

Cost Benefit Analysis Guidelines Compliance Report

July 2024

For the 2024 Integrated System Plan





Important notice

Purpose

AEMO provides the Cost Benefit Analysis Guidelines Compliance Report to the Australian Energy Regulator (AER) as required in section 2.1.2 of the Cost Benefit Analysis Guidelines.

This report is based on information available to AEMO at 26 June 2024 unless otherwise indicated.

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Version control

| Version | Release date | Changes |
|---------|--------------|------------------|
| 1 | 24/7/2024 | Initial release. |



Executive summary

Cost Benefit Analysis Guidelines obligations for the Integrated System Plan

The Australian Energy Regulator's (AER's) Cost Benefit Analysis Guidelines (CBA Guidelines) describe the analysis that AEMO must undertake in the *Integrated System Plan* (ISP) and that transmission network service providers (TNSPs) must undertake in regulatory investment tests for transmission (RIT-T).

For the ISP, the CBA Guidelines provide binding and non-binding guidance for AEMO in preparing an ISP. The CBA Guidelines classify these elements as either:

- **Requirements** – binding regulatory obligations with which AEMO must comply.
- **Considerations** – matters which AEMO must have regard to but may form its own view on how much weight (if any) to give when making a decision. Considerations are binding.
- **Discretionary** – information that is not specified as a requirement or consideration and is non-binding.

This CBA Guidelines Compliance Report (the "Compliance Report") outlines AEMO's compliance with all requirements and considerations in the CBA Guidelines relating to the development of the 2024 ISP.

AEMO considers the 2024 ISP complies with the relevant regulatory obligations

After reviewing the processes used to develop the 2024 ISP, AEMO considers it has complied with the binding requirements and considerations of the CBA Guidelines.

In addition, with the benefit of regular engagement between the AER and AEMO on ISP activities, the AER has not listed any ISP compliance issues on its compliance issues register. AEMO will continue to work closely with the AER to promote compliance in future ISPs, proactively address potential compliance issues and resolve any uncertainty regarding the application of compliance obligations.

AER guideline compliance reporting

Separately, the AER's Forecasting Best Practice Guidelines (FBPG) require AEMO to provide a compliance report to the AER shortly after publishing an *Inputs, Assumptions and Scenarios Report* (IASR) or *ISP Methodology*. The FBPG include obligations relevant to AEMO's forecasting practices and consultation processes for the ISP.

In August 2023, AEMO provided the AER with a single compliance report that addressed FBPG obligations relevant to both the 2023 IASR and ISP Methodology.

AEMO currently expects to publish the 2025 IASR and complete a review of the ISP Methodology before mid-2025. A compliance report addressing FBPG obligations relevant to the IASR and ISP Methodology, including reporting on any other relevant FBPG obligations since the previous compliance report, will be provided to the AER shortly thereafter.

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1 Introduction

AEMO is required to provide the Australian Energy Regulator (AER) with a *Compliance Report* for the *Integrated System Plan* (ISP), which must be submitted to the AER no later than 20 business days after the publication of the final ISP.

The Cost Benefit Analysis Guidelines (CBA Guidelines)¹ specify which parts of the guideline are binding *requirements* on AEMO, and which are binding *considerations*:

- ‘Binding *requirements*’ are those which must be addressed by AEMO, and
- ‘Binding *considerations*’ are those which AEMO must have regard to or must consider when making decisions.

This *Compliance Report* is required to identify where AEMO has:

- complied with applicable requirements;
- had regard to applicable considerations (including the reasons for the weight AEMO has attached to each consideration); and
- resolved key issues raised by the AER through the AER’s compliance issues register².

1.1 Scope of this report

This *Compliance Report* demonstrates AEMO’s assessment of compliance with the binding requirements and considerations of the CBA Guidelines (version 2.0) relevant to the development of the 2024 ISP. The 2024 ISP³ was published on 26 June 2024.

The AER amended the CBA Guidelines within the period of development of the 2024 ISP⁴. As such, AEMO applied a previous version of the CBA Guidelines, version 1.0, when considering obligations that related to the update to the *ISP Methodology* and the *2023 Inputs, Assumptions and Scenarios Report* (IASR), published in June and July 2023 respectively. Importantly, however, versions 1.0 and 2.0 included identical binding requirements and considerations, so AEMO considers that the full development of the 2024 ISP is in compliance with the binding requirements and considerations of version 2.0.

The AER has published an approach for identifying and assessing ISP compliance issues through the AER compliance issues register. No ISP compliance issues have been identified by the AER to date.

Figure 1 below provides a summary of the ISP and regulatory investment test for transmission (RIT-T) cost benefit analysis (CBA) processes, and the relevant sections of the CBA Guidelines relating to each step, including the ISP.

¹ AER. Cost Benefit Analysis Guidelines, version 2.0, October 2023. At <https://www.aer.gov.au/industry/registers/resources/reviews/review-cost-benefit-analysis-and-regulatory-investment-test-guidelines>.

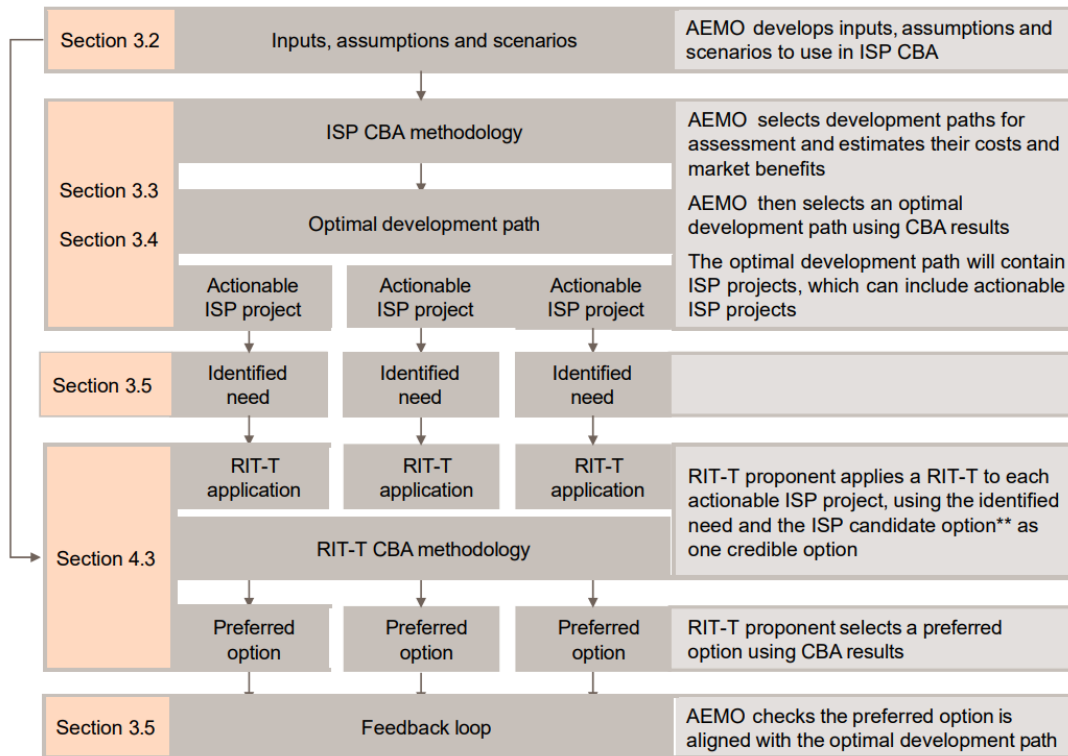
² AER. ISP and RIT-T Compliance Issues Register. At <https://www.aer.gov.au/wholesale-markets/compliance-issues-register-isp-actionable-rit-ts>.

³ AEMO. 2024 Integrated System Plan, June 2024. At <https://aemo.com.au/energy-systems/major-publications/integrated-system-plan-isp/2024-integrated-system-plan-isp>.

⁴ AEMC. “Material Change in Network Infrastructure Project Costs” – National Electricity Amendment Rule. At <https://www.aemc.gov.au/rule-changes/material-change-network-infrastructure-project-costs>. AEMC. Transmission Planning and Investment Review – Stage 2 Final Report. At <https://www.aemc.gov.au/market-reviews-advice/transmission-planning-and-investment-review>.

This *Compliance Report* focuses on compliance related to elements of Figure 1 linked to section 3 of the CBA Guidelines, which relate to the ISP, IASR, *ISP Methodology* and the feedback loop.

Figure 1 CBA guidelines alongside the ISP and RIT-T CBA processes



Source: AER, CBA Guidelines, Figure 2, p.13.

1.2 Structure of this report

CBA Guidelines Appendix A, Table 13 lists the binding requirements and considerations when developing the ISP. For ease of reporting and assessing compliance, Section 2 of this report is structured according to the list of binding requirements and considerations contained in CBA Guidelines Appendix A:

- Section 2.1 summarises compliance issues relating to the CBA Guidelines.
- Section 2.2 addresses requirements and considerations 1-4 relating to compliance reporting contained in section 2.1 of the CBA Guidelines.
- Section 2.3 addresses requirements and considerations 5-11 relating to inputs, assumptions and scenarios contained in section 3.2 of the CBA Guidelines.
- Section 2.4 addresses requirements and considerations 12-23 relating to the CBA methodology contained in section 3.3 of the CBA Guidelines.
- Section 2.5 addresses requirements and considerations 24-28, relating to treatment of externalities, option value and non-network options contained in section 3.4 of the CBA Guidelines.
- Section 2.6 addresses requirements and considerations 29-35, relating to interactions and alignment with the RIT-T contained in section 3.5 of the CBA Guidelines.

2 Compliance with requirements and considerations

This section presents AEMO's assessment of compliance with the requirements and considerations set out in the CBA Guidelines relevant to the 2024 ISP.

2.1 Compliance issues

After reviewing the processes used to develop the 2024 ISP, AEMO considers it has complied with the binding requirements and considerations of the CBA Guidelines. As detailed in subsequent sections, no compliance issues have been identified.

2.2 Compliance reporting

This section discusses compliance with the CBA Guidelines binding requirements and considerations relating to compliance reporting as summarised in Appendix A, Table 13 of the guidelines.

Table 1 CBA Guidelines Section 2.1 – Complying with the CBA Guidelines

| # | CBA Guidelines requirement/consideration | AEMO compliance | |
|---|--|---|--|
| 1 | Requirement: AEMO is <i>required</i> to provide the AER with a compliance report when preparing an ISP, which must be submitted to the AER no later than 20 business days after the publication of the final ISP. | This report achieves compliance with this requirement. | |
| 2 | Requirement: In its compliance reports, AEMO is <i>required</i> to identify where it: | <ul style="list-style-type: none"> has complied with applicable requirements; | Compliance with binding obligations identified as " Requirements " are discussed in sections 2.2 – 2.6 of this report. |
| | | <ul style="list-style-type: none"> has had regard to applicable considerations (including the reasons for the weight it has attached to each consideration); and | Compliance with binding considerations identified as " Considerations " are discussed in sections 2.2 – 2.6 of this report. |
| | | <ul style="list-style-type: none"> has resolved key issues raised by the AER through the issues register. | No key issues have been raised by the AER through the issues register. |
| 3 | Requirement: AEMO is <i>required</i> to identify breaches of the CBA guidelines, if any, in its compliance reports and provide an explanation for the breach. | AEMO has not identified any breaches of the CBA Guidelines in this compliance report. | |
| 4 | Requirement: If a compliance report contains confidential information, AEMO is <i>required</i> to provide another non-confidential version of the report in a form suitable for publication. | No confidential information is contained in this report. | |

2.3 Inputs, assumptions and scenarios

This section discusses AEMO's compliance with the CBA Guidelines binding requirements and considerations relating to inputs, assumptions and scenarios, as summarised in Appendix A, Table 13 of the guidelines.

