Final Decision

Ausgrid Electricity Distribution Determination 2024 to 2029

(1 July 2024 to 30 June 2029)

Attachment 5
Capital Expenditure

April 2024

AUSTRALIAN ENERGY REGULATOR

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List of attachments

This attachment forms part of the AER's final decision on the distribution determination that will apply to Ausgrid for the 2024–29 period. It should be read with all other parts of the final decision.

As a number of issues were settled at the draft decision stage or required only minor updates, we have not prepared all attachments. The final decision attachments have been numbered consistently with the equivalent attachments to our draft decision. In these circumstances, our draft decision reasons form part of this final decision.

The final decision includes the following documents:

Overview

Attachment 1 – Annual revenue requirement

Attachment 2 – Regulatory asset base

Attachment 4 – Regulatory depreciation

Attachment 5 – Capital expenditure

Attachment 6 – Operating expenditure

Attachment 7 – Corporate income tax

Attachment 12 – Customer service incentive scheme

Attachment 13 – Classification of services

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Attachment 16 – Alternative control services

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5 Capital expenditure

Capital expenditure (capex) refers to the money required to build, maintain or improve the physical assets needed to provide standard control services (SCS).[1] Generally, these assets have long lives and a distributor will recover capex from customers over several regulatory control periods. A distributor's capex forecast contributes to the return of and return on capital building blocks that form part of its total revenue requirement.

Under the regulatory framework, a distributor must include a total forecast capex that it considers is required to meet or manage expected demand, comply with all applicable regulatory obligations, and to maintain the safety, reliability, quality, and security of its network and contribute to achieving emissions reduction targets (the capex objectives).[2]

We must decide whether or not we are satisfied that this forecast reasonably reflects prudent and efficient costs and a realistic expectation of future demand and cost inputs (the capex criteria).[3] We must make our decision in a manner that will, or is likely to, deliver efficient outcomes in terms of the price, quality, safety, reliability and security of supply, and to achieve targets for reducing Australia's greenhouse gas emissions that benefit consumers in the long term (as required under the National Electricity Objective (NEO)).[4]

The *AER capital expenditure assessment outline* explains our and distributors' obligations under the National Electricity Law and Rules (NEL and NER) in more detail.[5] It also describes the techniques we use to assess a distributor's capex proposal against the capex criteria and objectives.

Total capex framework

We analyse and assess capex drivers, programs and projects to inform our view on a total capex forecast. However, we do not determine forecasts for individual capex drivers or determine which programs or projects a distributor should or should not undertake. This is consistent with our *ex-ante* incentive-based regulatory framework and is referred to as the 'capex bucket'.

Once the *ex-ante* capex forecast is established, there is an incentive for distributors to provide services at the lowest possible cost, because the actual costs of providing services will determine their returns in the short term. If distributors reduce their costs, the savings are shared with consumers in future regulatory control periods. This incentive-based framework provides distributors with the flexibility to prioritise their capex program given their circumstances and due to changes in information and technology.

Distributors may need to undertake programs or projects that they did not anticipate during the reset. Distributors also may not need to complete some of the programs or projects proposed if circumstances change, these are decisions for the distributor to make. We

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1 These are services that form the basic charge for use of the distribution system.

2 NER, cl. 6.5.7(a).

3 NER, cl. 6.5.7(c).

4 NEL, ss. 7, 16(1)(a).

5 AER, *Capex assessment outline for electricity distribution determinations*, February 2020.

consider a prudent and efficient distributor would consider the changing environment throughout the regulatory control period and make decisions accordingly.

Importantly, our decision on total capex does not limit a distributor's actual spending. We set the forecast at a level where the distributor has a reasonable opportunity to recover its efficient costs. Distributors may spend more or less than our forecast in response to unanticipated changes.

Assessment approach

We provide guidance on our assessment approach in several documents, including the following which are of relevance to this decision:

- AER's *Expenditure Forecast Assessment Guidelines*[6]
- Regulatory Investment Test for Distribution and Transmission (RIT-D and RIT-T) Guidelines[7]
- AER's *Asset Replacement Industry Note*[8]
- AER's *Information and Communication Technologies (ICT) Guidance Note*.[9]
- AER's *Distributed Energy Resources Integration Expenditure Guidance Note*.[10]
- AER's Guidance Note on Network Resilience[11]
- *AER's Guidance on amended National Electricity Objective*[12]

We also had regard to the guiding principles in the AER's *Better Resets Handbook – Towards consumer centric proposals* which encourages networks to develop high quality, well-justified proposals that genuinely reflect consumers' preferences.[13]

Our final decision has been based on the information before us, which includes:

- the distributor's regulatory proposal and accompanying documents and models
- the distributor's responses to our information requests
- stakeholder comments in response to our Issues Paper.

5.1 Final decision

Our final decision is that we are not satisfied that Ausgrid's proposed total forecast capex of $3,069.4 million ($2023–24) reasonably reflects prudent and efficient costs to meet the

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6 AER, *Expenditure Forecast Assessment Guideline 2013*, August 2022.

7 AER, *RIT-T and RIT-D application guidelines (minor amendments) 2017*, September 2017.

8 AER, *Industry practice application note for asset replacement planning*, January 2019.

9 AER, *AER publishes guidance on non-network ICT capital expenditure assessment approach*, November 2019.

10 AER, *Distributed energy resources integration expenditure guidance note*, June 2022.

11 AER, *A guidance note on network resilience*, April 2022.

12 AER, *Guidance on amended National Electricity Objective*, September 2023.

13 AER, *Better Resets Handbook – Towards consumer-centric network proposals*, December 2021.

capex objectives.[14] [15] Our substitute forecast is $2882.7 million which is 6.1% below Ausgrid's forecast.

We consider this forecast will provide for a prudent and efficient service provider in Ausgrid's circumstances to meet the capex objectives. Table 5.1 outlines our substitute estimate of forecast capex and compares this to Ausgrid's proposed forecast capex.

Table 5.1 AER's final decision on Ausgrid's total net capex forecast ($ million, $2023–24)

	2024–25	2025–26	2026–27	2027–28	2028–29	Total
Ausgrid's revised proposal[(a)]	671.1	615.1	632.6	596.8	553.9	3,069.4
AER's final decision	642.2	578.0	590.3	556.1	516.1	2,882.7
Difference ($)	**-28.8**	**-37.1**	**-42.3**	**-40.7**	**-37.8**	**-186.7**
Difference (%)	**-4.3%**	**-6.0%**	**-6.7%**	**-6.8%**	**-6.8%**	**-6.1%**

Source: Ausgrid capex model and AER analysis.
Note: (a) For like for like comparison, $131 million of SaaS costs are excluded.
Numbers may not sum due to rounding.

5.2 Ausgrid's revised proposal

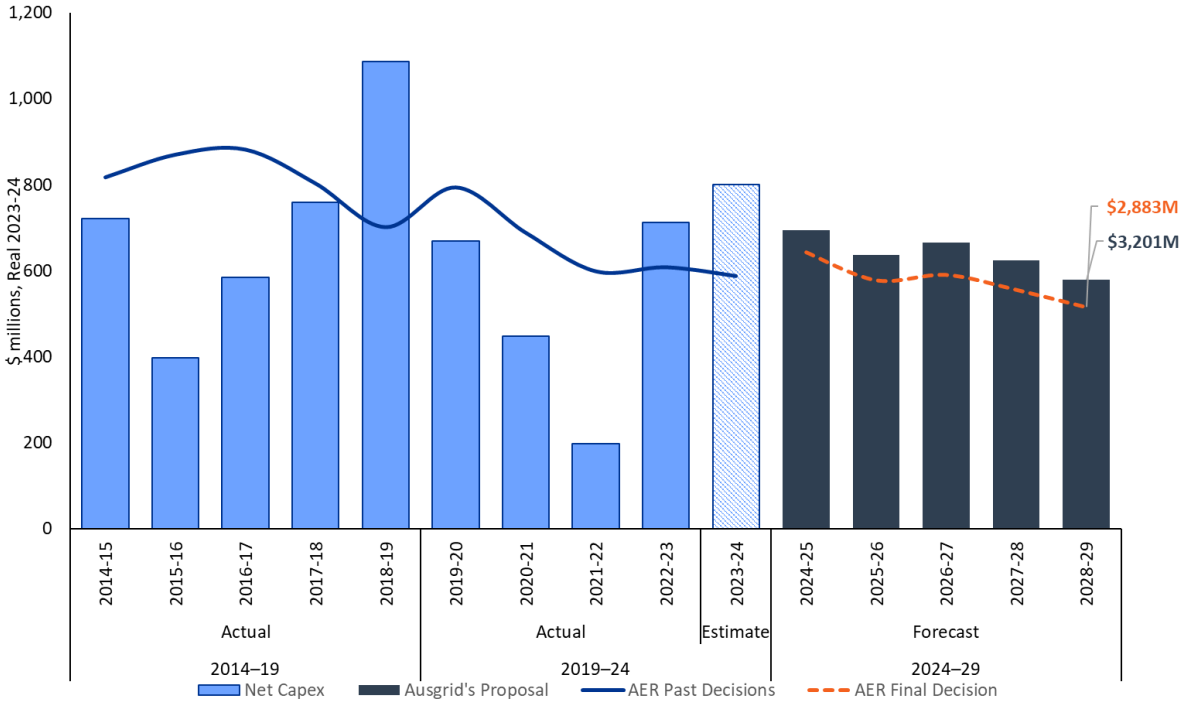
Ausgrid's proposal forecasts $3,069.4 million ($2023–24) capex over the 2024–29 regulatory control period. This amount excludes $131.2 million of software as a service (SaaS) costs Ausgrid proposed to recategorise from opex to capex.

Figure 5.1 outlines Ausgrid's historical capex trend, its proposed forecast for the 2024–29 regulatory control period, and our final decision. Consistent with our usual practice, the chart presents time-series of Ausgrid's net capex. As can be seen, despite a step up in its expected spend in the last two years of the current period, Ausgrid is expecting a material underspend in the 2019–24 period. The main driver of the underspend is the non-system land asset disposals, where there is a large increase in actual asset disposals compared to the forecast asset disposals in the 2019–24 period. This is not an underspend we typically see. Generally, businesses underspend on categories of capex. As capex is assessed on a net capex basis (gross capex minus asset disposals and capital contributions), Ausgrid's larger than expected asset disposals in the current period has a material impact on the net capex comparison.

14 Excludes $131 million of software as a service (SaaS) costs.

15 Ausgrid amended its revised capex forecast confirming an $8 million capitalised overheads reporting error on 22 January and withdrew $12 million of repex on 16 February.

