 20-day average).
- Debt risk premium assumes a BBB credit rating (1.45% at 31 May 2021 based on a 20-day average).
- Market risk premium (MRP) (8.2% for a gamma of 0.25) is based on an average of the Wright and Ibbotson backward-looking approaches (the volatility of the

forward-looking Dividend Discount Model approach means it has been used as a cross check only).

- Asset beta of 0.50 (based on an average asset beta of our domestic and international sample of 42 Electric Utilities, 9 Independent Power Producers & Energy Traders and 19 Renewable Electricity listed entities sourced from the Global Industry Classification Standard, which is a globally recognised classification system).<sup>8</sup>
- Capital structure based on gearing level of 50% using the same sample as for our asset beta calculation.
- Equity beta of 1.00 (based on our asset beta of 0.50, gearing of 50%, and the Brealey-Myers formula to de-lever and re-lever the equity beta estimates to standardise the gearing ratio across the sample).
- Forward-looking cost of debt based on BBB credit rating (3.18% at 31 May 2021 including debt risk premium of 1.45% noted above).
- Gamma of 0.25 informed by reference to dividend drop-off studies, which estimate the value of distributed imputation tax credits (theta) by observing the change in stock prices when the dividend and imputation credit separate from the share. This value aligns with IPART's current estimate of gamma.<sup>9</sup>
- Inflation of 2.23% based on the differential of yields between nominal and indexed Treasury bonds ('the break-even method').
- Australian statutory tax rate of 30%.

Our upper bound estimate is based on the same parameters as the central estimate, except for:

- Market risk premium (8.1% for a gamma of 0), based on the same averaging approach as used for the central estimate but adjusted to recognise that the marginal investor is foreign and gains no tax benefit from the dividend component of the excess return on the market.
- Asset beta of 0.60 (based on the 75<sup>th</sup> percentile asset beta asset beta of our sample and specifically referable to renewable generators).

---

<sup>8</sup> Consistent with the practice of financial practitioners and most Australian economic regulators (except for the QCA), we assume a debt beta of zero.

<sup>9</sup> IPART (2018), Review of our WACC Method, (February), pp 75-83

- Equity beta of 1.20 (based on an asset beta of 0.60, gearing of 50%, and applying the Brealey-Myers formula).
- Gamma of zero reflecting an assumption that the marginal investor in the NEM is an international investor who gains no benefit from franking tax credits.

In accordance with the AER's CBA Guidelines, our lower bound estimate was a simple average of the AER's most recent regulatory determinations for the Victorian distribution network service providers (all released on 30 April 2021) and AusNet Services transmission network (released on 30 June 2021).

In presenting our discount rate assumptions, we noted that several were not the same as those in the AER's 2018 Rate of Return Instrument and reflected in its recent regulatory determinations and the lower bound discount rate presented above. However, we noted that the AER's CBA Guidelines are not prescriptive regarding the cost of capital methodology that we use to calculate the central and upper bound discount rates. Rather, the key requirement is that our estimates reflect a discount rate consistent with private sector investments in the NEM, which we considered that they did.