Table 2 CBA Guidelines Section 3.2.1 – Inputs and assumptions

| # | CBA Guidelines requirement/consideration | AEMO compliance |
|---|--|--|
| 5 | <p>Requirement: AEMO is required to:</p> <ul style="list-style-type: none"> Identify the key inputs or assumptions driving the CBA results in the draft ISP. These have a large impact on the costs or market benefits of one or more development paths. | <p>Key inputs and assumptions driving the CBA results in the Draft 2024 ISP are discussed extensively within Appendix 6 of the Draft 2024 ISP. High-level key inputs for the Draft 2024 ISP are:</p> <ol style="list-style-type: none"> the application of stronger emission reduction policies a refined scenario set that reflects significant expansions in commitment to net zero faster forecast take up of consumer energy resources, and higher costs for transmission, generation and storage. <p>The 2024 ISP, including the updated Appendix 6 to the final 2024 ISP, also describes key changes since the publication of the Draft 2024 ISP in response to stakeholder feedback, policy and legislative changes and recent market developments.</p> |
| | <ul style="list-style-type: none"> Where available, present verifiable sources for each key input and assumption, and their associated forecasting methodologies, in the draft ISP. | <p>The 2023 IASR⁵, which is published as a part of the 2024 ISP process, presented verifiable sources (where available) for each key input and assumption used in the Draft 2024 ISP modelling. The AER’s transparency review requires it to assess whether, when selecting key inputs and assumptions, AEMO has based information on verifiable sources or provided stakeholders with adequate opportunity to propose alternative inputs. The AER’s 2023 IASR Transparency Review Report⁶ found that “the majority of AEMO’s inputs and assumptions [in the IASR] have been adequately explained and AEMO has demonstrated that it has taken into account stakeholder feedback.” Aspects of the 2023 IASR that the AER considered required further explanation were addressed in the 2023 IASR addendum published 15 December 2023.</p> |
| 6 | <p>Consideration: AEMO must have regard to the performance of its previous forecasts against actual outcomes, through the post-period performance reviews set out in the forecasting best practice guidelines.</p> | <p>AEMO had regard to the performance of its previous forecasts against actual outcomes when developing the 2023 IASR⁵, as measured in AEMO’s annual Forecasting Accuracy Report (FAR)⁷. AEMO uses the results from and insights gained from its FAR to develop annual Forecast Improvement Plans (included within the same FAR) to continuously improve its forecasts. The 2023 FAR summarised that the most recently assessed forecasts (for the 2022 <i>Electricity Statement of Opportunities</i> (ESOO)) provided good overall performance, with inaccuracies largely explainable by the influence of weather conditions and other model inputs. It identified several potential improvements that were subsequently consulted on, and will influence future forecasting.</p> |
| 7 | <p>Requirement: The discount rate(s) in the ISP is required to be appropriate for the analysis of private enterprise investment in the electricity sector across the National Electricity Market, and is required to be consistent with the cash flows that the ISP is discounting.</p> | <p>Section 3.7.1 of the 2023 IASR sets out the discount rate applied in the 2024 ISP. AEMO engaged Synergies Economic Consulting to update the discount rate assumptions provided to AEMO for the 2022 ISP. Synergies’ report⁸ included a WACC-based estimate reflecting an average investor view about required return on investments in the NEM, consistent with the CBA Guidelines.</p> <p>Following stakeholder feedback on the Draft 2023 IASR, AEMO engaged Oxford Economics Australia (OEA) to survey developers in the NEM regarding their cost of capital to gather additional input, including evidence on the suitability of Synergies’ discount rates that were included in the Draft 2023 IASR. OEA found that there was anecdotal and empirical evidence that suggest that the central discount rate estimated by Synergies was reasonable and similar to those faced by developers in the NEM.</p> |

⁵ At <https://aemo.com.au/en/energy-systems/major-publications/integrated-system-plan-isp/2024-integrated-system-plan-isp/current-inputs-assumptions-and-scenarios>.

⁶ At <https://www.aer.gov.au/publications/reports/performance/transparency-review-aemo-2023-inputs-assumptions-and-scenarios-report>.

⁷ At <https://aemo.com.au/en/energy-systems/electricity/national-electricity-market-nem/nem-forecasting-and-planning/forecasting-and-reliability/forecasting-accuracy-reporting>.

⁸ Synergies. *Updating the 2022 ISP Discount Rate*, December 2022. At https://aemo.com.au/-/media/files/stakeholder_consultation/consultations/nem-consultations/2022/2023-inputs-assumptions-and-scenarios-consultation/supporting-materials-for-2023/synergies-updating-the-2022-discount-rate.pdf?la=en.

| # | CBA Guidelines requirement/consideration | AEMO compliance |
|---|--|--|
| | | AEMO based the lower bound discount rate on the most recent AER revenue determination at the time the 2023 IASR was released (Final decision: Transgrid transmission determination 1 July 2023 to 30 June 2028) ⁹ , consistent with discretionary guidance in the CBA Guidelines. Further details on discount rates and the assumptions that underpin the values can be found in the Synergies report. |
| 8 | <p>Requirement: When applying a value(s) of customer reliability (VCR) to value a market benefit class for a development path, AEMO is required to use:</p> <ul style="list-style-type: none"> The AER's most recent VCRs for unplanned electricity outages for the NEM, at the time of publishing an ISP timetable under clause 5.22.4 of the National Electricity Rules (NER); and The most relevant VCR(s) for the load associated with the unplanned electricity outages. | Section 3.7.2 of the 2023 IASR sets out the VCRs applied in the 2024 ISP. In accordance with the CBA Guidelines, AEMO is required to use the AER's most recent VCRs at the time of publishing the ISP Timetable. The AER releases annual updates to its VCRs based on the Consumer Price Index for that year, with the most recent adjustment prior to the 2023 IASR being made in December 2022. AEMO has applied these adjustments to the customer load-weighted state VCRs that were published by the AER in December 2019, and in turn applied these VCRs in the CBA for the 2024 ISP. |
| 9 | <p>Consideration: When applying a VCR, AEMO must have regard to:</p> <ul style="list-style-type: none"> Any application guidance accompanying the VCR values it is using; and | Based on stakeholder feedback on VCRs in response to the Draft 2023 IASR and in accordance with application guidance, AEMO applied the customer load-weighted state VCRs provided in the AER's report when finalising the 2023 IASR. |
| | <ul style="list-style-type: none"> The load-weighted VCR that reflects the relevant composition of the different customer types in the specified loads that feature higher up on that jurisdiction's schedule of rotational load shedding. | Customer load-weighted state VCRs were adopted as they reflect the VCRs of the customer composition on the network as per the guidance provided in AER's VCR report. |

Table 3 CBA Guidelines Section 3.2.2 – Scenarios

| # | CBA Guidelines requirement/consideration | AEMO compliance |
|----|---|---|
| 10 | <p>Consideration: In developing reasonable scenarios, AEMO must consider:</p> <ul style="list-style-type: none"> The key inputs identified in section 3.2.1 and major sectoral uncertainties affecting the costs, benefits and need for investment in the NEM, when selecting the input variables and parameters that form part of each scenario. | <p>Table 4 of the 2023 IASR identifies the key scenario parameters and each parameter is described in detail within the report.</p> <p>The introduction of chapter 2 of the 2023 IASR identifies major sectoral uncertainties affecting the costs, benefits and need for investment in the NEM, and how they informed scenario development, including:</p> <ul style="list-style-type: none"> the health and evolution of the Australian economy the decarbonisation pathway for the Australian economy the scale and pace of electrification of Australia's residential, commercial, industrial and transportation sectors the scale of consumer energy resources (CER) progress and cost outlooks for enabling technologies across electricity generation, storage and CER, and the role of emerging energy technologies affecting Australia's decarbonisation pathway and economy. |
| | <ul style="list-style-type: none"> Taking the most probable value(s) for each input variable and/or parameter that forms part of the most likely scenario. | <p>Section 3.3 of the Draft 2024 ISP explains that AEMO considered the insights of a 'Delphi Panel' of more than 30 participants, including industry experts, government representatives, network service provider representatives, generators and retailers, researchers, academics, and consumer advocates. The <i>Step Change</i> scenario received the most consistent level of support and was considered the most likely scenario by most participant groups.</p> <p>Support for the <i>Progressive Change</i> scenario was also relatively high, yet it was also more polarised, with more diversity of views between participant groups.</p> <p>AEMO confirmed <i>Step Change</i> as the most likely scenario in the 2024 ISP. The scenario reflects an internally consistent collection of</p> |

⁹ AER. "Transgrid – Determination 2023-28". At <https://www.aer.gov.au/industry/registers/determinations/transgrid-determination-2023-28>.

| # | CBA Guidelines requirement/consideration | AEMO compliance |
|----|--|---|
| | | parameters that is broadly located within the middle of the scenario collection developed in the 2023 IASR and considers stakeholder feedback for each component submitted to AEMO’s Draft IASR consultation process. |
| | <ul style="list-style-type: none"> • Taking a balanced approach to risk in varying input variables and/or parameters to create reasonable scenarios around the most likely scenario. That is, AEMO should consider risks associated with under- or overdue investment and over- or premature investment, consistent with clause 5.22.5(e)(1) of the NER | The core scenarios in the 2023 IASR capture a range of plausible futures to assess the development needs of the future NEM and risks to consumers associated with over- or under-investment. In particular, narratives for each scenario set out in the 2023 IASR appropriately consider under and premature investment or over and overdue investment depending on the particular changes explored by the scenario. The scenario narratives influence the selection of inputs and parameters for each scenario. An appropriate balance of investment risk in the narratives drives a balanced approach to risk for inputs across all scenarios. The examination of risks of over- and under-investment is further explored throughout Appendix 6 of the 2024 ISP. Sensitivity analysis in the ISP further supports examination of these risks. |
| | <ul style="list-style-type: none"> • Presenting information on the key input variables it is varying to form each scenario, including (for each key input variable) the value(s) chosen for each scenario and how this compares to the underlying range of possible values. | Section 2.3 of the 2023 IASR provides details of the key inputs and input values varied across each scenario. Inputs are described quantitatively throughout the 2023 IASR and in the accompanying IASR Assumptions Book. |
| | <ul style="list-style-type: none"> • Using internally consistent input variables and parameters for each scenario, such that each scenario represents a plausible market environment. | The introduction to Chapter 2 of the 2023 IASR included "internally consistent" and "plausible" as two of the five core principles used to develop the scenarios. The 2023 IASR confirms that scenarios cover a broad range of plausible operating environments for the energy sector, and the potential changes in those environments, in an internally consistent way. AEMO’s Draft IASR consultation also specifically seeks stakeholder input on the internal consistency and breadth provided by the scenario collection, and has considered that feedback in finalising the IASR. |
| 11 | Requirement: Where the scenarios all have an equal likelihood AEMO <i>is required</i> to identify one scenario as the most likely scenario for the purposes of clause 5.22.5(e)(3). | Considering the Delphi Panel insights, the 2024 ISP assigns likelihoods of 43% for <i>Step Change</i> , 42% for <i>Progressive Change</i> and 15% for <i>Green Energy Exports</i> . While two scenarios are close in likelihood, the <i>Step Change</i> scenario is identified as AEMO’s ‘most likely’ scenario for the 2024 ISP. |

2.4 CBA methodology

This section discusses AEMO’s compliance with the CBA Guidelines binding requirements and considerations relating to the CBA methodology used by AEMO in the ISP – as summarised in Appendix A, Table 13 of the guidelines.