Figure 5.1 Ausgrid's historical and forecast capex ($ million, $2023–24)



Source: AER analysis. Capex is net of asset disposals and capital contributions.
Note: Ausgrid's Proposal includes $131 million of SaaS costs.

Ausgrid submits that it has accepted most of the AER's draft decision on capex and made reductions in other parts of its total forecast, although its revised proposal forecast is in line with its initial proposal. This is because while it made reductions in cyber security capex (and opex), ICT, resilience, CER, and some parts of repex, it also increased its proposal in other parts including updated costs for repex and recategorised SaaS costs from opex to capex. Also, Ausgrid's revised proposal includes $34 million for non-recurrent ICT that was not included in its initial proposal due to an escalation error, which we can confirm is a valid error.

Since submitting its revised proposal, Ausgrid has provided updates to its total net capex forecast. We refer to this updated forecast as "Forecast assessed" to account for Ausgrid's change to its revised capex forecast, where it withdrew $12 million from repex[16], and confirmed an $8 million reporting error in its capitalised overheads with a resubmitted capex model.[17]

5.3 Reasons for final decision

We are satisfied that our alternative forecast of total capex of $2,882.7 million is reasonable and sufficient for Ausgrid to maintain its network. This is because we have accepted most of its recurrent expenditure forecast which makes up the majority of the total capex forecast.

16 Ausgrid, *Letter to the AER – Amendments to Revised Proposal*, 16 February 2024.

17 Ausgrid, Response to information request 058 – Capex Reconciliation, 15 January 2024, p. 2.

Overall, we found that the majority of Ausgrid's forecast of $3,069.4 million would be required to meet the capex objectives. We have not accepted Ausgrid's forecast in full, reducing it by 6.1%, because of the differences in our forecasts in mostly new and emerging areas of capex - climate resilience, CER and innovation – as well as in its dedicated LV reconfiguration program. While we agree with Ausgrid that some level of investment is prudent, Ausgrid did not provide sufficient information to demonstrate that its preferred option is efficient. For new and emerging areas of network resilience, CER and explicit ex-ante innovation funding, our assessment of proposals takes account of the limitations and challenges in forecasting these areas of expenditure. At the same time, in such an uncertain environment, we consider it important to be clear about the type of evidence expected to support these proposals. This will ensure that investments are in the long-term interests of consumers.

Our reduction of 6.1% to Ausgrid's revised capex forecast compared to our draft decision of 17% reflects Ausgrid's efforts in responding to our draft decision by providing further supporting information and submitting lower forecasts especially in the areas of non-recurrent ICT and cyber security.

Our engagement with Ausgrid post submission of its revised proposal also assisted in the narrowing of areas of possible contention. For instance, Ausgrid withdrew $12 million from its repex forecast due to our preliminary findings that some of Ausgrid's updated increased repex costs was not likely over the forecast period. Ausgrid also provided a revised set of triggers for the Macquarie Park contingent project in response to our concerns about the workability of its initial proposed triggers.

More generally, we acknowledge Ausgrid's extensive customer engagement on its capex proposal. Several submissions, including the RCP, CCP26, and PIAC, noted Ausgrid's efforts to engage on aspects of its capex proposal. PIAC noted:[18]

> Relative to the other NSW DNSPs Ausgrid's engagement program was the most consistently deliberative in structure, an approach which invested significant time and resources to provide consumers with the foundation and the scope to build genuine preferences and express them meaningfully to Ausgrid.

The RCP also notes that because Ausgrid has listened and responded meaningfully to customers views it believes that Ausgrid's revised capex proposal is capable of acceptance, if the AER finds the revised capex and opex step changes are prudent and efficient.[19]

The CCP26 submits that Ausgrid's post-lodgement engagement was successful in drawing out customer preferences, particularly in light of evolving community expectations in a net-zero transition and the cost-of-living pressures facing its customers.[20] However, it also noted that Ausgrid's revised proposal included new areas of expenditure – a Heat Resilience project within Ausgrid's network resilience proposal, a new Macquarie Park contingent project and updated higher repex costs. It considers that the relatively late introduction of

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18 PIAC, *Finalised PIAC submission to the AER Draft Decision 2024–29 revenue determination NSW DNSPs*, 19 February 2024, p. 6.

19 RCP, *RCP report on Ausgrid Revised Proposal*, 29 November 2023, p. 3.

20 CCP26, Submission to the Australian Energy Regulator's Draft Decision and Ausgrid's Revised Regulatory Proposal, January 2024, p.3.

these expenditure proposals has impacted the quality of engagement and left some issues unresolved. We encourage Ausgrid to consider this area of improvement in future consumer engagement processes.[21]

Table 5.2 sets out our final decision for Ausgrid by capex category.

Table 5.2 AER's final decision by capex category ($million, $2023–24)

Category	Ausgrid Revised Proposal[(a)]	AER Final Decision
Replacement	1,416.4	1,389.7
Network resilience	113.7	38.1
Augex	139.6	139.6
Connections	51.9	51.9
Operational Technology and Innovation	104.9	75.7
Consumer Energy Resources	45.3	29.1
Information and Communication Technology	264.5	264.5
Fleet	147.2	147.2
Property	144.8	144.8
Capitalised overheads	723.7	690.7
Total capex (excluding capital contributions)	**3,152.1**	**2,971.3**
Less Disposals	82.6	82.6
Less Modelling adjustments	0.0	6.0
Net capex (without SaaS costs)	**3,069.4**	**2,882.7**

Source: Ausgrid capex model and AER analysis.

Note: (a) For like for like comparison, $131 million of SaaS costs are excluded.
Numbers may not sum due to rounding. Modelling adjustments relate to updates to the consumer price index (CPI) and real cost escalation assumptions (including the exclusion of external contract labour cost escalation

Table 5.3 summarises, and Appendix A provides further details on, the reasons for not accepting Ausgrid's forecast, by capex driver. This reflects the way we have assessed Ausgrid's total capex forecast. A number of capex categories were considered and accepted in our draft decision and are reflected in this table but should be read in conjunction with our draft decision.[22] Further detail and reasons on the remaining capex categories – non-recurrent ICT, cyber security expenditure, climate resilience, innovation expenditure, CER, dedicated LV circuit reconfiguration capex, updated repex costs and capitalised overheads – that we further considered in response to Ausgrid's revised proposal are contained in Appendix A. Appendix B sets out our final decision on Ausgrid's proposed Macquarie Park contingent project.

Our findings on each capex driver are part of our broader analysis and should not be considered in isolation. We do not approve an amount of forecast expenditure for each individual capex driver or project/program. However, we use our findings on the different

21 CCP26, Submission to the Australian Energy Regulator's Draft Decision and Ausgrid's Revised Regulatory Proposal, January 2024, p.4.

22 AER, *Draft Decision, Ausgrid – Electricity Distribution Determination 2024 to 2029, Attachment 5 Capital Expenditure*, September 2023.

capex drivers to assess a regulated business' proposal as a whole and arrive at a substitute estimate for total capex where necessary. Our decision on total capex does not limit a regulated business' actual spending.

Table 5.3 Summary of our findings and reasons, by capex driver

Driver	Findings and reasons
Repex	Our final decision does not include Ausgrid's forecast for repex in the total capex forecast. We found most aspects of Ausgrid's repex forecast to be reasonable. As noted in our draft decision, Ausgrid's modelled repex forecast performs well against the repex model. However, we continue to have concerns with Ausgrid's forecast for its dedicated LV circuit reconfiguration program, and do not consider that it reasonably reflects the capex criteria. Overall, we found that Ausgrid has provided information to support the prudency of investment for this program. However, it did not provide sufficient evidence in the efficiency of its forecast of $80.5 million, which is a 105% step up from a current period spend of $39 million. These issues are discussed further in Appendix A.6. We also accepted the most of Ausgrid's updated increase to its repex costs for major projects. This is discussed further in Appendix A.7.
Augex	We have included Ausgrid's augmentation expenditure in the total forecast capex. This was considered and accepted in our draft decision.
Connections	We have included Ausgrid's connections expenditure in the total forecast capex. This was considered and accepted in our draft decision.
Fleet	We have included Ausgrid's fleet expenditure in the total forecast capex. This was considered and accepted in our draft decision.
Property	We have included Ausgrid's property expenditure in the total forecast capex. This was considered and accepted in our draft decision.
ICT	We have included Ausgrid's proposed ICT forecast in the total expenditure forecast. We are satisfied with Ausgrid's responses in its revised proposal to concerns we raised in our draft decision about its non-recurrent ICT forecast, in particular its Enterprise Resourcing Planning program. Our final decision is set out in Appendix A.1.
Cyber security	We have included Ausgrid's proposed cyber security forecast in the total expenditure forecast. We are satisfied with Ausgrid's responses in its revised proposal to concerns we raised in our draft decision about its cyber security forecast. Our final decision is set out in Appendix A.2.
Resilience	We have not included Ausgrid's proposed climate resilience forecast of $119.6 million in the total expenditure forecast. Our alternative forecast of $41.3 million includes $3.4 million for community resilience, accepting Ausgrid's forecast for that component of its climate resilience program. We acknowledge Ausgrid's efforts to adhere to our network resilience guidance note. We also appreciate that Ausgrid has undertaken an extensive and ambitious customer engagement process in a new area of expenditure. We note that climate resilience is an important issue to consumers as reflected in the many submissions received from stakeholders about Ausgrid's climate resilience proposal. The main area of contention was Ausgrid forecast for its network solutions in the three Local Government Areas (LGA) which represents about 75.5% of its climate resilience proposal. Ausgrid submitted a bottom-up model and a top-down model – cost benefit models of the proposed network solutions. We commend Ausgrid on its efforts to address our concerns about its initial bottom-up model, and found its new models to be transparent, and well-documented. However, we found concerns with assumptions in its bottom-up and top-down models, which meant that we did not have confidence that its model outcomes/proposed investments were prudent and efficient and therefore in the long term interests of consumers. We consulted with Ausgrid about our concerns with its forecasting methodology, giving it the opportunity respond and provide additional evidence on our proposed adjustments to the Ausgrid models. Having regard to the information before us, we concluded that Ausgrid has provided supporting information to demonstrate climate resilience investment, however, Ausgrid did not provide sufficient evidence to support the prudency and efficiency of its revised total proposed climate resilience investment. Our final decision is detailed in Appendix A.3.

CER Integration	We have not included Ausgrid's proposed CER forecast in the total forecast capex. While we accepted Ausgrid's forecast for rooftop solar integration, we found that its modelling assumptions for its EV integration to be conservative, overstating the necessary expenditure to manage the integration. In coming to our position, we have had regard to Ausgrid's estimated emissions reduction benefits in its proposal. Our reasons for this are set out in Appendix A.4.
Network Innovation Program (NIP)	We have not included Ausgrid's proposed network innovation program forecast in the total expenditure forecast. We acknowledge the need for ex-ante innovation funding for trials and pilots to test and explore new ideas, concepts and technology before committing to implementing of solutions and rolling these into business-as-usual activities. We appreciate Ausgrid's efforts to respond to information gaps noted in our draft decision, and additional modelling to support its proposal. We also note its estimated emission reduction benefits in a number of its proposed projects in the NIP. We agree with Ausgrid that there is a need for some level of ex-ante innovation investment, but Ausgrid did not provide sufficient evidence to support its forecast of $49.2 million. Our final decision sets our approach to assessing future innovation proposals which includes the criteria that has been applied to assess Ausgrid's NIP. Further information can be found in Appendix A.5.
Capitalised overheads	We have included an alternative forecast for Ausgrid's capitalised overheads in the total forecast capex. This is to account for Ausgrid's 2022-23 actual expenditure, data discrepancies and our substitute estimate of total direct capex which includes the exclusion of SaaS costs from capex. Further information can be found in Appendix A.8.
Asset disposals	We have included Ausgrid's asset disposal forecast in the total forecast capex.
Customer contributions	We have included Ausgrid's customer contributions forecast in the total forecast capex.
Macquarie Park contingent project	We accept Ausgrid's proposed Macquarie Park contingent project because we consider it is probable for Ausgrid to receive connection request(s) for additional load during the 2024–29 period that its existing infrastructure cannot supply in the Macquarie Park network. Should this event occur, we also accept that Ausgrid would be reasonably required to incur additional expenditure in order to achieve the capex objectives. We have also accepted Ausgrid's amended triggers for this contingent project. Further information can be found in Appendix B.
SaaS costs	Our final decision does not include SaaS costs in the total forecast capex. The reasons for this are in Attachment 6 – opex.

A Reasons for decision on key capex categories

This appendix sets out our assessment of key capex categories and programs/projects within Ausgrid's total capex forecast and the reasons for our decision. This appendix includes:

- Non-recurrent ICT (A.1)
- Cyber security (A.2)
- Resilience (A.3)
- CER Integration (A.4)
- Innovation (A.5)
- LV dedicated circuit reconfiguration (A.6)
- Updated repex costs (A.7)
- Capitalised overheads (A.8)
- Modelling adjustments (A.9)

A.1 Non-recurrent ICT (ERP replacement program)

A.1.1 AER's final decision

We accept that Ausgrid's revised forecast capex of $58.9 million for the ERP replacement program would form part of a total capex forecast that reasonably reflects the capex criteria.

This means that our final decision accepts Ausgrid revised proposal of $272.6 million for total ICT (recurrent and non-recurrent).[23]

Our final decision on Ausgrid's CER-related ICT, ICT and OTI cyber security are discussed in appendices A.4 and A.2, respectively, while the ERP replacement is discussed in this appendix.

Our final decision is to also treat Software-as-a-Service (SaaS) costs as opex, consistent with our draft decision. This is discussed in Attachment 6 - opex.

A.1.2 Ausgrid's proposal

Ausgrid proposed a total ICT revised capex forecast of $272.6 million, which is split into $105.7 million for recurrent ICT and $166.9 million for non-recurrent ICT.[24] The total ICT forecast in Ausgrid's revised proposal is $28.5 million lower than its initial proposal and $65.3 million higher than our draft decision.

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23 We assessed CER-related ICT within the "CER integration" program. As presented in Table 5,2, the total of Ausgrid's remaining ICT forecast is $264.5 million, which we accept (excluding CER-related ICT).

24 Ausgrid, *Revised proposal - Att 5.9 – Technology plan for 2024–29,* 30 November 2023, p. 36.

Ausgrid proposed three main non-recurrent programs totalling $112 million for capex, as shown in Table A.1. We have assessed these programs in different appendices.

Table A.1 Ausgrid's revised non-recurrent ICT programs ($ million, $2023–24)

Program	Capex	Opex	Totex	Section reference
CER-related ICT	18	3	21	Section A.4
Cyber security	35	35	70	Section A.2
Enterprise Resource Planning Program (ERP) replacement	59	59	118	Section A.1.3.1

Source: Ausgrid's revised proposal.

Note: Our draft decision accepted Ausgrid's proposal to treat software-as-a-service (SaaS) implementation costs as opex. However, in its revised proposal, Ausgrid proposed to treat SaaS ICT opex as capex as an affordability measure. This topic is discussed in Attachment 6 for operating expenditure.

In its submission to Ausgrid's revised proposal, the Public Interest Advocacy Centre (PIAC) noted that Ausgrid progressed robust governance arrangements within its ICT program. It also noted its support for Ausgrid's affordability measures including longer depreciation of its ICT investment and a commitment to remove contingency amounts in its ERP program.[25]

The RCP also submitted that it supports Ausgrid's affordability measures relating to the ERP program including longer depreciation and not seeking additional investment for foreseeable overruns.[26] It also noted support for Ausgrid committing to undertake post implementation reviews of the ERP program and CER-related ICT investment.[27]

A.1.3 Reasons for decision

We have reviewed the information Ausgrid provided in support of its non-recurrent ICT revised capex forecast, including the business cases and cost-benefit models. Where required, we have sought further information from Ausgrid through information requests. We also had regard to analysis provided by EMCa for our draft decision where we considered this was applicable.

Our final decision focussed on the non-recurrent ICT programs and in particular, the ERP program. We found Ausgrid's approach to forecasting recurrent ICT to be reasonable and noted that Ausgrid has forecast a decrease in recurrent ICT capex.

We are satisfied that Ausgrid's revised ERP program is prudent and efficient. We discuss our assessment of ERP program below. We discuss the interrelated opex in Attachment 6 including our decision on how to treat SaaS ICT expenses.

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25 PIAC, *Draft decision 2024–29 revenue determination: Ausgrid, Endeavour, and Essential Energy*, 19 February 2024, p. 6.

26 RCP, *Submission on Ausgrid's revised proposal and draft decision 2024–29*, January 2024.

27 RCP, *Submission on Ausgrid's revised proposal and draft decision 2024–29*, January 2024.

A.1.3.1 Enterprise resource planning replacement program

As Table A.2 shows, Ausgrid proposed $117.7 million in totex for the ERP program and is split evenly between capex and opex. Ausgrid's revised forecast capex is $28.8 million lower than Ausgrid's initial proposal and $54.7 million higher than our draft decision.

Table A.2 Ausgrid's 2024-29 ERP upgrade revised proposal ($2024 real, million)

	Initial proposal – corrected (from revised proposal) [28]	Draft decision	Revised proposal
Capex	87.6	4.1	58.9
Opex((Saas)	87.6	12.0	58.9
Totex	**175.3**	**16.1**	**117.7**

Source: Ausgrid's revised proposal and AER analysis.
Note: Numbers may not sum due to rounding.

Ausgrid considered 3 options for its ERP upgrade and included capex for its preferred option 2 in its initial proposal. After finding some issues with Ausgrid's cost benefit analysis, we included capex for option 1 in our draft decision. Option 1 is a technical upgrade that provides Ausgrid with business-as-usual system functionality. Option 2 is a technical upgrade (option 1) plus a major system transformation.

Namely, our draft decision outlined the following concerns:[29]

- Modelling bias – In its Net Present Value (NPV) analysis, Ausgrid modelled opex savings benefits beyond the asset life (to 50 years) while assuming no ongoing replacement costs.
- Deliverability – Ausgrid planned to deliver all components of the program within the 2024–29 period at the same time. This presented risk that critical components will not be delivered on time.
- Contingencies – Ausgrid included 20–40% contingency costs to derive its forecast expenditure, which is not consistent with our expenditure forecast assessment guideline.

We encouraged Ausgrid to consider our feedback and re-visit its cost-benefit analysis in the revised proposal. As we describe below, we consider Ausgrid has addressed our concerns in the draft decision.

Ausgrid accepted the feedback in our draft decision and reiterated its preference for investment option 2. In its revised proposal, Ausgrid adjusted parameters in its NPV model to address our concerns, such as curtailing opex benefits to 15 years in line with the assumed

[28] In its revised proposal, Ausgrid noted an escalation error with its initial proposal totex amount for the ERP upgrade. The initial proposal included $150.1 million in totex for the 2024–29 regulatory period when it should have been $175.3 million. We verified the escalation error with Ausgrid. In our final decision we compare Ausgrid's revised ERP upgrade forecast to the corrected initial proposal forecast as part of our assessment.

[29] AER, *Ausgrid 2024–29 – Draft Decision – Attachment 5 – Capital* Expenditure, September 2023, pp. 15-16.

asset life.[30] Ausgrid also explained that it made an error in its initial proposal NPV model, which included capex benefits for six years.[31] Ausgrid therefore increased the duration of its capex benefits to 15 years to align with the assumed asset life. We consider it is reasonable to assume the capex benefits associated with the ERP upgrade would also be realised for the duration of the asset life.

To mitigate deliverability risk, Ausgrid proposed to stage the project and extend the delivery timetable from five to seven years.[32] This approach would address the technical upgrade first and sequence the transformation activities later in the 2024-29 period and into the 2029-34 period. Ausgrid submitted that this approach will allow for longer periods to embed the changes that the program will deliver.[33]

We consider Ausgrid's proposed extended delivery timeline mitigates deliverability risk by removing overlap between the core technical upgrade and transformation activities. It also allows more time to address any issues that may arise between major tasks.

Ausgrid also removed the contingency costs for its option 2 forecast. Removing contingency costs and extending the delivery timeline reduced Ausgrid's forecast totex for the 2024-29 period by $57.6 million. This includes shifting $34.2 million into the 2029-34 period.

A.2 Cyber security

A.2.1 AER's final decision

We accept that Ausgrid's revised total expenditure forecast of $101.9 million ($66.5 million in capex and $35.4 million in opex for cyber security) would form part of a total expenditure forecast that reasonably reflects the expenditure criteria.

We also accept its opex step change of $18.1 million for new specialist skills and training programs.

A.2.2 Ausgrid's proposal

Ausgrid proposed $70.2 million totex ($34.8 million capex and $35.4 million in SaaS costs) for Information Communication and Technology (ICT) cyber security and $31.7 million capex for Operational Technology (OT). Its revised totex proposal of $101.9 million is 22% lower than its initial proposal of $130.2 million.