Table 4 CBA Guidelines Section 3.3.1 – Selecting development paths

| # | CBA Guidelines requirement/consideration | AEMO compliance | |
|----|---|--|---|
| 12 | <p>Requirement: In its process for selecting development paths, AEMO is required to:</p> | <ul style="list-style-type: none"> In step one, include information from transmission annual planning reports (TAPRs) on all proposed augmentations to the network and proposed replacements of network assets, including the proposed solution and other reasonable network options and non-network options. | <p>AEMO reviewed TAPRs and also used an annual TNSP data request process to ensure consistency. AEMO requested network modelling and project timing from TNSPs with regards to network projects to include in the 2024 ISP.</p> <p>AEMO consulted on the application of TNSP data and TAPR information through joint planning and via formal consultation on the 2023 IASR and the 2023 Transmission Expansions Options Report¹⁰ as well as noting updated inputs incorporated in the final 2024 ISP modelling after receiving updated information from project proponents in response to the Draft 2024 ISP (as noted in Appendix 5 Network Investments).</p> |
| | | <ul style="list-style-type: none"> Also in step one, include all committed and anticipated projects, and credible generation (and other non-network) projects that are proposed but not sufficiently progressed to be classified as anticipated. | <p>AEMO included all committed and anticipated generation and transmission projects in the 2024 ISP. These projects, and the process for updating them, was outlined in the 2023 IASR, and recorded in the relevant public AEMO Transmission Augmentation Information update or Generation Information update.</p> <p>As noted in the 2022 ISP compliance report, the selection of modelled projects evolved since the 2020 ISP and included additional REZs to cater to projects that are not sufficiently progressed to be classified as anticipated.</p> |
| | | <ul style="list-style-type: none"> In step three, select development paths that include variations in timing and level of transmission (or non-network option substitute/hybrid) investment. To include variations in level of transmission investment, AEMO must select at least one development path (in addition to the counterfactual development path) that excludes one or more projects from the combination of common transmission investments. | <p>During the 2024 ISP development process, AEMO considered over 1,000 potential development paths of new transmission investments to support the generation, storage and CER developments needed and narrowed them down to a final shortlist of 25 candidate development paths (CDPs). These include a 'counterfactual' path that has no new major network projects beyond those already committed or anticipated. CDPs 1 to 3 represent the least-cost development path for each of the three scenarios in the 2024 ISP, and feature variance in transmission project timings. Other CDPs provide additional variance for the timing and scale of transmission investment by adding, removing or staging potentially actionable projects. Other network options were optimised as future ISP projects.</p> <p>Appendix 6 of the 2024 ISP provides detail on the collection of CDPs that have been developed from each scenario's least-cost development path, including assessment of alternate credible options that were assessed as sub-optimal.</p> |
| 13 | <p>Requirement: In selecting development paths, AEMO is required to:</p> | <ul style="list-style-type: none"> Select development paths that contain commercially and technically feasible ISP projects, in accordance with the guidance set out in section 4.3.1; and | <p>AEMO considers that all projects included within the ISP's development paths are technically and commercially feasible credible options. Appendix 5 of the 2024 ISP provides detail regarding the credible options considered. The ISP candidate option and alternative credible options that were considered but were not selected as part of the optimal development path (ODP) are clearly identified for each actionable ISP project. Candidate and alternative options are also identified for actionable projects subject to jurisdictional frameworks.</p> |
| | | <ul style="list-style-type: none"> List the ISP projects in each selected development path. | <p>Tables 20 and 21 in Appendix 6 of the 2024 ISP identify the potentially actionable ISP projects in each CDP. ISP projects marked with a tick in a green box within Table 20 are potentially actionable projects, while unmarked ISP projects are potentially future ISP projects. Table 21 presents similar information by identifying specific ISP projects by name as either potentially actionable or not.</p> |
| 14 | <p>Consideration: In selecting development paths, AEMO must have regard to:</p> | <ul style="list-style-type: none"> Including non-network option substitutes or hybrids to a transmission network ISP project in one or more development paths, where appropriate. | <p>AEMO has considered several non-network options and network/non-network hybrids in the more than 1,000 development paths considered as part of the 2024 ISP development process. Appendix 5 of the 2024 ISP describes these non-network options in more detail. For example, a virtual transmission line was considered as part of the QNI Connect project, a limit extension special protection scheme was considered as part of the Darling Downs REZ Expansion project and other types of protection schemes were included within the scope of works of network solutions for several other projects.</p> |

¹⁰ At <https://aemo.com.au/consultations/current-and-closed-consultations/2023-transmission-expansion-options-report-consultation>.

| # | CBA Guidelines requirement/consideration | AEMO compliance |
|---|--|--|
| | | AEMO consulted on non-network options and technologies as part of the 2023 IASR (section 3.10.8). The Draft 2023 IASR invited proposals from non-network proponents, however, no proposals were received. Table 10 of this report explains why AEMO did not publish a notice calling for non-network solutions when publishing the Draft 2024 ISP and remained compliant with NER 5.22.12(a). |
| | <ul style="list-style-type: none"> Including staged projects in one or more development paths, where appropriate, such that it can assess option value (see section 3.4.2); and | <p>Consistent with the <i>ISP Methodology</i>, the 2024 ISP considered staged projects in multiple development paths. When narrowed down to the 25 CDPs subject to the CBA, Appendix 6 of the 2024 ISP considers Project Marinus Stages 1 and 2 and New England REZ Transmission Link 1 and Link 2 as potentially separate actionable ISP projects.</p> <p>Based on the CBA results within Appendix 6, the 2024 ISP did not identify any actionable projects that would benefit from staging in order to unlock additional option value by more easily allowing the latter stage of a project to be paused or cancelled should circumstances change.</p> |
| | <ul style="list-style-type: none"> Re-testing all ISP projects identified as actionable in a previous ISP, and which have not yet had costs approved in a contingent project process. | The 2024 ISP re-tested the actionability of all existing actionable ISP projects from the 2022 ISP which have not yet had contingent project funding approved for all stages of the project (i.e. Humelink, Project Marinus and VNI West). Approval of an early works contingent project application (CPA) is not sufficient to exempt a project from re-testing. Similarly, the 2024 ISP included re-testing of existing actionable New South Wales projects (i.e. Sydney Ring North and New England REZ Transmission Link) as actionable projects. |

Table 5 CBA Guidelines Section 3.3.2 – Defining the counterfactual development path

| # | CBA Guidelines requirement/consideration | AEMO compliance |
|----|--|---|
| 15 | <p>Requirement: AEMO is required to:</p> <ul style="list-style-type: none"> Develop a single counterfactual development path; and Not include in the counterfactual development path, any ISP projects in its selected development paths (see section 3.3.1) or any projects that may become future ISP projects. | Consistent with the <i>ISP Methodology</i> , the counterfactual development path in the 2024 ISP represents a development path with no future network augmentation other than committed or anticipated projects, or small intra-regional augmentations and replacement expenditure projects ¹¹ . The counterfactual does not include any ISP projects or any projects that may become future ISP projects. |

Table 6 CBA Guidelines Sections 3.3.3-3.3.5 – Valuing costs and market benefits

| # | CBA Guidelines requirement/consideration | AEMO compliance |
|----|---|---|
| 16 | <p>Requirement: In estimating classes of costs and market benefits, AEMO is required to:</p> <ul style="list-style-type: none"> Not factor qualitative cost or market benefit considerations into the CBA—that is, all relevant costs and market benefits must be quantified. | <p>All costs/market benefits that have been included in the CBA have been quantified from eligible cost and classes of market benefit consistent with the <i>ISP Methodology</i>. This includes no qualitative factors, and all quantifications are based on assumptions outlined in the 2023 IASR.</p> <p>The approach for applying a value of emissions reduction was outlined in the <i>ISP Methodology</i> ahead of a value being determined. The applied value is consistent with the amended National Electricity Objective and the AER’s draft guidance on valuing emissions reduction¹².</p> |
| | <ul style="list-style-type: none"> Not double count any costs or market benefits across ISP projects in a development path. | There is no double counting of costs or benefits considered in the CBA. All costs and benefits included in the CBA are allocated to distinct cost and benefit categories. |

¹¹ Some network investment is required in the *Green Energy Exports* counterfactual to enable energy to operate hydrogen export facilities, as explained in Appendix 2 of the 2024 ISP. This included targeted transmission development to support energy supply between REZ and export ports only, and is not considered to be an actionable or future ISP project.