Ausgrid also proposed an opex step change of $18.1 million, lower than its initial proposal of $20.6 million and our draft decision of $19.0 million.

As supporting material, Ausgrid provided a business case, cost-benefit model, and qualitative and quantitative risk assessments.

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30 Ausgrid, *2024–29 Revised proposal – Attachment 5.9.1 – ERP Upgrade Program*, 30 November 2023, p. 3.

31 Ausgrid, *Response to information request 062 – ICT ERP upgrade, 16 January 2024, p. 3.*

32 Ausgrid, *2024–29 Revised proposal – Attachment 5.9.1 – ERP Upgrade Program*, 30 November 2023, p. 41.

33 Ausgrid, *2024–29 Revised proposal – Attachment 5.9.1 – ERP Upgrade Program*, 30 November 2023, p. 41.

Table A.3 outlines Ausgrid's revised cyber security totex (capex + opex SaaS) proposal and compares this with Ausgrid's initial proposal and our draft decision.

Table A.3 Ausgrid's 2024-29 Cyber Security revised proposal ($2024 real, million)

	Initial Proposal	Draft Decision	Revised Proposal
ICT Cyber Security Capex	44.4	25.0	34.8
ICT Cyber Security Opex (SaaS)	46.4	27.0	35.4
ICT Totex	**90.8**	**52.0**	**70.2**
OT Security Program	26.0	12.5	18.3
Control System Core Refresh	13.4		13.4
OT Capex	**39.4**	**12.5**	**31.7**
Totex	**130.2**	**64.5**	**101.9**
Opex Step Change	20.6	19.0	18.1

Source: AER draft decision and Ausgrid's initial and revised proposals.
Note: The Opex Step Change is included in the ICT Cyber Security Opex line.

Ausgrid submitted it achieved the reductions in its revised proposal by re-prioritising the cyber risk program and by applying new knowledge from recently completed and in-flight programs.[34]

Ausgrid submitted that it continues to consider Security Profile 3 (SP-3) an appropriate maturity target based on its criticality under the Australian Energy Sector Cyber Security Framework (AESCSF), which recommends a maturity level of SP-3 for high criticality market participants.[35]

ICT cyber security expenditure

For ICT cyber security, Ausgrid's revised totex forecast of $70.2 million is 22.7% lower compared to its initial proposal due to:

- a revised lower capex forecast of $34.8 million that is 21.6% lower than its initial proposal; and
- a revised lower SaaS forecast of $35.8 million that is 23.7% lower than its initial proposal.

Ausgrid submitted that it considered three options:

- Option 1: Maintain the current level of cyber security maturity which would meet its regulatory obligations at the SP–1 level. This option has totex of $16.2 million and a reported net present value (NPV) of -$57.1 million;

34 Ausgrid, *Attachment 5.9.2 – Cyber security program – 30 November 2023*, p. 2.

35 Ausgrid, *Attachment 5.9.2 – Cyber security program – 30 November 2023*, p. 2.

- Option 2: achieve security practices at the SP–2 level. This option has totex of $55.9 million and a reported NPV of $23 million; and
- Option 3: achieve security practices at the SP–3 level (Ausgrid's preferred option). This option has totex of $70.2 million (including the opex step change of $18.1 million) and a reported NPV of $152 million.

Ausgrid stated that the principal difference between the three levels of maturity is that each level provides progressively greater maturity and mitigation against potential cyber incidents.[36]

Recurrent OT cyber security

For OT cyber security, Ausgrid's revised capex forecast of $31.7million is 19.5% lower compared to its initial proposal.

Ausgrid proposed two cyber security programs for recurrent OT capex:

- Control system core refresh program ($13.4 million), comprising 5 projects; and
- Operational technology security program ($18.3 million) comprising 20 projects.

Ausgrid submitted that its lower capex forecast for OT cyber security was partly driven by deferring an OT communications system upgrade.[37]

Opex step change

Ausgrid submitted that its proposed opex step change of $20.6 million was reduced to $18.1 million due to a lower ongoing opex forecast associated with the reduction in the capex program.[38]

Ausgrid submitted that the opex step change of $18.1 million is driven by the need for resources with specialist skills, further protection through new cyber security capability and investing in cyber awareness training programs for staff to protect themselves and the organisation from cyber-attacks.[39]

A.2.3 Reasons for decision

We recognise the importance of cyber security investment in supporting a reliable and secure electricity network. We have had regard to the increasing threat landscape and uncertainty.

However, we do not consider that Ausgrid's SP-3 level target is a regulatory obligation.

Our final decision to accept Ausgrid's revised totex forecast for cyber security reflects our assessment that while Ausgrid has not established that it has a regulatory obligation to

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36 Ausgrid, *Attachment 5.9.2 – Cyber security program – 30 November 2023*, p. 22.

37 Ausgrid, *Attachment. 5.8.2 – Operational Technology core refresh and security programs – 30 Nov 2023 – Public*, p. 6.

38 Ausgrid, *Attachment 5.9.2 – Cyber security program – 30 November 2023*, p. 3.

39 Ausgrid, *Attachment 5.9.2 – Cyber security program – 30 November 2023*, p. 28.

achieve SP-3,[40] our review of its revised proposal confirmed that its preferred option results in the greatest overall net economic benefit. We provide further detail about our assessment below.

In response to our draft decision, Ausgrid's RCP submitted that it supports Ausgrid's proposal because Ausgrid's consumer engagement shows a clear preference for the highest security level, with the AER to assess the prudent and efficient costs of achieving that protection. It also submitted that it has concerns with the AER's consultant, EMCa's, assessment of Ausgrid's proposal. The RCP stated that EMCa's finding that Ausgrid's proposal is not prudent and efficient seems anomalous with its position on Transgrid's cyber security expenditure proposal that was targeting SP-3 and that EMCa has been unclear in its findings.[41]

The AER has not been inconsistent in its assessment of cyber security expenditure for Transgrid and Ausgrid. We agree with EMCa that the AESCSF does not create an obligation for any NSP and, as noted by AEMO, is intended to provide guidance only to NSPs and other stakeholders. Thus, we take the view, consistent with EMCa's position, that in the absence of compliance of a regulatory obligation, an assessment of the economic case for the cyber security proposal is required.

The key reason for EMCa's findings on Ausgrid's proposal was the lack of justification provided for its cost build-up, and overstated benefits identified in achieving SP-3. In particular, EMCa concluded that achieving Ausgrid's proposed SP level could potentially be justified where there is a net positive outcome through a lower cost than what Ausgrid had proposed.[42] This is why, for the draft decision, we considered it prudent for Ausgrid to adopt a risk prioritisation-based approach, that provides significant risk reductions (benefits) through a more targeted cyber security maturity uplift in the 2024-29 period. This is, in contrast, to Transgrid which, in the context of its determination, provided sufficient justification of the prudency and efficiency of its proposed cyber security investment.

ICT cyber security

We acknowledge Ausgrid's efforts in responding to our draft decision. Ausgrid notes that it reduced its ICT cyber security forecast by taking into account delivery of its FY2023 and FY2024 program to date and its annual review of its strategic plan.[43]

Ausgrid stated that it uses the AESCSF framework and is rated as a 'High' criticality service provider within this framework.[44] We note that AEMO states that the criticality assessment

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40 AEMO, *Australian Energy Sector Cyber Security Framework – Framework Overview – 2022 Program*, 2022, p. 3. AEMO indicates that the criticality assessment tool should be treated as guidance only and is not an indication an entity has obligations under or is compliant with the applicable Commonwealth legislation

41 Ausgrid Reset Customer Panel, *RCP Report on Ausgrid Revised Proposal*, p. 37.

42 EMCa, *Review of Proposed Expenditure on ICT Cyber Security, Ausgrid 2024 to 2029 Regulatory Proposal*, August 2023, p. 33, paragraph 161.

43 Ausgrid, *Attachment 5.9.2 – Cyber security program – 30 November 2023*, p. 3.

44 Ausgrid, *Attachment 5.9.2 – Cyber security program – 30 November 2023*, p. 7.

tool should be treated as guidance only and is not an indication an entity has obligations under or is compliant with the applicable Commonwealth legislation.[45]

In the absence of a regulatory obligation, we considered the economic case for Ausgrid's proposed investment in cyber security. Overall, we found that once we made adjustments for some of Ausgrid's modelling assumptions, our alternative forecast was close to Ausgrid's preferred option and presents the highest NPV. More specifically, we made adjustments on the following modelling issues:

- The average increase in length of an unplanned outage from 48 hours to 24 hours - We consider Ausgrid overstated the average increase in length of an unplanned outage. This in turn overstated the avoided cost and therefore the benefit of mitigating the risk.[46] We also found overstated inputs for the likeliness of a cyber related event occurring and the cost avoided in rectifying the outcome of the event; [47]
- Inclusion of an unrealistic opex cost - In its NPV analysis, Ausgrid calculated the capital and initial operating expenditure costs over five years and the benefits of the program over 11.[48] This is in line with what we would expect to see for an ICT related program. However, Ausgrid also included an ongoing operating expenditure out to 2074 in its NPV equation. Given the fast-changing nature of ICT, we consider this assumption to be unrealistic and therefore removed this cost.[49]

Recurrent OT cyber security capex

We acknowledge Ausgrid's efforts to reduce its forecast by $7.7 million by addressing some affordability concerns with a rephasing of an OT communications system (PDH Mux) upgrade. We also accept Ausgrid's forecast based on new information it provided in response to our draft decision.

Ausgrid provided further information to demonstrate that historical recurrent costs for OT over the current period are higher than what we assessed such that its revised forecast for recurrent OT cyber security of $31.7 million is reasonable.

In our draft decision, we considered Ausgrid did not demonstrate the need for the program based on compliance with regulatory obligations. We considered a comparison of the forecast with historical costs was an appropriate assessment as we found that for some projects replacement was a potential alternative driver, rather than being primarily driven by compliance with cyber security obligations.[50] In our draft decision, we therefore included $12.5 million for recurrent OT cyber security capex in line with historical expenditure.

In its revised proposal, Ausgrid submitted that one-off major projects occurred over the current period that meant that some typical recurrent OT replacement expenditure did not go ahead. Therefore, the historical trend of OT capex spending in the current period does not

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45 AEMO, *AESCSF Framework Overview – 2022 Program*, p. 3.

46 Ausgrid, *Attachment 5.9.3 – Cyber security CBA model – 30 Nov 2023 – Public*, Benefit Calcs workbook

47 Ausgrid, *Attachment 5.9.3 – Cyber security CBA model - 30 Nov 2023 - Public*, Benefit Calcs Tab

48 Ausgrid, *Attachment 5.9.3 – Cyber security CBA model - 30 Nov 2023 – Public*, Calcs Tab

49 Ausgrid, *Attachment 5.9.2 – Cyber security program – 30 Nov 2023 – Public*, p. 29.

50 AER, *Draft Decision Attachment 5 – Capital Expenditure – Ausgrid – 2024–29 Distribution revenue proposal – September 2023*, p. 23.

truly capture recurring OT costs. The two examples given are the Sydney Control Room Relocation and the ADMS Phase 1.[51] Ausgrid submitted that these 2 programs would have amounted in total to an additional $16.7 million to current period recurrent OT spending, bringing the total recurrent OT spending in the current period to $28.2 million. We consider this historical amount to be sufficiently close to Ausgrid's forecast and therefore accept this additional information is sufficient justification for the prudency and efficiency of Ausgrid's revised forecast.

We have also re-categorised OT cyber security capex as recurrent OT expenditure based on the information provided by Ausgrid.

Cyber security opex step change

We accept Ausgrid's proposed opex step change of $18.1 million. This is because Ausgrid has satisfactorily responded to our draft decision, including addressing concerns we raised in relation to its benefit analysis, and has reduced its proposed cyber security step change costs from our draft decision. In particular, we note that:

- its lower forecast reflects AER feedback on its initial proposal, where it has embedded productivity improvements and reprioritised its cyber security program;
- Ausgrid provided an updated cost-benefit analysis that demonstrated its proposed cyber security investment approach had the highest positive NPV of the options considered; and
- Ausgrid plans to achieve its proposed cyber security uplift with lower opex step change costs than we previously assessed were likely to be required for the 2024–29 period.

A.3 Resilience

A.3.1 AER's final decision

We do not accept Ausgrid's climate resilience total expenditure forecast of $119.6 million ($113.7 million in capex, $5.9 million in opex) would form part of a total expenditure forecast that reasonably reflects the capex and opex criteria. We have included $41.3 million ($38.1 million in capex, $3.2 million in opex) for climate resilience in our alternative estimate of total expenditure, which is $78.3 million lower than Ausgrid's proposal. Our alternative estimate comprises $3.4 million totex for community resilience, accepting Ausgrid's forecast for that component of its climate resilience program.

A.3.2 Ausgrid's proposal

Ausgrid proposed a totex forecast of $119.6 million. Table A.4 provides a breakdown of the 5 components of Ausgrid's climate resilience proposal. This forecast is 32% lower than Ausgrid's initial proposal.

[51] Ausgrid, *Attachment 5.8.2 – Operational Technology core refresh and security programs – 30 Nov 2023 – Public*, p.4-7.

Table A.4 Ausgrid's 2024-29 climate resilience revised proposal ($2024 real, million)

Component of program	Capex	Opex	Total
Network Solutions	90	0.4	90.4
Build Back Better	6.6	0.2	6.8
Heat Resilience	6	1.8	7.8
Community Resilience	0.2	3.2	3.4
Response Effectiveness	10.9	0.4	11.3
Total	**113.7**	**5.9**	**119.6**

Source: Ausgrid, *Attachment 5.5: Climate Resilience Business Case*, 30 November 2023.

In response to our draft decision, we appreciate that Ausgrid made a number of changes to its forecasting. In particular, Ausgrid:

- developed a bottom-up model to identify optimal investment in the High Voltage (HV) network;
- applied 100% weighing of RCP4.5 in line with the other DNSPs' climate models. In its initial proposal, Ausgrid applied a weighting of RCP4.5 (70%), RCP8.5 (15%) and RCP2.6 (15%); and
- modified the AER's top-down model[52] to test for the maximum capex envelope of investment to mitigate the risk.

Each component of Ausgrid's climate resilience proposal is summarised below.

Network Solutions - $90.4 million totex

Table A.5 provides a breakdown of the investments in the Network Solutions component of Ausgrid's climate resilience proposal.

Table A.5 Components of Ausgrid's Network Solutions proposal

Components of Network Solutions	Expenditure
HV Network	
Central Coast	38.2
Lake Macquarie	13.2
Port Stephens	16
Rest of network	15.8
Total HV Network	83.2

[52] This is a standalone non-standard model constructed for the purpose of Ausgrid's 2024-29 decision only as a top-down check.

LV Network	6.1
Continuous Development	0.8(capex), 0.4 (opex)
Total Network Solutions	**90.4**

Source: Ausgrid, *Attachment 5.5: Climate Resilience Business Case*, 30 November 2023.

HV network

Ausgrid uses a bottom-up model to derive its HV network forecast and then refines the AER's top-down model to confirm its bottom-up forecast.

Its bottom-up model includes the outcomes from global climate models based on a RCP of 4.5 with 100% weighing. The bottom-up model simulates conductor and pole failures and calculates the number and location of investments to address wind peril at the feeder level across the network.

Ausgrid forecasts investments using its bottom-up model over 4 regulatory periods to 2050 for a total investment of $302 million, proposing $83.2 million in 2024-29 period and primarily targeting three Local Government Areas (LGAs).[53] The three LGAs are the Central Coast, Lake Macquarie and Port Stephens.

Ausgrid confirms the forecast from its bottom-up model against an adjusted and refined version of the AER's top-down model. Its top-down model derives a total capex estimate of $354.2 million or $88 million per regulatory period (which is close to its bottom-up forecast of $83.2 million). Ausgrid's top-down model takes the historical annual average outage cost from climate related events, then grows the risk at 1% per year to 2050 to give the maximum total Value of Unserved Energy (VoUSE) that could be avoided from its proposed investments. An annual benefit multiplier is then applied to derive the total capex estimate of $354.2 million.[54]

Low Voltage (LV) network

Ausgrid forecasts $6.1 million using a model to identify optimal LV network investments in spreader bars. Ausgrid proposes to target installation of LV spreader bars across 23750 spans of LV overhead lines increasing the penetration of spreader bars in its network from 20% to 30%.

Ausgrid submits that the need for the investment is to make the network safe during a major disruptive event (conductor clashing) as well as managing resource fatigue. It states that its $6.1 million LV investment '…provides best safety benefit in avoided community exposure and Ausgrid fatigue benefit in event response.'[55]

Continuous development

53 Ausgrid, *Attachment 5.5 – Climate Resilience business case*, 30 November 2024, p.35.

54 Ausgrid, *Attachment 5.5: Climate Resilience Business Case*, 30 November 2023, p.32.

55 Ausgrid, *Attachment 5.5: Climate Resilience Business Case*, 30 November 2023, p.43.

Ausgrid submits that $1.2 million of totex investment is for performance monitoring and independent reviews of its climate resilience program, as well as updating of its climate risk modelling.

Build Back Better - $6.8 million totex

Our draft decision accepted $6 million capex for this program which involves the opportunistic replacement of timber poles with composite poles in bushfire risk areas. Ausgrid submits an additional $0.8 million totex is required to uplift standard and work processes to establish Build Back Better practices.

Heat Resilience - $7.8 million totex

Ausgrid's heat resilience program is a new addition to its proposal. It was included in response to stakeholder concerns expressed at the AER Predetermination Conferences and directly with Ausgrid in October 2023.[56] Ausgrid also engaged with a number of other stakeholders including the VoCP.

The program involves:[57]

- developing the knowledge base on the impact of heat on Ausgrid's assets and update standards ($1.5 million opex); and
- establishing evidence to quantify aerial bundled cabling (ABC) network benefits and Ausgrid's role and enable growth in urban canopy by co-funding the rollout of ABC with councils up to a maximum of $6.3 million ($6 million capex, $0.3 million opex).

Ausgrid's proposed investment is based on its discussions with councils that $6 million is what councils would be willing to co-contribute for this program.

Community Resilience - $3.4 million totex

Ausgrid submits that its community resilience program was designed through a deliberative engagement process, working with customers to progressively consider costs and benefits and prioritisation. This project involves:[58]

- $0.2 million in capex on 20-30 small mobile generators and minor upgrades of existing community hubs; and
- $3.2 million in opex on resilience communications, coordination and planning, and performance monitoring.

Ausgrid notes that this package is strongly supported by customers in priority LGAs and across the network and balances affordability.[59]

Response Effectiveness - $11.3 million totex

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56 Ausgrid, *Attachment 5.5: Climate Resilience Business Case*, 30 November 2023, p.53.

57 Ausgrid, *Attachment 5.5: Climate Resilience Business Case*, 30 November 2023, p.53-60.

58 Ausgrid, *Attachment 5.5: Climate Resilience Business Case*, 30 November 2023, p.68.

59 Ausgrid, *Attachment 5.5: Climate Resilience Business Case*, 30 November 2023, p.67.

In our draft decision, we accepted $3 million for Ausgrid's proposal to extend its existing multi-agency liaison processes and resources. Ausgrid's revised proposal includes additional expenditure:[60]

- to share more data between Ausgrid and other emergency service agencies ($3.5 million in capex and $0.4 million in opex); and
- invest in fault detection and location sensors with $7.4 million in capex and $0.15 million opex for performance monitoring and review. The capex investment relates to the installation of 1200 fault detection and location sensors on its HV network to enable feeder reclose to be performed before patrolling remote or difficult to access feeders. [61]

A.3.3 Reasons for decision

We acknowledge the continual need for investments by networks to better manage extreme weather events and the projected increase in climate related risk.

We are also cognisant of Ausgrid's efforts to better understand the impact of climate effects on its network. Ausgrid has invested in a number of models and engaged extensively with its customers about their preferences. We also note the constructive engagement Ausgrid has had with us after the draft decision, where we have provided early feedback on its modelling and had open dialogue about its forecasting approach.

More generally, we are aware that the electricity industry's understanding of the impact of climate change on electricity networks is still at a learning stage. Our assessment of proposals takes account of the limitations and challenges in forecasting climate related expenditure. At the same time, in such an uncertain environment where resilience is a new and challenging topic, we consider it important to be clear about the type of evidence expected to support resilience-related proposals. This will ensure that that investments are in the long-term interests of consumers including the efficient allocation of risk from extreme weather events.

To assist in understanding resilience-related investments, we propose performance reporting of NSP's resilience investments going forward. This information will also be relevant for updates to the AER's network resilience guidance note. We note that a number of submissions requested updates and further clarification on aspects of the AER's network resilience guidance note. We also consider that this performance reporting has interrelations with our proposed performance reporting for innovation, especially as we are seeing innovation proposals being related to resilience.