¹² AER. *Valuing emissions reduction. AER draft guidance*, March 2024. At <https://www.aer.gov.au/system/files/2024-03/AER%20-%20Valuing%20emissions%20reduction%20draft%20guidance%20-%20March%202024.pdf>.

| # | CBA Guidelines requirement/consideration | AEMO compliance |
|---|--|---|
| | <ul style="list-style-type: none"> Not include in any analysis under the ISP, any cost or market benefit which cannot be measured as a cost or benefit to generators, distribution network service providers (DNSPs), TNSPs and consumers of electricity. | No such costs or market benefits were included in the CBA. |
| | <ul style="list-style-type: none"> For each development path, present: <ul style="list-style-type: none"> The key cost items in each class of costs, including the estimated capital cost of each ISP project in each development path (and its source(s)). | <p>AEMO has continued to develop its process and methodology for estimating transmission costs in the 2024 ISP with the aim of improving the accuracy and transparency of estimates. AEMO’s 2023 <i>Transmission Expansion Options Report</i>¹³ summarises the conceptual design, lead time, location and cost estimates for ISP projects. It leverages information in AEMO’s Transmission Cost Database – a tool allowing development of cost estimates for future ISP network expansion options that can be used by external parties to develop conceptual cost estimates for potential transmission augmentations.</p> <p>The <i>Transmission Expansion Options Report</i> and associated public database are world-leading initiatives in transparency and information provision in relation to regulated transmission builds.</p> <p>The 2023 <i>Transmission Expansions Options Report</i> sets out:</p> <ul style="list-style-type: none"> the methodology used for transmission cost estimation and review of TNSP cost estimates a new method for forecasting transmission augmentation costs over time, anticipating cost increases beyond economy-wide inflation a transparent Transmission Cost Database and cost forecasting approach cost sources for ISP modelling a breakdown of the design, capacity and cost estimates for each augmentation option, and generator connection and system strength remediation costs. <p>The estimated capital cost of each actionable ISP project and future ISP project is also provided in sections 5.3 and 5.4 of the 2024 ISP respectively. The estimated capital cost and high-level scope of every ISP project option is provided in sections A5.3 and A5.4 of Appendix 5.</p> |
| | <ul style="list-style-type: none"> The breakdown of total market benefits over the planning horizon by market benefit class—in present value terms. | The breakdown of net market benefits in net present value (NPV) terms for each CDP and each scenario is provided by comparison with the counterfactual case using the Generation and Storage Outlook data workbooks (see “Comparison” tab). |
| | <ul style="list-style-type: none"> Cost and market benefits timelines (that is, the stream of annual cost and market benefit cash flows) for the ISP projects in the development path over their economic lives. | Cost and market benefits timelines are provided in the Generation and Storage Outlook data workbooks. |
| | <ul style="list-style-type: none"> The present values of total costs and market benefits, any cash flow conversion calculations, and any assumptions implicitly or explicitly made about costs or market benefits beyond | The present values of total costs and market benefits are provided in the Generation and Storage Outlook data workbooks. Terminal values and the annuitisation of costs is explained in section 5.2 of the <i>ISP Methodology</i> . |

¹³ At <https://aemo.com.au/consultations/current-and-closed-consultations/2023-transmission-expansion-options-report-consultation>.

| # | CBA Guidelines requirement/consideration | AEMO compliance |
|----|--|---|
| | <p>the modelling period (equivalent to terminal value, where a project's asset life is longer than the modelling period); and</p> <ul style="list-style-type: none"> An explanation and justification of the rationale for its approach to calculating the present value of total costs and market benefits, including for any assumptions. | <p>The annuitisation and discounting of costs is explained in section 5.2 of <i>the ISP Methodology</i>.</p> |
| | <ul style="list-style-type: none"> Exclude from its analysis the costs (or negative benefits) of an ISP project's harm to the environment or to any party that is not prohibited under a law, regulation or other legal instrument. | <p>Only eligible costs and classes of market benefit are included in the CBA, consistent with the <i>ISP Methodology</i>.</p> <p>Environmental offset costs, where required under state legislation, are included in transmission cost estimates.</p> <p>Emissions reduction benefits are considered as an additional class of benefits calculated using the interim methodology for calculating the Value of Emissions Reduction (VER) agreed by Energy Ministers in February 2024¹⁴, and in accordance with the CBA Guidelines and <i>ISP Methodology</i>. This treatment is consistent with AEMO's obligation to have regard to the emissions reduction element in the National Electricity Objective¹⁵ and new NER requirements¹⁶, and is consistent with the guidance provided by the AER¹⁷.</p> |
| 17 | <p>Consideration: In estimating classes of costs and market benefits, AEMO must have regard to:</p> <ul style="list-style-type: none"> The cost allocation principles described under clause 6A.19.2 of the NER if/when allocating costs or market benefits between electricity and other markets. | <p>Chapter 2 of the 2023 <i>Transmission Expansion Options Report</i> describes how AEMO develops cost estimates for ISP purposes. The cost allocation principles described under NER 6A.19.2 are one of many factors to which AEMO has regard if AEMO must allocate costs between electricity and other markets.</p> |
| 18 | <p>Requirement: In estimating classes of costs, AEMO is required to:</p> <ul style="list-style-type: none"> Check its cost estimates against recent contingent project applications, recent tender outcomes governing transmission network augmentations, and/or final project outcomes (including variations); and | <p>The 2023 <i>Transmission Expansion Options Report</i> (Chapter 2) describes how AEMO develops cost estimates for ISP purposes. In the development and maintenance of the Transmission Cost Database, AEMO requested recent contingent project application data from TNSPs and the AER. All recent major projects were used to benchmark the Transmission Cost Database.</p> <p>AEMO engaged Mott MacDonald to develop a methodology for forecasting the cost of transmission projects for the period out to 2040, with June 2022 as the reference point. The methodology, and the subsequent escalation factors from June 2022, can be found in Mott MacDonald's report¹⁸ summarising the Transmission Cost Database update.</p> |

¹⁴ Ministerial Council on Energy. "MCE statement about the interim value of greenhouse gas emissions reduction", 28 February 2024. At <https://www.aemc.gov.au/sites/default/files/2024-03/Attachment%204%20VER%20MCE%20Statement%20for%20Commission%200324.pdf>.

¹⁵ Energy and Climate Change Ministerial Council. "Incorporating an emissions reduction objective into the national electricity objectives", 6 June 2023. At <https://www.energy.gov.au/energy-and-climate-change-ministerial-council/working-groups/energy-governance-working-group/incorporating-emissions-reduction-objective-national-energy-objectives>.

¹⁶ AEMC. "Harmonising the national energy rules with the updated national energy objectives (electricity)", 1 Feb 2024. At <https://www.aemc.gov.au/rule-changes/harmonising-national-energy-rules-updated-national-energy-objectives-electricity>.

¹⁷ AER. "Valuing emissions reduction final guidance – May 2024". At <https://www.aer.gov.au/industry/registers/resources/guidelines/valuing-emissions-reduction-final-guidance-may-2024>.

¹⁸ Mott MacDonald. AEMO Transmission Cost Database, Building Blocks Costs and Risks Factors Update, 26 April 2023. At https://aemo.com.au/-/media/files/stakeholder_consultation/consultations/nem-consultations/2023/2023-teor/mott-macdonald-transmission-cost-database-update-final-report.pdf?a=en.

| # | CBA Guidelines requirement/consideration | AEMO compliance | |
|----|--|---|---|
| | <ul style="list-style-type: none"> If AEMO establishes there is a material degree of uncertainty in the costs of an ISP project, the cost is the probability weighted present value of the direct costs of the ISP project under a range of different cost assumptions. | AEMO's Transmission Cost Database is used to produce Class 5b or 5a estimates for future ISP projects and to cross-check estimates received from TNSPs, to ensure consistency (see section 2.3 of the 2023 Transmission Expansion Options Report). Known and unknown risk allocations are used to account for uncertainty in project costs. The impact of cost uncertainty in the CDP collection is tested as a sensitivity and presented in Appendix 6 of the 2024 ISP. | |
| 19 | <p>Consideration: In estimating classes of costs, AEMO must have regard to:</p> | <ul style="list-style-type: none"> The market value of land when assessing the costs incurred in constructing or providing an ISP project; and | The Transmission Cost Database has regard to the market value of land. Easement and property costs for each project can be found in project estimate files as an output of the Transmission Cost Database. These were consulted on as part of the development of the <i>Transmission Expansions Options Report</i> . |
| | | <ul style="list-style-type: none"> The market value of land in ISP projects that explore building on a previously acquired easement (that is, land should not be treated as a sunk cost, to the extent that it can otherwise be sold). | AEMO conducted joint planning with TNSPs to ensure that options to use existing easements (including uprating or replacing existing transmission lines) were included in the ISP analysis without assuming the land to be a sunk cost. For example, this included the option for augmenting the Central Queensland to Gladstone Grid flow path, and one of the options for augmenting the Central New South Wales to Sydney, Newcastle and Wollongong flow path. |
| 20 | <p>Requirement: AEMO is required to exclude from market benefits:</p> | <ul style="list-style-type: none"> The transfer of surplus between consumers and producers. | <p>Only classes of market benefits permitted to be included were used in the CBA for the 2024 ISP. Wealth transfers between NEM participants are excluded from the CBA.</p> <p>AEMO did not consider changes in network losses, ancillary service costs or competition benefits as part of the CBA for the 2024 ISP because these market benefit classes were not considered material to the outcomes of the 2024 ISP, consistent with our approach to the ISP CBA set out in the ISP Methodology. Where material, changes in these market benefit classes may be considered by TNSPs in the RIT-T analysis for any actionable ISP projects.</p> <p>Option value is captured implicitly in the 2024 ISP CBA through the variability of different ISP projects across the CDP collection, including the potential staging of actionable projects. Because option value was not estimated separately, this approach is aligned with the CBA Guideline requirements.</p> |
| | | <ul style="list-style-type: none"> Classes of costs set out in clause 5.22.10(d) of the NER; and | |
| | | <ul style="list-style-type: none"> Competition benefits or any additional option value where they have already been accounted for in other elements of the market benefit. | |
| 21 | <p>Requirement: AEMO is required to assess the market benefits with the development path against the market benefits with the counterfactual development path.</p> | <p>This involves, for each development path:</p> <ol style="list-style-type: none"> Deriving the state of the world with the development path in place in each scenario, and the state of the world with the counterfactual development path in place in each scenario, Estimating market benefits by comparing, for each scenario, the state of the world with the development path in place against the state of the world with the counterfactual development path in place, and Quantifying estimated values for any market benefit classes that are not captured by the market modelling comparison (if any). | AEMO has followed CBA Guidelines requirements for undertaking the ISP CBA as described in Appendix 6 of the 2024 ISP and sections 5.3-5.8 of the <i>ISP Methodology</i> . This process includes the development of a counterfactual development path for each scenario. The comparison of system costs between CDPs and the counterfactual is provided throughout Appendix 6 and in detail in the accompanying data workbooks. All material classes of market benefit are captured within the market modelling. |
| 22 | <p>Consideration: In estimating classes of market benefits,</p> | <ul style="list-style-type: none"> Including all existing assets in all states of the world (until their expected retirement)—unless AEMO has evidence to suggest a project(s) should not be included in the market development modelling, | Consistent with the <i>ISP Methodology</i> , the 2024 ISP includes all committed, existing and anticipated projects in all states of the world, and in all development paths. |

| # | CBA Guidelines requirement/consideration | AEMO compliance |
|---|--|--|
| | <p>AEMO <i>must</i> have regard to:</p> <ul style="list-style-type: none"> Including all committed and anticipated projects outside its selected development paths in all states of the world (until their expected retirement)—unless AEMO has evidence to suggest a project(s) should not be included in the market development modelling; and Presenting the modelled projects that flow from the ISP projects in each development path in each scenario. | <p>Existing thermal generation has been allowed to retire before expected closure years, if so determined using the approach set out in the ISP Methodology.</p> <p>AEMO has set out the modelled projects in each scenario in the 2024 ISP (see Appendix 2 and Appendix 5).</p> |