Below we set out our assessment against our resilience guidance note, and our findings on each of the components of Ausgrid's climate resilience proposal.

Assessment against our resilience guidance note

In assessing the prudency and efficiency of Ausgrid's climate resilience program, we have had regard to the extent that its proposal satisfies relevant criteria in our guidance note on network resilience. In that note, we set out our expectations of the type of evidence

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60 Ausgrid, *Attachment 5.5: Climate Resilience Business Case*, 30 November 2023, p.72-81.

61 Ausgrid, *Attachment 5.5: Climate Resilience Business Case*, 30 November 2023, p.81.

businesses should provide to demonstrate that their resilience-related proposals are prudent and efficient; these being:

- *Identified need*; that there is a causal relationship between the proposed resilience expenditure and the expected increase in the extreme weather event;
- *Testing of the preferred option*; that the proposed expenditure is required to maintain service levels and is based on the option that likely achieves the greatest net benefit of the feasible options considered; and
- *Genuine consumer engagement*; that consumers have been fully informed of different resilience expenditure options, including the implications stemming from these options, and that they are supportive of the proposed expenditure.

Overall, we consider that Ausgrid has undertaken extensive customer engagement especially at the local community level and with the wider community to determine their support for localised resilience outcomes. In this regard, we consider Ausgrid has satisfied the criteria of genuine consumer engagement.

We do not consider Ausgrid has satisfied the other two criteria in our guidance note; in particular, demonstrating a causal link between the impact on the Ausgrid's network and the expected increase in climate risk, and that the preferred investment is likely to have the greatest net benefit to consumers. In this regard, while we had no concern with Ausgrid's climate projection modelling approach, based on the information before us, we do not have confidence that the proposed investment from its network impact models (both its bottom-up and top-down model) is likely to result in a prudent and efficient outcome.

Identified need

We consider that Ausgrid has not addressed this criterion.

We do not consider that Ausgrid's bottom-up and top-down forecasting approach demonstrates a casual linkage between the network impact from a projected expected increase in climate risk.

For Ausgrid's Network Solutions program, the largest component of its proposal representing more than 75% of its proposal, we agree with Ausgrid that there is a need for resilience investment. But we found that Ausgrid did not provide sufficient evidence to support its premise that its network will be materially impacted from windstorms to justify a totex investment of $90.4 million.

In particular, we had a number of concerns with the underlying assumptions in Ausgrid's bottom-up and top-down models. We found an overstatement of the benefits of its specific locational investment and a lack of evidence around some of its key assumptions. This meant that we did not have confidence that the proposed investment to address the network impact from the expected increase in climate risk is prudent and efficient.

We have no concerns with the climate projection model. We appreciate that there are uncertainties when projecting climate and consider that such modelling is new and evolving.

Testing of the preferred option

We consider Ausgrid has not satisfied this criterion.

We found a number of examples where Ausgrid's preferred option was unlikely to result in the greatest net benefit. For its Network Solutions forecast, Ausgrid's bottom-up model did not appear to select optimal investments and found a significant number of investments with a negative cost benefit. Further, its top-down model included benefits from avoided outages where no investment is proposed, overstating the benefits from the proposed locational specific investment.

For other parts of Ausgrid's climate resilience proposal such as its Heat Resilience Program and Response Effectiveness Program, while Ausgrid provided qualitative statements about the benefits of these programs, we found a lack of quantitative evidence to support the prudency and efficiency of Ausgrid's proposed investment.

Genuine consumer engagement

We consider that Ausgrid has satisfied this criterion.

Overall, we consider that Ausgrid has undertaken an extensive and ambitious customer engagement process in a new area of expenditure. We are also cognisant that has invested in different ways to engage with its stakeholders. We especially note Ausgrid's efforts to work with local communities to better understand their preferences. In this regard, we have accepted Ausgrid's forecast for its community resilience program.

Most submissions received noted Ausgrid's genuine desire to better understand its consumers preferences in this uncertain area of expenditure. As noted by PIAC, Ausgrid's engagement program for its resilience proposal is "…the most ambitious and in-depth effort to develop bespoke approaches to community and network resilience in NSW".[62]

There were also mixed views as to whether its proposal truly reflects its customers' preferences. The RCP confirms that customers continue to give strong support to Ausgrid beginning to invest from 2024-29 to maintain network performance by 2050 and to provide greater support for customers during extreme weather events.[63] In contrast, CCP26 questions whether Ausgrid's proposal truly reflects the preferences of its customers given concerns with the way Ausgrid engaged with its customers. This is a concern shared by PIAC. For instance, PIAC notes that it continues to be concerned that the local community workshops remained overly focused on supporting the local community to carry out, what was in effect, a cost-benefit analysis of technical interventions, that were not always immediately comparable or comprehensible to all participants. It also considers that discussions on affordability were lacking.[64]

Findings on Ausgrid's HV forecast

We agree with Ausgrid's view that the top-down model is a tool to conduct a high-level sense check. We have reviewed Ausgrid's top-down and bottom-up models, using the top-down model as a high-level sense check of our review of Ausgrid's bottom-up model.

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62 PIAC, *Draft Decision 2024–29 revenue determination: Ausgrid, Endeavour and Essential Energy*, 19 February 2024, p. 8.

63 RCP, *RCP Report on Ausgrid Revised Proposal*, 29 November 2023, p. 22.

64 PIAC, *Draft Decision 2024–29 revenue determination: Ausgrid, Endeavour and Essential Energy*, 19 February 2024, p. 10.

Bottom-up forecast

We found Ausgrid's bottom-up model to be transparent well-documented, and the logics and mechanics of the model to be clear. We commend Ausgrid for the considerable efforts it has taken to develop a new bottom-up model which is an improvement from its initial model.

However, we found a number of concerns with Ausgrid's model. These concerns meant that we do not have confidence that the model outcomes reflect prudent and efficient investments and therefore in the long-term interest of consumers.

We assessed Ausgrid's forecast investments which are at the feeder level against the historical outages associated with each feeder for the past 11 years (2012 to 2022). Our expectation is that a prudent operator would prioritise investment based on high failure rates in combination of the amount of total value of unserved energy (VoUSE), and only invest when there is confidence that the Benefit to Cost Ratio (BCR) is net positive at a feeder level. Where this is not the case, we would expect supporting evidence to explain the reasoning for the shift away from historical outcomes.

We found several incidences where the proposed investments have materially departed from its failure history. For example:

- $2.5 million on a feeder (ZN00265/081641) with no history of failure and thus no VoUSE in the past 11 years;
- $1.6 million on a feeder (ZN00229/034989) with a single failure and a total VoUSE of $54000 in the past 11 years;
- $8.3 million on a feeder (ZN12620/000002) with two failures but a total VoUSE of $27000 in the past 11 years.

We also found that only one third of its proposed investments had a BCR above 1 once we grow the VoUSE in accordance with climate model projections. We note that Ausgrid considers that a BCR threshold of 1.2 is reasonable as set out in its initial proposal and expects its proposed investment in its revised proposal to have an average BCR of 3.14.[65] [66]

Given these concerns, we made adjustments to Ausgrid's bottom-up model to derive our alternative forecast:

- Including investments in feeders in the three LGAs and proportion of the rest of the network where the BCR is above 1. This results in a capex forecast of $35.9 million; and
- Excluding investments already included in Ausgrid's total capex forecast. In our draft decision, we accepted Ausgrid's proposed reliability programs.[67] We found that some expenditure in its reliability program was already included in its climate resilience program because both programs target similar worst performing feeders. We have therefore removed $6.7 million to address this capex double count.

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65 Ausgrid, *Climate Resilience Business Case*, 14 January 2023, p.28.

66 Ausgrid, *Attachment 5.5: Climate Resilience Business Case*, 30 November 2023, p.39.

67 These programs are individual feeder reliability, individual feeder segment reliability and high community impact assets reliability programs.

These adjustments resulted in an alternative forecast of $29.1 million.

Further engagement with Ausgrid about our concerns with its bottom-up model

We provided our adjusted bottom-up model to Ausgrid on 13 February to give it an opportunity to address our concerns. In response, we received new bottom-up models from Ausgrid on 26 February.

Ausgrid noted these new models better aligns with historical outages and changed its preferred investments in feeders. It submits that since the original model (that forecasts investments based on feeder attributes) and these new revised models (based on historical outages) derive an equivalent total capex outcome (approximately $80 million for the regulatory period), it provides a level of assurance that its proposed capex is prudent and efficient. We have reviewed the new models and note the following concerns:

- Our main concern is that while the new models produce a similar capex forecast compared to the existing bottom-up model, the set of feeder investments derived by each model are materially different. A comparison of the results at the feeder level shows that only 38% of the feeder investments are common across the models for the 2024-29 period. This indicates that the benefits associated with the remaining 62% of feeder investments are uncertain. The commonality of the results is reduced even further to 26% over the longer term. Ausgrid also did not provide information to support whether one model is better than the other models. The material lack of commonality of the feeder investments in the Ausgrid's original and new models does not provide us with confidence that its investment is prudent and efficient as what it targets varies depending on the model; and
- We encountered anomalies when we compared the model results. For example, the existing bottom-up model for the three LGAs comprised of 95 feeder investments in the 2024-29 period at a total cost of $65 million. The new model for the same three LGAs comprised of 77 feeder investments next period but with the same total cost of $65 million. We could expect the total cost to reduce when the number of feeder investments are reduced by 19%.

Overall, we are concerned that Ausgrid's proposal appears to be based on an overall capex envelope of approximately $80 million. We contrast this with our adjustments to Ausgrid's model where we align its proposed investments at the feeder level with historical outages associated with each feeder as well as allowing for growth in climate risk in accordance with the climate model projections. Our approach ensures that each targeted investment has an overall positive outcome to consumers.

We also note that Ausgrid's response reaffirms our alternative forecast given that 38% of feeder investments are common across Ausgrid's original and new model, which is close to our forecast (one third of Ausgrid's proposed investments).

Top-down forecast

We are encouraged by Ausgrid's application of the AER's top-down model.

However, we have a number of concerns with its refinements to the top-down model that has meant we do not have confidence that the model outcomes reflect prudent and efficient investments.

Our key concern is that Ausgrid's top-down model materially overstates the benefits from its targeted investment; in particular:

- Ausgrid's assumption there is a 100% probability of a wind event occurring in the same location (the return frequency) every year is overstated.

  As Ausgrid is proposing targeted investments at a feeder level, it is appropriate to apply locational specific return frequency. While the network as a whole may see a yearly recurrence of a major storm, the benefits from investment at a specific location can only be realised at the frequency at which a major storm occurs at the specific investment location itself.

  Our draft decision applied 50% (that is, there is a 50% probability of the extreme wind event occurring in the same location) based on the information before us then. Based on Ausgrid's new outage data, at any specific investment location the median return frequency of a major storm event causing significant outages is approximately once every 4.5 years or 22% probability.

- Ausgrid has included benefits from avoided outages where no investment is proposed (other LGAs beyond those of Central Coast, Lack Macquarie and Port Stephens and a proportion for all other LGAs). It also included outages associated with asset types that would not be avoided by the proposed network investments. For example, the installation of CCT will not avoid outages associated with assets such as '3rd Party Assets'.

Given these concerns, we made the following adjustments to Ausgrid's top-down model to derive our alternative forecast:

- We applied a return frequency of 33% per annum. While our analysis of Ausgrid's new data set reveals that the return frequency is approximately 22%, we have applied a higher return frequency - a midpoint between 50% and 22% - to acknowledge that a sensitivity margin is reasonable especially given that a longer outage time-series would be more appropriate to calculate return frequency.
- We reduced the maximum benefit by excluding the obvious outages that cannot be avoided by Ausgrid's proposed investments; that is, those investments outside of the targeted LGAs; and
- We refined our approach to more accurately reflect the time value of money. In our draft decision, we applied an annual benefit multiplier to approximate capex over the time-series by using a 15 times annual benefit as an approximation of the annual benefit to the break-even total capex invested. Our time series approach is the standardised method to account for the annual capital costs and investment benefits in net present terms which is appropriate especially for a long time series.

When we make these adjustments, we derive a forecast of $27 million. We note that this is lower than our alternative bottom-up forecast of $29.1 million.

We found other concerns with Ausgrid's top-down model that could potentially reduce our alternative forecast even lower. For instance, Ausgrid assumes that CCT is 75% effective for wind peril. This value is not sufficiently supported and we expect the value would be considerably lower. This is not accounted for in Ausgrid's proposal.

While we had these concerns, we did not make further adjustments given the uncertainty around possible alternative assumptions/values in this area of expenditure. However, we intend to explore these areas in more detail in future processes.

Further engagement with Ausgrid about our concerns with its top-down model

We provided our findings and position as well as our adjusted top-down model to Ausgrid to give it an opportunity to explain these findings.

Ausgrid submits that its approach is to reduce risk below baseline levels in some areas where it is targeting investment but then to accept risk growth in other areas such that net effect is risk is kept at a steady level. Ausgrid explains its approach in the following way:[68]

- We consider it's in customers' interests (particularly in relation to price outcomes) to target climate risk across the network as a whole.
- As a consequence, we focus on investments with the greatest value to manage climate risk (e.g. on the Central Coast) recognising that in some areas there is less value to investing (e.g. in Sydney's Inner West).
- This means we will reduce risk below the baseline level in those areas where we target investments, but accept risk growth in areas that we don't, with the net impact keeping aggregate risk steady.
- Therefore, it is important that the benefits of reducing risk below the baseline level in those targeted areas is considered when assessing our proposal.

  Conclusion: Excluding the buy down in 'baseline' risk in priority LGAs would mean that aggregate climate risk would grow across our whole network and Ausgrid would not have a total capex allowance needed to maintain service levels.

Ausgrid also provided additional information in response to our concerns about the lack of STPIS adjustment. This information showed that there is a STPIS gain of $38,000 per annum with a sensitivity of between $0.7 million per annum loss to $1.4 million per annum gain.

We make the following observations about Ausgrid's additional supporting material:

- Ausgrid's model has been updated to include additional outage events (i.e. 3rd party assets) but these do not make a material difference between the results from the AER's top-down model and Ausgrid's new top-down model.
- Our view is that the capex objective requiring the maintenance of reliability is not a requirement to be achieved at any cost. The investment required to maintain reliability must also be efficient. Based on our analysis, Ausgrid's approach of reducing risk below the network average baseline level in specific locations requires investments that are not efficient.
- To test the efficiency of the proposed investments, it is necessary to associate the available benefits with the specific investments proposed, and benefits associated with the balance of the network (i.e. whole of network) with whole of network investment – that is, the benefits should be associated with the costs that achieve those benefits to determine efficiency. Ausgrid appears to indicate that to maintain reliability across the network, it is necessary to allocate benefits to the proposed investment that are not

[68] Email to AER, *AER/Ausgrid – Discussion on climate resilience*, 1 February 2024.

actually attainable by the proposed investment. We consider this is an incorrect application of cost benefit analysis.

- We agree with Ausgrid's point that the top-down model will underestimate the benefits as it does not account for the additional benefits that are attainable by targeting multiple solutions to the worst performing feeders. However, these additional benefits would not account for the material gap, that is, a difference of $56 million ($83 million vs $27 million) needed to "close the gap" between the Ausgrid model and the AER model.

Findings on Ausgrid's LV forecast

We found Ausgrid's material in support of its LV forecast did not support a prudent and efficient investment. In particular, we found:

- the need for the investment in Ausgrid's modelled cost benefit analysis did not align with the need in its business case. In particular, we found the benefit in its cost benefit analysis was entirely based on the value of unserved energy (and not safety and fatigue benefits as set out in its business case);
- only a qualitative statement about the safety and fatigue benefits with no quantitative evidence of these benefits;
- overstated total benefits from this investment where all the benefit of avoiding LV outages from climate events has been included even though these may not have been caused by conductor clashing;
- no evidence to support its assumption that low voltage spreader bars are 90% effective against wind and 50% effective against vegetation; and
- with a BCR of 1.3, this program did not pass reasonable sensitivity tests when lower effectiveness assumptions are used (i.e. 70% on wind and 35% on vegetation).

Given these concerns, we have not included expenditure for Ausgrid's LV program in our total capex forecast.

Findings on overall expenditure on performance monitoring and reviews

Ausgrid proposes a total of $4.6 million of expenditure for performance monitoring, research and reviews of its climate resilience program. These are across 4 of the programs within its climate resilience proposal as follows:

- $1.1 million totex in its Network Solutions program;
- $0.8 million totex in its Build Back Better program;
- $1.8 million opex in its Heat Resilience program; and
- $0.9 million totex in its Response Effectiveness program.

Given the uncertainties in this new area of expenditure, we recognise the importance of continuously reviewing, updating and assessing the performance of its proposed and new resilience initiatives.

However, we consider such activities as portfolio planning, program review and performance monitoring to be inherently business-as-usual in nature, and to be part of prudent existing asset management and business practices. We also note that Ausgrid's proposed expenditure is not a direct cost because the costs are not directly related to the design and construction of physical assets. We typically categorise these types of costs as indirect costs

or overheads. We consider that Ausgrid is already funded for this expenditure in its capitalised overheads and base opex, which we have accepted under our standard forecasting approaches. We have therefore not included Ausgrid's proposed $4.6 million forecast for planning, performance monitoring and reviews in its total capex and opex forecasts.

Findings on Heat Resilience

We received a number of submissions in support for this program.

We acknowledge support from some stakeholders for this program, from Committee for Sydney,[69] North Sydney Council,[70] Western Sydney University,[71] and Resilient Sydney[72]. For instance, Resilient Sydney submits that heat is a significant contributor to network outages and converting cabling to aerial bundling cabling (ABC) would support network resilience outcomes with vegetation cover reducing local land surface temperatures.[73]

We also note the CCP26 submission that the Heat Resilience program was a late inclusion into Ausgrid's proposal which has impacted the quality of engagement and left some issues unresolved. It observes that while the Heat Resilience project received support from the VoC panel, and the RCP expressed support for a more modest program, there appears to be a range of considerations that still need to worked through.[74]

While we had regard to the community interest in this program, we found Ausgrid did not provide sufficient evidence to support the prudency and efficiency of its Heat Resilience program. We therefore have not included a forecast for Ausgrid's Heat Resilience program in our total capex forecast.

In coming to our position, we note Ausgrid's own acknowledgement that the quantifiable benefits of ABC have not been established as Ausgrid proposes to gather evidence to quantify ABC network benefits. It also did not provide evidence that its proposed network solution is the most efficient solution or is the only solution that can enable councils to provide urban cooling.

We also have not been presented with sufficient evidence to demonstrate that the quantifiable benefits of ABC can be considered as a network service. While there is a safety element associated with urban cooling, at this stage, we do not consider the need for NSPs to provide urban cooling as a network benefit.

Findings on Community Resilience

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69 Committee for Sydney, *Ausgrid Climate Resilience Revised Business Case*, 11 January 2024.

70 North Sydney Council, *Letter to Support to the Aerial-Bundled-Cable Program of Ausgrid*, 20 December 2023.

71 Western Sydney University, *Submission on Ausgrid's 2024–2029 Regulatory Proposal – Climate Resilience Business Case*, 3 January 2024.

72 Resilient Sydney, *Submission*, 15 January 2024.

73 Resilient Sydney, *Submission*, 15 January 2024, p.1.

74 The CCP26, *Submission to the Australian Energy Regulator's Draft Decision and Ausgrid's Revised Regulatory Proposal*, January 2024, p. 4.

We have included Ausgrid's proposed totex of $3.4 million ($2023–24) for community resilience in our estimates of total forecast opex ($3.2 million) and capex ($0.2 million).

In forming our decision, we further reviewed the supporting information provided by Ausgrid on its community resilience proposal, including Ausgrid's updated resilience business case and additional information provided in Ausgrid's revised proposal. We recognise that Ausgrid engaged with the feedback we provided through our draft decision to refine its analysis and continue its consumer engagement with both its customers and broader resilience actors. Our final decision has regard for and places weight on the strong community support Ausgrid has achieved throughout its extensive consumer engagement program.

For the final decision, we have included Ausgrid's proposed community resilience expenditure in our estimates of total forecast opex and capex. In response to our draft decision, Ausgrid found efficiencies and identified opportunities to streamline and absorb components of this work. For example, Ausgrid accommodated the community resilience plan and some uplift in safety and outage messaging, and reduced the costs of the data sharing liaison role by streamlining activities into a single program of work.[75]

We are satisfied that some additional costs are required to enable Ausgrid to realise the customer benefits of the resilience program, and that the revised community resilience proposal is likely to reasonably reflect prudent and efficient costs. The proposed community resilience program expenditure responds to customer preferences, and will result in tangible outcomes to increase community resilience.