Table 7 CBA Guidelines Section 3.3.6 – Selecting an optimal development path

| # | CBA Guidelines requirement/consideration | AEMO compliance |
|----|--|--|
| 23 | <p>Requirement: In selecting an optimal development path, AEMO <i>is required</i> to follow this framework:</p> <p>4. Conduct scenario analysis to present a table with the net economic benefit of each development path in each scenario. The net economic benefit of a development path is its market benefit (section 3.3.5) less costs (section 3.3.3).</p> <p>5. Rank the development paths on the basis of:</p> <p>(a) A risk neutral decision making approach. Under a risk neutral approach, the ranking must be based on the weighted average net economic benefit of each development path, with weights determined according to the likelihood of each scenario occurring.</p> <p>(b) Where relevant, one or more alternative decision making approaches set out in AEMO's ISP methodology.</p> <p>6. Use professional judgement in balancing the outcomes of the above decision making approaches to select an optimal development path that has a positive net economic benefit in the most likely scenario and explaining:</p> <ul style="list-style-type: none"> Why the choice optimises the net economic benefit to all those who produce, consume and transport electricity in the market, The potential 'cost' associated with a risk averse choice (if taken); and Why the level of risk neutrality or risk aversion chosen is a reasonable reflection of consumers' level of risk neutrality or risk aversion. | <p>The weighted net market benefits of each CDP in each scenario are presented in Table 22 of Appendix 6 of the 2024 ISP, with further detail provided in the accompanying data workbooks.</p> <p>The ranking of CDPs on the basis of scenario-weighted net market benefits (i.e. the risk neutral approach) and worst weighted regrets is also provided in Table 22 of Appendix 6. Worst weighted regrets is a risk averse decision making approach as set out in section 5.7.1 of the <i>ISP Methodology</i> and consistent with that described in section 3.3.6 of the CBA Guidelines.</p> <p>Chapter 7 of the 2024 ISP explains AEMO's rationale for selecting the ODP. Appendix 6 of the 2024 ISP explains AEMO's ODP selection in detail with reference to the CBA results and AEMO's analysis.</p> <p>This analysis demonstrates that the ODP (CDP14) both maximises and optimises net market benefits across the CDP collection and provides positive net market benefits in the most likely Step Change scenario (and all remaining scenarios).</p> <p>The ODP delivers over \$21 billion in weighted net market benefits, which includes around \$4 billion in emissions reductions benefits. The top 10 ranked CDPs by weighted net market benefits deliver total benefits within \$100 million of each other. The CDPs within that top 10 include multiple transmission projects and demonstrate the significant benefits delivered when multiple transmission projects are identified as actionable. In contrast, delaying all transmission projects to outside each project's respective actionable window (CDP25) delivers almost \$5 billion fewer benefits than the top 10 CDPs. While still more beneficial than the counterfactual scenario, slowing down the development of the key transmission projects that enable an efficient and effective energy transition is clearly less beneficial than continuing to develop the NEM's transmission system.</p> <p>AEMO selected the CDP which maximises weighted net market benefits as the ODP, therefore, the potential 'cost' of the ODP when compared to the top-ranked development path under a risk neutral decision-making approach is zero.</p> |

| # | CBA Guidelines requirement/consideration | AEMO compliance |
|---|---|--|
| | | Section A6.6 explains how AEMO considered consumer risk preferences when selecting the ODP. AEMO did not apply the recently-developed consumer risk metric estimate when selecting the ODP, as no reason was identified to indicate that the selected CDP was not already a reasonable reflection of consumers' level of risk neutrality or risk aversion. |
| | 7. Undertake sensitivity testing and/or cross checks and explain the significance of these for the optimal development path; and present information on key distributional effects. | <p>Appendix 6 describes the resilience of the top 5 ranked CDPs to changes in input assumptions used in the core ISP scenarios via sensitivity testing. The 2024 ISP included additional sensitivity analyses that extended the analysis provided in the Draft 2024 ISP to address key risks raised by stakeholders in submissions on the Draft 2024 ISP and other recent developments.</p> <p>The additional sensitivity testing included in the 2024 ISP included:</p> <ul style="list-style-type: none"> • The impact on the ODP of the agreement to extend the operating life of the Eraring Power Station • The value of the forecast coordination of CER • The impact on the ODP if additional industrial demand in addition to the growth forecast in the <i>Step Change</i> scenario connects to key growth areas, particularly northern South Australia and Sydney, Newcastle and Wollongong • The impact on the ODP of updated assumptions regarding the electrification pace of the transport industry • The impact on the ODP if supply chains are constrained, slowing the capability to commission generation, storage and transmission developments • The impact on the ODP if hydrogen production was less flexible than assumed in the scenario analysis, and • The impact on the ODP if weather variance is different to the core sequence of weather applied in the scenario analysis. <p>This complemented the sensitivity analysis undertaken for the Draft 2024 ISP, presented in Appendix 6 of the 2024 ISP, which included alternate discount rates, rapid decarbonisation, reduced energy efficiency, electrification alternatives, constrained supply chains, reduced social licence and the development of specific pumped hydro projects. In some instances, sensitivity analysis that was performed in the Draft 2024 ISP was not re-simulated, as the updated model parameters were not expected to have changed the insights obtained from the Draft 2024 ISP.</p> <p>The 2024 ISP also includes cross-checks, as described in section 3.3.6 of the CBA Guidelines. Most notably, for each of the projects discussed in section A6.2.2 of the Appendix 6, the relative market benefits of each project are assessed by comparing the least-cost development path in the <i>Step Change</i> scenario (or an alternative CDP if more appropriate) to a development path that differs only in not delivering the relevant project at all. This is referred to as the 'TOOT' (Take-one-out-at-a-time) approach.</p> <p>Finally, Appendix 6 also assesses distributional effects for two CDPs under the <i>Step Change</i> and <i>Progressive Change</i> scenarios: the ODP (CDP 14) and CDP 25 which delays all projects until after their respective actionable windows. By comparing the costs to consumers that arise from these CDPs, AEMO has estimated how distributional effects may arise depending on the development path (including the effect on the ISP development opportunities).</p> |

2.5 Other aspects of the CBA

This section discusses AEMO compliance with the CBA Guidelines binding requirements and considerations relating to other aspects of the CBA, as summarised in Appendix A, Table 13 of the guidelines.

Table 8 CBA Guidelines Section 3.4.1 – Treatment of externalities

| # | CBA Guidelines requirement/consideration | AEMO compliance |
|----|---|--|
| 24 | <p>Requirement:</p> <p>The following are <i>requirements</i> for AEMO:</p> <ul style="list-style-type: none"> Funds that move between Participants count as a wealth transfer and do not affect the calculation of costs or market benefits under the ISP. Funds from an Other Party to a Participant do affect the calculation of costs or market benefits under the ISP. These funds can only affect the calculation of costs and market benefits when AEMO expects funding commitment. AEMO is required to report the funds in the draft ISP and final ISP. | <p>Wealth transfers between market participants in the NEM were not included in the CBA for the 2024 ISP. Although distributional effects are analysed in the final ISP, these did not influence CBA outcomes.</p> <p>For transmission cost estimates completed by AEMO (National Planner), a full breakdown of costs is published, including external funding (if any). AEMO also reviewed cost estimates that were provided by TNSPs. The 2024 ISP includes reference to funds provided by government to Project Marinus, in the 2024 ISP Inputs, Assumptions and Scenarios (IAS) workbook¹⁹.</p> <p>Following the Federal Government’s announcement in October 2022 of the Rewiring the Nation framework, the 2023 IASR confirms that AEMO did not incorporate the impact of concessional finance in the 2024 ISP (or the Draft 2024 ISP).</p> |
| 25 | <p>Consideration:</p> <p>If expected funds from an Other Party to a Participant do not eventuate, AEMO <i>must consider</i> whether a subsequent ISP update is required to remove these from the CBA.</p> | <p>No funds from an ‘Other Party’, such as government funding, were included in the 2024 ISP and subsequently withdrawn. AEMO will continue to consider the need for an ISP update should funding arrangements for an actionable project materially change.</p> |

Table 9 CBA Guidelines Section 3.4.2 – Option value

| # | CBA Guidelines requirement | AEMO compliance |
|----|---|--|
| 26 | <p>Consideration:</p> <p>In capturing option value, AEMO <i>must have regard</i> to:</p> <ul style="list-style-type: none"> Development paths that contain option value to account for new information that arises at a later stage, including through: <ul style="list-style-type: none"> the timing and staging of ISP projects in a development path, the use of non-network options as ISP projects or stages of ISP projects; and staging or deferring ISP projects where the market benefits occur late in the modelling period. <p>The stages associated with a given project can be incorporated into a single ISP project, or can be separated into multiple ISP projects, depending on their characteristics.</p> | <p>A CDP represents a collection of development paths which share a set of potentially actionable projects. CDPs vary with respect to status of the potentially actionable projects. The least-cost development path in each scenario was used as the basis for forming the initial set of CDPs. Additional CDPs were added based on the process set out in Section 5.4 of the <i>ISP Methodology</i>, which involves forming new CDPs by moving the timings of potentially actionable projects in an existing CDP or by including additional or alternative projects to a CDP, thereby creating CDPs with option value.</p> <p>As explained above in response to element 14 in Appendix A, Table 13 of the CBA Guidelines, during the 2024 ISP development process, AEMO considered over 1,000 potential development paths that included non-network options, network/non-network hybrids and various timings for ISP projects. These development paths were narrowed down to a collection of 25 CDPs.</p> <p>Appendix 5 of the 2024 ISP describes some of the non-network options considered in more detail. Appendix 6 of the 2024 ISP assesses Project Marinus Stages 1 and 2 and New England REZ Transmission Link 1 and Link 2 as separate potentially actionable ISP projects.</p> <p>A call for non-network options accompanies the 2024 ISP for all newly actionable ISP projects identified in the report.</p> |
| | <ul style="list-style-type: none"> Whether scenario analysis results under AEMO’s chosen decision making approach (see section 3.3.6) appropriately capture option value. | <p>For the purposes of NER 5.22.10(c)(1)(x), AEMO does not consider any additional option value that is not already included in other classes of market benefit would be material to the assessment.</p> |
| | <ul style="list-style-type: none"> How staging of actionable ISP projects could be further explored in the RIT-T process, and then | <p>The identified needs for existing actionable projects remain consistent with those in the previous ISP(s). All existing projects subject to the ISP framework (HumeLink, VNI</p> |

¹⁹ At the time of providing this Compliance Report to the AER, the 2024 ISP IAS Workbook has not yet been published. As noted in the 2024 ISP, this workbook will be published on AEMO’s website within July 2024. The 2024 ISP IAS Workbook will include the details of the external funding for Project Marinus. Some of this information was provided to AEMO within July 2024, rather than by 26 June 2024. This grant funding was excluded from the cost estimates applied in the ISP CBA assessment.

| # | CBA Guidelines requirement | AEMO compliance |
|---|--|---|
| | <p>describing the identified need and assigning scenarios accordingly.</p> | <p>West and Project Marinus) have completed the RIT-T, but have not yet progressed to committed or anticipated status. The 2024 ISP reassessed the actionability of all projects that had not yet reached anticipated or committed status, including an assessment of the possible staging of Project Marinus.</p> <p>For newly actionable projects identified in the 2024 ISP, Appendix 5 provides the relevant identified need and, for those projects subject to the ISP framework, the ISP scenarios selected for each RIT-T. AEMO considers each identified need allows RIT-T proponents to further explore staging amongst the different credible options (including non-network options). Each identified need achieves this by including in the identified need the particular risks that AEMO seeks to mitigate through the actionable project, and describing the identified need in terms on an objective without limiting the types of options, or types of staging of those options, that may be applied to the RIT-T.</p> <p>For all newly actionable ISP projects, the 2024 ISP assigns all 3 scenarios to the RIT-T. In this case, AEMO considers assigning the maximum number of scenarios to each RIT-T maximises the opportunity for the RIT-T to explore the benefits of staging and option value under different scenarios. AEMO did not find reason to remove scenario(s) from the collection for any newly actionable ISP project in the 2024 ISP.</p> |
| | <ul style="list-style-type: none"> When decision rules associated with staged projects eventuate, leading to a subsequent stage being needed or not needed—and, where relevant, incorporating the subsequent stage into an ISP. | <p>The 2024 ISP does not identify any actionable projects with staging for the purpose of the Rules and the ISP framework. AEMO notes several project proponents have staged (or intend to stage) the funding or delivery (or both) of actionable projects, however, those decisions are at the discretion of the project proponents and are not driven by ISP outcomes. Therefore, decision rules were not necessary for the 2024 ISP and were not relevant to any actionable projects during the two year period prior to publication of the 2024 ISP.</p> |

Table 10 CBA Guidelines Section 3.4.3 – Non-network options

| # | CBA Guidelines requirement | AEMO compliance |
|----|--|---|
| 27 | <p>Requirement: Prior to the draft ISP, AEMO is required to:</p> <ul style="list-style-type: none"> Undertake early engagement with non-network proponents to gather information in relation to non-network options (see Explanatory box 4); and If there are any credible non-network options identified through early engagement and joint planning, but not included in a TAPR, include these in step one of its process for selecting development paths in section 3.3.1 (where it enters a range of network and non-network investment options into its model) | <p>In preparing the 2024 ISP, AEMO considered credible options including non-network options. Prior to the Draft 2024 ISP, non-network options considered by AEMO were captured in the 2023 <i>Transmission Expansion Options Report</i>.</p> <p>AEMO consulted with non-network proponents throughout the IASR development process. Section 3.10.8 of the Draft 2023 IASR "seeks input on any non-network options for consideration in the 2024 ISP" and clarifies that "At this stage, AEMO is seeking information on non-network technologies or proponents so ISP modelling can flag opportunities for competitive non-network investment."</p> |
| 28 | <p>Requirement: In considering non-network options in the process set out in clause 5.22.12 of the NER, AEMO is required to:</p> <ul style="list-style-type: none"> Provide sufficient detail on the technical characteristics of the non-network options in its notice requesting submissions for non-network options, in such a way that appropriate non network solutions can be developed. | <p>The Draft 2024 ISP did not call for non-network solutions using the process set out in NER 5.22.12 because:</p> <ul style="list-style-type: none"> There were no newly actionable ISP projects in the Draft 2024 ISP. A number of previously actionable ISP projects remained actionable, either as actionable ISP projects, or as actionable New South Wales projects. For those projects, non-network options have either already been called for through previous ISP and IASR consultations, or should be considered separately |

| # | CBA Guidelines requirement | AEMO compliance |
|---|--|---|
| | | <p>through the New South Wales Electricity Infrastructure Roadmap framework.</p> <ul style="list-style-type: none"> The Draft 2024 ISP identified two new projects as actionable Queensland projects. For those projects, non-network options may be considered separately through the Queensland Energy and Jobs Plan framework. <p>In accordance with NER 5.22.14(c)(1), the 2024 ISP has called for non-network solutions for all newly actionable ISP projects not included in the Draft 2024 ISP. Four separate notices were published requesting submissions for non-network options and included the information specified in NER 5.22.12(a)²⁰. Specifically, submissions were requested on Sydney Ring South, Mid-North South Australia REZ Expansion, Waddamana to Palmerston Transfer Capability Upgrade and QNI Connect projects.</p> <p>Consistent with the approach for the Draft 2024 ISP, AEMO did not call for non-network solutions for the one remaining actionable project that was not included in the Draft 2024 ISP, the Hunter-Central Coast REZ Network Infrastructure project, because that project is subject to the New South Wales Electricity Infrastructure Roadmap framework.</p> <p>When describing the technical characteristics of the non-network options that AEMO considers are required to meet the relevant identified need, each notice requesting non-network proposals clarifies that AEMO is not prescriptive at this early stage of the regulatory process regarding the role of non-network options and the operating profiles for these solutions. By broadly describing the technical characteristics required to meet, or reasonably likely to meet, the identified need, AEMO endeavours to maximise the number of potential non-network solutions that are proposed in response to each notice.</p> |
| | <ul style="list-style-type: none"> Include the ISP consumer panel and/or other consumer stakeholders in the preliminary review of non-network option proposals, to incorporate their views and preferences. | <p>The process for considering non-network options set out in NER 5.22.12(c)-(e), including the preliminary review of proposals, only applies to actionable ISP projects identified at the draft ISP stage and, as explained above, the Draft 2024 ISP did not call for non-network solutions.</p> <p>The process for calling for non-network options at the final ISP stage, as set out in NER 5.22.14(c)(1), does not require AEMO and TNSPs to conduct a preliminary review of non-network proposals.</p> <p>However, to promote due consideration by RIT-T proponents of any non-network proposals received by AEMO, a 12-week consultation period was included in each of the four notices requesting non-network solutions, consistent with the timeframe required by NER 5.22.12(b) when AEMO calls for submissions at the draft ISP stage.</p> <p>All submissions will be passed onto the relevant RIT-T proponents.</p> <p>Regarding the consideration of the ISP Consumer Panel and other consumer stakeholders of non-network options generally, AEMO has encouraged engagement on non-network options identified during the IASR development process and their ability to meet the relevant identified need of actionable projects identified in the Draft 2024 ISP.</p> |
| | <ul style="list-style-type: none"> Document the process and findings of the preliminary review of non-network option proposals, and publish this with or before the final ISP. | <p>As explained above, the Draft 2024 ISP did not call for non-network solutions.</p> |

²⁰ These four notices are published alongside the 2024 ISP at <https://aemo.com.au/energy-systems/major-publications/integrated-system-plan-isp/2024-integrated-system-plan-isp>.

| # | CBA Guidelines requirement | AEMO compliance |
|---|---|--|
| | <ul style="list-style-type: none"> Provide its reasoning in the final ISP for each non-network option proposal AEMO concludes will not meet the relevant identified need. This includes: <ul style="list-style-type: none"> specific characteristics of the proposed non-network option that do not meet the relevant identified need, and why, if its reasoning is related to risk or uncertainty, then describe the risk/ uncertainty, and provide an assessment of the risk/ uncertainty compared to the ISP candidate option, as well as a comparison of the non-network option cost with the ISP candidate option cost; and how the option could be improved to meet the identified need. | As explained above, the Draft 2024 ISP did not call for non-network solutions. |

2.6 Interactions and alignment with the RIT-T

This section discusses AEMO compliance with the CBA Guidelines binding requirements and considerations relating to interactions and alignment with the RIT-T, as summarised in Appendix A, Table 13 of the guidelines.

Table 11 CBA Guidelines Section 3.5.1 – Describing the identified need for an actionable ISP project

| # | CBA Guidelines requirement/consideration | AEMO compliance |
|----|---|---|
| 29 | <p>Requirement: In describing the identified need relating to an actionable ISP project, AEMO is required to:</p> <ul style="list-style-type: none"> Assign one identified need to each actionable ISP project in an optimal development path (noting there can be multiple dimensions or components to a single identified need). | <p>AEMO followed the process outlined in section 5.9.2 of the <i>ISP Methodology</i> for specifying an identified need, which itself takes into account the requirements and considerations contained in the CBA Guidelines. In the 2024 ISP, one identified need is assigned to each actionable project, whether subject to the ISP framework or a jurisdictional scheme.</p> |
| | <ul style="list-style-type: none"> For each identified need relating to an actionable ISP project, describe the identified need as the objective to be achieved by investing in the network. It is not the means to achieve the objective. That is, a description of an identified need must not mention or explain a particular method, mechanism or approach to achieving a desired outcome. | <p>In the 2024 ISP, each identified need is described as an objective to be achieved, often containing multiple dimensions, and no identified need mentions or explains a particular method, mechanism or approach to address it. Identified needs are framed to allow either network or non-network options (or a combination of the two) to meet the need.</p> <p>Consistent with the <i>ISP Methodology</i>, identified needs in the 2024 ISP:</p> <ul style="list-style-type: none"> Support the long-term interests of consumer by including an increase in market benefits in the need, unless the need relates to reliability corrective action (noting none of the identified needs contained in the 2024 ISP relate to reliability corrective action) Consider related elements in the ODP and any specific risks mitigated through the selection of that path Provide sufficient specificity such that options can be narrowed without pre-supposing a particular outcome, and Consider opportunities to realise option value by enabling staged investments. |
| 30 | <p>Consideration: In describing the identified need relating to an actionable ISP project, AEMO must have regard to:</p> <ul style="list-style-type: none"> Having a clear and logical basis in contributing to the long term interests of electricity consumers—that is, linked to increasing one or more market benefits, and/or the key driver(s) of those market benefits. | <p>The identified needs used in the 2024 ISP have a clear and logical basis, often linked to increasing net market benefits. For projects previously identified as actionable, AEMO kept the identified needs unchanged to ensure alignment with the RIT-T. For newly actionable projects, AEMO followed the process outlined in section 5.9.2 of the <i>ISP Methodology</i>.</p> |
| | <ul style="list-style-type: none"> Maintaining the integrity of the optimal development path, reflecting that AEMO has identified each | <p>Consistent with section 5.9.2 of the <i>ISP Methodology</i>, and to maintain the integrity of the ODP, the identified needs included in Appendix 5 of the 2024 ISP were formulated after having considered:</p> |

| # | CBA Guidelines requirement/consideration | AEMO compliance |
|---|---|--|
| | <p>actionable ISP project to make a particular contribution towards achieving a system-wide optimised solution. This includes incorporating the risks AEMO seeks to mitigate through the actionable ISP project in its optimal development path, if the optimal development path was chosen using a risk averse decision making approach.</p> | <ul style="list-style-type: none"> benefits from the capacity outlook model the engineering assessment and time-sequential model, and outcomes of the CBA, including option value and risk mitigation relevant to specific ISP projects. <p>As explained in Table 7 above, AEMO selected the CDP which maximises weighted net market benefits as the ODP. Therefore, ODP selection was not based wholly or primarily on a risk averse approach. Nevertheless, as explained in Table 9 above, risks that AEMO seeks to mitigate through a particular actionable project are captured in relevant identified needs. For example, the identified need for the Mid-North South Australia REZ Expansion project captures the risk of inadequate network capacity to supply large industrial loads and high levels congestion on renewables from the Mid-North. AEMO considers a RIT-T proponent can address risks included in the identified need by considering variations of the ISP candidate option identified in the 2024 ISP, including different staging and timing options and the incorporation of non-network solutions.</p> |
| | <ul style="list-style-type: none"> Facilitating RIT-T proponents to explore different credible options (including non-network options) in applying the RIT-T based on more detailed / granular information at the individual project level, rather than pre-supposing a particular solution. | <p>As explained above, identified needs in Appendix 5 of the 2024 ISP are described in accordance with the <i>ISP Methodology</i> and in a way that provides flexibility to explore a range of options, including ISP candidate option variants, different staging and timing options, non-network options and any other options the RIT-T proponent considers credible. Identified needs are described as an objective to be achieved without referring to a particular method, mechanism or approach to address it.</p> |
| | <ul style="list-style-type: none"> Facilitating RIT-T proponents to explore credible options with option value (that is, involve staging decisions). This can include considering the timing of when market benefits are expected to be delivered, and key uncertainties to the investment decision that could be used in a decision rule. | <p>The exploration of option value is allowed for in the drafting of the identified need through the identification of key risks to be mitigated for relevant projects. Examples of key risks are described above for the Mid-North South Australia REZ Expansion project.</p> |

Table 12 CBA Guidelines Section 3.5.2 – Assigning scenarios to RIT-T proponents for actionable ISP projects

| # | CBA Guidelines requirement | AEMO compliance |
|----|---|--|
| 31 | <p>Requirement: Once AEMO has selected an optimal development path in accordance with the framework in section 3.3.6, it is required to assign one or more scenarios to each actionable ISP project that will be used by the relevant RIT-T proponent in applying the RIT-T to that project.</p> | <p>Appendix 5 of the 2024 ISP provides information on every actionable ISP project and project that is actionable under a jurisdictional scheme. AEMO assigned ISP scenarios to the RIT-Ts for new actionable ISP projects for which a Project Assessment Draft Report (PADR) is due. Projects actionable under jurisdictional schemes are subject to alternative regulatory frameworks that do not require a RIT-T. Existing actionable ISP projects (i.e. HumeLink, Project Marinus and VNI West) have already completed the RIT-T.</p> <p>AEMO assigned all three ISP scenarios and their corresponding scenario weightings in the 2024 ISP to the RIT-T for each new actionable ISP project.</p> |
| 32 | <p>Requirement: In selecting the scenario(s) to assign to each actionable ISP project in an optimal development path, AEMO is required to:</p> | <p>Only scenarios identified in the 2023 IASR were assigned to RIT-Ts for new actionable ISP projects.</p> |
| | <ul style="list-style-type: none"> Only use scenarios identified in the IASR. Assign a likelihood-based weight to each scenario if more than one scenario is assigned to a given actionable ISP project. These must be proportional to the weights used by AEMO in presenting a risk neutral decision making approach, as part of the framework for selecting an optimal development path set out in section 3.3.6. These weights must be | <p>AEMO assigned all three ISP scenarios to the RIT-T for each new actionable ISP project and assigned the same scenario weightings that apply to the 2024 ISP (i.e. <i>Progressive Change</i> (42%), <i>Step Change</i> (43%) and <i>Green Energy Exports</i> (15%)).</p> |

| # | CBA Guidelines requirement | AEMO compliance |
|----|--|---|
| | <p>used even if AEMO has selected the optimal development path based on a risk averse decision making approach.</p> <ul style="list-style-type: none"> Explain its reasoning for selecting the scenario(s) and corresponding weights (if applicable) for each actionable ISP project, and seek stakeholder input on its choices. | <p>In the 2024 ISP, and in Appendix 5 of the 2024 ISP, AEMO refers to the 2024 ISP Delphi Panel overview explaining the reasoning for the weights applied to the three scenarios for the 2024 ISP, and AEMO explains its reasoning for the scenarios themselves in the 2023 IASR.</p> <p>In Appendix 5 of the 2024 ISP, AEMO applies the full set of scenarios and their corresponding weights to each newly actionable ISP project. Both <i>Progressive Change</i> and <i>Step Change</i> have relatively high weightings and contain scenario parameters that are highly relevant to the RIT-Ts for the new actionable ISP projects identified in the 2024 ISP. <i>Green Energy Exports</i> has a lower relative weighting but is highly relevant to the risks captured in the relevant identified need for each newly actionable ISP project. Assigning all three ISP scenarios also allows RIT-T to better consider the risks of overdue or under-investment and premature or over-investment.</p> <p>AEMO did not identify a reason to exclude scenario(s) from the collection for any of the newly actionable ISP projects.</p> |
| 33 | <p>Consideration: In selecting the scenario(s) to assign to each actionable ISP project in an optimal development path, AEMO <i>must have regard to:</i></p> <ul style="list-style-type: none"> Achieving consistency between the ISP and related RIT-Ts, including through alignment of the risks AEMO is prioritising through its decision making approach(es) under the framework for selecting an optimal development path set out in section 3.3.6. Allowing the RIT-T proponent to capture the option value of exploring credible options that contain more granular staging decisions (that is, contain key uncertainties to the investment decision which could influence a decision rule); and Balancing the need for a rigorous CBA with reducing the analytical burden on the RIT-T proponent in the RIT-T process. | <p>Assigning all three ISP scenarios to the RIT-Ts for new actionable projects promotes ISP/RIT-T alignment while allowing RIT-T proponents to consider the same risks as AEMO in the 2024 ISP or any additional risk considered relevant.</p> <p>Assigning all three scenarios allows RIT-T proponents to capture option value, where applicable, by considering specific risks captured in the relevant identified need and the benefits of various forms of staging in different states of the world.</p> <p>AEMO considers that assigning three ISP scenarios to a RIT-T promotes a rigorous CBA without imposing undue analytical burden on the RIT-T proponent.</p> <p>In the case of the actionable ISP projects identified in the 2024 ISP, AEMO did not identify a need to remove a scenario from the collection.</p> |

Table 13 CBA Guidelines Section 3.5.3 – Feedback loop

| # | CBA Guidelines requirement | AEMO compliance |
|----|--|--|
| 34 | <p>Requirement: In providing written confirmation to the RIT-T proponent [under clause 5.16A.5(b) of the NER], AEMO <i>is required to:</i></p> <ul style="list-style-type: none"> Publish its written confirmation to the RIT-T proponent on AEMO’s website; and Identify the cost (of the RIT-T preferred option) that AEMO has used as its basis for confirming that the status of the actionable ISP | <p>Since publication of the 2022 ISP, AEMO has completed three ISP feedback loop assessments:</p> <ul style="list-style-type: none"> HumeLink (early works), May 2023 HumeLink (full project), December 2023, and VNI West (full project), December 2023. <p>AEMO completed another feedback loop assessment after publication of the 2024 ISP:</p> <ul style="list-style-type: none"> HumeLink (full project), July 2024. <p>AEMO’s feedback loop confirmation for each assessment is published on AEMO’s ISP feedback loop notices webpage²¹.</p> <p>For all feedback loop assessments, AEMO assesses the cost of the project (or stage) consistent with the guidance in section 4.4 of the</p> |

²¹ At <https://aemo.com.au/en/energy-systems/major-publications/integrated-system-plan-isp/integrated-system-plan-feedback-loop-notices>.

| # | CBA Guidelines requirement | AEMO compliance |
|----|--|---|
| | <p>project as part of the optimal development path remains unchanged (noting that section 4.4 clarifies what this cost should be where staging is involved).</p> | <p>CBA Guidelines and section 3.3 of the AER's guidance note on the regulation of actionable ISP projects²².</p> <p>When assessing the HumeLink (early works) feedback loop in May 2023, the most recent ISP (as defined in the NER) at the time was the 2022 ISP. The 2022 ISP identified HumeLink as a staged actionable ISP project whereby both stage 1 (early works) and stage 2 (project delivery) were actionable. In accordance with section 4.4 of the CBA Guidelines, where project staging is captured within a single actionable ISP project, the RIT-T proponent must obtain feedback loop confirmation from AEMO for each stage before submitting a CPA.</p> <p>Therefore, the cost assessed by AEMO in the HumeLink (early works) feedback loop was the total cost of the early works stage (which included costs already approved by the AER in April 2022), as explained in the published confirmation. As required by the CBA Guidelines, AEMO also had regard to the full cost of the HumeLink project when confirming that the status of the project as an actionable ISP project remains unchanged.</p> <p>For the HumeLink (full project) and VNI West feedback loop assessments in December 2023, the most recent ISP at the time was the Draft 2024 ISP by way of ISP update. There were no staged projects identified in the Draft 2024 ISP (or final 2024 ISP) for the purposes of section 4.4 of the CBA Guidelines (which is referred to as "directly staging a project" in the AER's guidance note)²³, and the staging of HumeLink that previously applied in the 2022 ISP was removed. Instead, HumeLink and VNI West were progressed by "staging the CPA process" (as referred to in the AER's guidance note) whereby the relevant TNSP elects to break up project funding into multiple CPAs.</p> <p>Consequently, when considering the cost of the preferred option in these December 2023 assessments, AEMO considered the entire cost of the project as stated in the feedback loop request, consistent with the AER's guidance note²⁴. The total project cost considered by AEMO in the feedback loop, and the reasoning for considering it, is clearly presented in the relevant feedback loop confirmation.</p> <p>Following the publication of the final 2024 ISP, in July 2024 Transgrid requested a feedback loop assessment of HumeLink (full project) against that ISP (being the most recent ISP). The request noted that the total cost, scope and timing of the project were unchanged since the December 2023 assessment. Therefore, AEMO considered the entire cost of HumeLink as stated in the feedback loop request when providing its feedback loop confirmation, consistent with AEMO's December 2023 assessment.</p> |
| 35 | <p>Consideration: In performing the feedback loop on a RIT-T preferred option (if the preferred option, or its cost, differs from the ISP candidate option), AEMO must consider:</p> <ul style="list-style-type: none"> • Removing the ISP candidate option from all development paths where it is featured, and replacing these with the RIT-T preferred option (and associated cost). • Re-running the CBA modelling and scenario analysis if practicable, to test whether the optimal development path referred to in the most recent ISP: <ul style="list-style-type: none"> – still has a positive net economic benefit in the most likely scenario with the RIT-T preferred option; and | <p>For HumeLink (early works), AEMO applied the feedback loop assessment to the early works stage of the HumeLink project by reconsidering the selection of the optimal development path in the most recent ISP. Consistent with the CBA Guidelines, AEMO considered that this required an update of the CBA in the 2022 ISP for all four ISP scenarios using the cost estimates provided in Transgrid's feedback loop request but did not require re-running of the ISP market modelling.</p> <p>AEMO's assessment confirmed that the early works stage of the HumeLink project continued to deliver positive net market benefits in the most likely scenario and aligned with the optimal development path in the 2022 ISP using the same decision making approach, which included updating sensitivity analysis that tested the insurance and option value of project timing. The updated CBA and reasoning</p> |

²² AER. "Regulation of large transmission projects". At <https://www.aer.gov.au/industry/registers/resources/reviews/regulation-large-transmission-projects>

²³ AER. Guidance note: Regulation of actionable ISP projects, March 2021, p.25.

²⁴ AER. Guidance note: Regulation of actionable ISP projects, March 2021, p.28.

| # | CBA Guidelines requirement | AEMO compliance |
|---|--|--|
| | <ul style="list-style-type: none"> <li data-bbox="389 309 738 412">– is still optimal with the RIT-T preferred option under the same decision making approach, or that any difference is immaterial. <li data-bbox="389 483 738 636">• Adapting the extent to which it re-runs the CBA modelling and scenario analysis, to the size of the difference between the costs and/or market benefits of the ISP candidate option and the RIT-T preferred option. | <p data-bbox="778 309 1461 360">supporting selection of the optimal development path was published in a report alongside the feedback loop confirmation.</p> <p data-bbox="778 369 1461 546">For the December 2023 HumeLink (full project) and VNI West feedback loop assessments, the project scope and total cost specified in each feedback loop request were consistent with the respective scope and cost considered in the most recent ISP. Therefore, there was no need to re-run CBA modelling or scenario analysis for these feedback loop assessments because the analysis required for the feedback loop was already completed in the Draft 2024 ISP.</p> <p data-bbox="778 555 1461 680">For the July 2023 Humelink (full project) feedback loop assessment, as the project scope and total cost were consistent with those considered in the most recent ISP, there was no need- to re-run CBA modelling or scenario analysis because the analysis required for the feedback loop assessment was already completed in the final 2024 ISP.</p> |

Glossary and abbreviations

Key terms from the CBA Guidelines

| Term | Definition |
|--|--|
| Actionable ISP project | Defined in NER chapter 10 as a project: <ul style="list-style-type: none"> that relates to a transmission asset or non-network option the purpose of which is to address an identified need specified in an ISP and which forms part of an optimal development path for which a project assessment draft report is required to be published in the ISP that identifies that project. |
| Anticipated project | Anticipated project means a project which: <ul style="list-style-type: none"> does not meet all of the criteria for a committed project; and is in the process of meeting at least three of the criteria for a committed project (as listed in the 'committed project' definition below). |
| Committed project | Committed project means a project that meets the following criteria: <ul style="list-style-type: none"> the proponent has obtained all required planning consents, construction approvals and licenses, including completion and acceptance of any necessary environmental impact statement, construction has either commenced or a firm commencement date has been set, the proponent has purchased/settled/acquired land (or commenced legal proceedings to acquire land) for the purposes of construction, contracts for supply and construction of the major components of the necessary plant and equipment (such as generators, turbines, boilers, transmission towers, conductors, terminal station equipment) have been finalised and executed, including any provisions for cancellation payments; and the necessary financing arrangements, including any debt plans, have been finalised and contracts executed. |
| Consideration | A binding element of the CBA that AEMO must have regard to. |
| Costs | The present value of the direct costs of a credible option or development path. The classes of costs are set out in the NER (clause 5.15A.2(b)(8), 5.15A.3(b)(6), 5.22.8(d)). |
| Counterfactual development path | The status quo or base case that AEMO uses to compare the development paths in the ISP CBA. |
| Cross checks | Cross checks can inform the accuracy of an outcome by 'sense checking' it against information from other sources. |
| Credible option | Defined in NER 5.15.2(a) as being an option (or group of options) that: (1) addresses the identified need; (2) is (or are) commercially and technically feasible; and (3) can be implemented in sufficient time to meet the identified need, and is (or are) identified as a credible option in accordance with paragraphs (b) or (d) (as relevant). |
| Development path | Defined in NER 5.10.2 as a set of projects in an ISP that together address power system needs. |
| Distributional effects | Distributional effects consider the distribution of costs and market benefits of an optimal development path—that is, who receives the benefits and who pays the costs. |
| Future ISP project | Defined in NER 5.10.2 as a project: <ul style="list-style-type: none"> that relates to a transmission asset or non-network option the purpose of which is to address an identified need specified in an ISP and which forms part of an optimal development path that is forecast in the ISP that identifies the project, to be an actionable ISP project in the future. |
| Identified need | Defined in NER chapter 10 as the objective a network service provider or a group of network service providers seeks to achieve by investing in the network in accordance with the NER or an ISP |
| ISP | Defined in NER chapter 10 as a plan developed and published by AEMO under rule 5.22 as amended by an ISP update from time to time. The ISP provides a whole of system plan for the efficient development of the power system that achieves power system needs. It identifies an optimal development path that contains ISP projects, some of which trigger the application of a RIT-T, or preparatory activities. |
| ISP candidate option | Defined in NER 5.10.2 as a credible option specified in the ISP that the RIT-T proponent must consider as part of a RIT-T for an actionable ISP project. |

| Term | Definition |
|------------------------------------|--|
| ISP development opportunity | Defined in NER 5.10.2 as a development identified in an ISP that does not relate to a transmission asset or non-network option and may include distribution assets, generation, storage projects or demand side developments that are consistent with the efficient development of the power system. |
| ISP parameters | Defined in NER 5.10.2 as, for an ISP project: <ul style="list-style-type: none"> the inputs, assumptions and scenarios set out in the most recent IASR; the other ISP projects associated with the optimal development path; and any weightings specified as relevant to that project. |
| ISP project | Defined in NER 5.10.2 as an actionable ISP project, a future ISP project or an ISP development opportunity. |
| ISP update | Defined in NER chapter 10 as an update to an Integrated System Plan published by AEMO under NER 5.22.15. |
| Market benefits | The present value of the benefits of a credible option or development path, or a benefit to those who consume, produce and transport electricity in the market, that is, the change in producer plus consumer surplus. The classes of market benefits are set out in the NER (5.15A.2(b)(4), 5.15A.3(b)(4), 5.22.8(c)). |
| Modelled project | Modelled project means a hypothetical project derived from market development modelling in the presence or absence (as applicable) of the relevant: <ul style="list-style-type: none"> development path (for the ISP), or credible option (for a RIT-T application). |
| Net economic benefit | Net economic benefit equals the market benefits less costs. |
| Non-network option | Defined in NER chapter 10 as 'a means by which an identified need can be fully or partly addressed other than by a network option'. For avoidance of doubt, the AER interprets this definition to mean that non-network options: <ul style="list-style-type: none"> Involve 'non-network assets – that is, assets that are not used to convey or control the conveyance of electricity to customers, and that are not connection assets. For instance, non-network assets might include assets that customers use to reduce their demand for electricity, or assets on which expenditure is undertaken by a third party; or Can also include options that involve some expenditure on a network asset, but not expenditure on network assets alone. |
| Optimal development path | Defined in NER chapter 10 as a development path identified by AEMO as the optimal development path in the most recent ISP in accordance with rule 5.22. |
| Other Party | Any other party than a Participant (where Participant is defined below). |
| Participant | A Registered Participant under NER 2.1 or any other party in their capacity as a consumer, producer or transporter of electricity in the market. |
| Preferred option | Defined in NER 5.15A.1(c) as the credible option that maximises the present value of net economic benefit to all those who produce, consume and transport electricity in the 'market'. |
| Preparatory activities | Defined in NER 5.10.2 as activities required to design and to investigate the costs and benefits of actionable ISP projects and if applicable, future ISP projects including: <ul style="list-style-type: none"> detailed engineering design; route selection and easement assessment work; cost estimation based on engineering design and route selection; preliminary assessment of environmental and planning approvals; and council and stakeholder engagement. |
| Power system needs | The power system needs are, as defined in NER 5.22.3(a): <ul style="list-style-type: none"> the reliability standard; power system security; system standards; and standards or technical requirements in Schedule 5.1 or in an applicable regulatory instrument. |
| Scenario | Different future external market environments that are used in a CBA to assess and manage uncertainty about how the future will develop. They are based on variations to key input variables and parameters that drive supply and demand conditions (for example, population growth, coal and gas prices). |
| Requirement | A binding element of the CBA Guidelines that AEMO must achieve. |

| Term | Definition |
|--|---|
| Risk neutral decision making approach | Risk neutral decision making approaches are based on expected value. That is, they weight different payoffs based on their likelihood of occurrence. In this context, this means weighting the net economic benefit of development paths in each scenario based on the likelihood, or relative likelihood, of the scenario occurring. Risk neutral decision making approaches prioritise transmission investment risks based on their likelihood of occurrence (with judgement used to assess likelihoods). |
| Risk averse decision making approach | Risk averse decision making approaches (implicitly or explicitly) weight different payoffs to reduce variability or the risk of a negative outcome occurring. In this context, this means (implicitly or explicitly) weighting the net economic benefit of development paths in each scenario in a way that mitigates particular risks. Risk averse approaches place a higher value on reducing the risk(s) of a negative outcome occurring than the likelihood of its occurrence. As such, a risk averse decision making approach uses judgement on risk tolerances to prioritise risks. |
| RIT-T | Defined in NER chapter 10 as the test developed and published by the AER in accordance with clauses 5.15A.1 and 5.16.2 as in force from time to time, and includes amendments made in accordance with clause 5.16.2. It is a CBA that assesses credible options to address an identified need, and identifies the credible option that maximises the present value of net economic benefit to all those who produce, consume and transport electricity in the market (the preferred option). |
| Scenario analysis | Scenario analysis entails developing/describing a range of different scenarios and exploring how different development paths produce different market benefits across each scenario. Through this, AEMO gains a comprehensive understanding of what states of the world could arise with and without each development path in place under different sets of external circumstances. Scenario analysis is one way to assess the risk or uncertainty of a given development path, focussing that associated with an unknown future market environment. |
| Sensitivity testing | Sensitivity testing varies one or multiple inputs to test how robust the output of its CBA is to its input assumptions (for example, underlying plant operation assumptions). |
| State of the world | A state of the world is a detailed description of all of the relevant market supply and demand characteristics and conditions likely to prevail to meet the power system needs if a development path proceeds in a given scenario. This includes generation, network and load development and operating requirements. |

Abbreviations

| Abbreviation | Term in full |
|-----------------------|---|
| AEMO | Australian Energy Market Operator |
| AER | Australian Energy Regulator |
| CBA | cost benefit analysis |
| CBA Guidelines | Cost Benefit Analysis Guidelines |
| CDP | candidate development path |
| CPA | contingent project application |
| DER | distributed energy resources |
| DNBP | distribution network service provider |
| FBPG | Forecasting Best Practice Guidelines |
| IASR | Inputs, Assumptions and Scenarios Report |
| ISP | Integrated System Plan |
| NEM | National Electricity Market |
| NEO | National Electricity Objective |
| NER | National Electricity Rules |
| ODP | optimal development path |
| PADR | Project Assessment Draft Report |
| REZ | renewable energy zone |
| RIT-T | regulatory investment test for transmission |
| TAPR | transmission annual planning report |

Glossary

| Abbreviation | Term in full |
|--------------|---------------------------------------|
| TNSP | transmission network service provider |
| VCR | value of customer reliability |
| WACC | weighted average cost of capital |