Findings on Response Effectiveness

We found Ausgrid's revised proposal for additional expenditure for its Response Effectiveness program to be inconsistent with prudent and efficient decision-making. Our draft decision included $3 million for data sharing. We have included our draft decision forecast in our total capex forecast.

We found that Ausgrid's cost-benefit analysis is based on the reduction of patrol time on a feeder with a length of 12km at a patrol speed of 10km per hour. However, the majority of Ausgrid's HV feeders - 66% (or 1274 HV feeders) of Ausgrid's total 1,931 HV feeders - are less than 2km in overhead length and 92% (or 1,776 HV feeders) are less than 12km in overhead length, with the remainder 8% (or 155 HV feeders) over 12km in overhead length. We also understand Ausgrid has standard fault detection and location sensors on some of its feeders, as opposed to the "smart" sensors it is proposing to install. It was therefore unclear how Ausgrid had derived its forecast of 1,200 units of fault detection and location sensors.

We requested further information from Ausgrid about which feeders it is proposing to install these smart 1200 sensors, the key difference in functionality and costs between smart versus existing sensors and the number and location of existing sensors on the network.[76]

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75 Ausgrid, *Revised proposal – Attachment 6.1 – Proposed operating expenditure*, pp. 30-31.

76 AER, Information request 061 – Resilience, 20 December 2023, p. 3

Ausgrid's response did not provide us sufficient justification that its investment is prudent and efficient.[77] In particular, we found that:

- Ausgrid had revised its proposed volume from 1,200 to 674 units but also materially increased its unit cost, from $6,000 to $11,000 per unit to maintain the equivalent proposed capex. It did not provide sufficient evidence to support the material step up in cost;
- Little information was provided to support the benefit of using a smart sensor which is 4 times higher in cost than a standard sensor (i.e. $3,000 versus $11,000); and
- There is uncertainty around the operability of the 674 units forecast to be installed given that these are currently untested, with 30 being trialled this year under its network innovation program.

A.4 CER integration

A.4.1 AER's final decision

We do not accept Ausgrid's CER integration capex forecast of $45.3 million would form part of a total capex forecast that reasonably reflects the capex criteria. We have included $29.1 million for CER in our alternative capex estimate which is $16.2 million lower than Ausgrid's proposal. Our alternative estimate accepts Ausgrid's forecasts to integrate rooftop solar and for dynamic service capabilities but includes a lower expenditure forecast to integrate electric vehicles (EVs).

We accept Ausgrid's opex step change of $3.9 million for dynamic service capabilities. This is set out in the opex attachment (attachment 6).

A.4.2 Ausgrid's proposal

Ausgrid's CER integration capex forecast includes $37.2 million for network augmentation. The network augmentation forecast includes $4.7 million to support rooftop solar integration and $32.5 million for electric vehicle (EV) integration. Ausgrid provided a business case and cost-benefit analysis models to support its expenditure proposal. It also provided reports from Evenergi and Deloitte Access Economics to support its forecasts of EV uptake and behaviour.

The proposed rooftop solar integration investments include tap changes, phase re-balancing and distributor and substation upgrades. These investments will address overvoltage and allow a greater level of exports from rooftop solar. Ausgrid's model quantifies wholesale market benefits (using the AER's customer export curtailment values) and emissions reduction benefits to justify the proposed expenditure.

The proposed EV integration investments include a mixture of LV distributor and distribution substation upgrades. These investments will address the risk of EV charging overloading feeders and leading to network outages. Ausgrid's model quantifies avoided unserved energy to justify the proposed expenditure.

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[77] Ausgrid, Response to information request 061 – Resilience, 22 January 2024, pp. 13-17.

Ausgrid also proposed $8.1 million of capex and an opex step change of $3.9 million for investments in dynamic service capabilities. These investments will enable dynamic pricing, dynamic operating envelopes and associated supporting systems. Ausgrid provided a business case and a report from HoustonKemp to support its expenditure proposal.

A.4.3 Reasons for decision

Rooftop solar integration

In our draft determination, we were critical of Ausgrid's approach to measuring the occurrence of export curtailment (by adopting a 253V trigger for curtailment) and valuing avoided export curtailment (by using annualised rather than time-specific customer export curtailment values). In its revised proposal, Ausgrid responded to our feedback and made the following modelling adjustments:

- It forecast instances of curtailment as per the requirements of the inverter standard AS 4777.2:2020 for the management of overvoltage, and
- It adopted weighted customer export curtailment values based on time of day and removed its interpolation between 5-year periods.

We are satisfied that these modelling adjustments lead to a more accurate forecast of the volume and value of export curtailment.

Ausgrid also valued emissions reduction benefits at $30 per tonne of CO2 emitted. Consistent with the guidance we published in September 2023, we intend to apply the amended national energy objectives to Ausgrid's 2024–29 revenue determination, and therefore consider that emissions reduction benefits can be quantified to (partly) justify this proposed investment. We note that the interim value of emissions reduction is greater than $30 per tonne of CO2 emitted, and therefore recognise that the benefits associated with Ausgrid's proposed investments are likely to be more material than claimed.[78]

Our alternative capex estimate includes $4.7 million for rooftop solar integration.

EV integration

Ausgrid submitted that it must address capacity-related constraints due to the impact of EV charging on its LV network. It submitted that the number of EVs registered in its network area will increase from 10,000 in 2022 to 430,000 in 2029. Ausgrid's proposed investments will prevent EV charging leading to network outages. These investments are separate from Ausgrid's existing HV and LV augmentation program, for which we approved $81.2 million of capex in our draft determination.

Ausgrid provided a detailed cost-benefit analysis model which identifies feeder-level investments based on existing asset utilisation, the forecast uptake of EVs for each feeder, the impact of EV charging on asset utilisation and the type of investment required to accommodate demand for EV charging. Ausgrid did not provide this model in its initial proposal, but it did provide a summary of model inputs and outputs in response to our

[78] AER, *Valuing emissions reduction draft guidance*, March 2024.

information request. The following key modelling assumptions impact Ausgrid's forecast of expenditure to address constraints due to EV charging:

- *The contribution of EV charging to peak demand.* AEMO publishes this forecast as part of its Integrated System Plan, based on reports developed by the CSIRO. In AEMO's 2023 Inputs, Assumptions and Scenarios Report, the CSIRO forecast that EV owners are more likely to charge their vehicles using standard power sockets rather than dedicated EV chargers. This has the effect of reducing peak demand per vehicle (after diversity) to around 0.4 kW. In its revised proposal, Ausgrid accordingly adjusted this assumption from 1kW to 0.39 kW per vehicle. This has the effect of reducing the forecast level of unserved energy.
- *The EV capacity risk conversion rate.* Ausgrid's model notes that this is the probability of a 'justified' investment resulting in a network upgrade. Ausgrid's model considered a range of 40-60% and applied the upper range of 60%. In its revised proposal, Ausgrid adjusted this assumption from 50% to 60%. This has the effect of increasing the total number of investments and the expenditure forecast.
- *The utilisation investment threshold.* The utilisation rate is measured for each distributor using existing network data. This rate is then adjusted to account for the impact of EV charging over time. If the rate exceeds the threshold for a particular distributor after this adjustment is made, the distributor is listed as a 'justified' investment. Ausgrid's model considered a range of 95-110% and applied the lower range of 95%. In its revised proposal, Ausgrid adjusted this from a threshold of 100%. This has the effect of increasing the total number of investments and the expenditure forecast.
- *Unit rates.* Ausgrid's model includes standard unit rates for nine types of investment solutions, and then applies a scaling factor of 2 (which doubles these unit rates). Ausgrid noted that this is reflective of the higher cost of working in its urban network. In its revised proposal, Ausgrid increased its unit rate scaling factor from 1.5 to 2. This has the effect of increasing the expenditure forecast.
- *The value of customer reliability (VCR).* In its revised proposal, Ausgrid increased the VCR from $34.11 per kWh to $46.03 per kWh (a statewide estimate). This has the effect of increasing the value of forecast unserved energy and benefits of the proposed investments.

We sought further information from Ausgrid to justify its proposed augmentation program, including the rationale for its updated modelling assumptions.

To justify the greater EV capacity risk conversion rate, Ausgrid noted that EV uptake has a clustering behaviour and it is likely that overloads associated with EV demand will persist to the extent that network investment is required. We consider that key factors related to EV charging demand will impact other modelling assumptions, such as the number of EVs, the contribution of EV charging to peak demand and the impact of EV charging on asset utilisation. Therefore, we don't consider that a more conservative assumption is justified.

To justify the greater unit rate scaling factor, Ausgrid noted that its new scaling factor better reflects the cost of augmentation in underground areas. It provided regional analysis demonstrating that 30% of all augmentations will occur in its Southern network region (Sydney), 19% will occur in its Central network region and 50% will occur in its Northern

network region (including Newcastle). Ausgrid also suggested that the Newcastle CBD will require similar unit rates to Sydney due to underground augmentations. Our analysis of Ausgrid's cost-benefit analysis model found that only 12% of augmentations in the Northern region (and 6% of total augmentations) will occur in the Newcastle CBD. Therefore, if we agree that a scaling factor should apply to underground augmentations, it should only apply to 36% of the total augmentations (a scaling factor of 1.36).

To justify the lower utilisation investment threshold, Ausgrid noted that LV distributors in the HV/LV augmentation program were historically managed using a 100% or higher utilisation factor, because underlying demand growth for HV and LV capacity in its network area is typically low and sometimes negative. However, with demand for EVs increasing, it adjusted the forecast investment utilisation threshold to 95% to reflect the forecast growth rate in EVs on the network, overload risk and confidence that capacity will be utilised. We consider that, although Ausgrid's modelling adjustment is somewhat arbitrary, it may be appropriate to adjust this assumption due to the uncertainty associated with EV forecasts.

For the VCR, we requested that Ausgrid provide calculations by customer-type and postcode to justify its selected value. Ausgrid did not provide this analysis, and instead noted that EV adoption will occur in higher wealth areas and this could indicate a higher willingness to pay and therefore higher VCRs. Although we do not have the information necessary to formulate a more appropriate VCR (on a customer-weighted basis), we consider it likely that the selected VCR overstates the value of unserved energy and the benefits of the proposed investments.

Stakeholders did not comment specifically on Ausgrid's approach to forecasting augmentation expenditure driven by EV charging. The Consumer Challenge Panel (CCP26) noted that network businesses are facing risks associated with forecasting with confidence the rate of take up of consumer energy resources, including electric vehicles.[79] We recognise there is uncertainty associated with managing the network impacts of EV charging. However, we consider Ausgrid has not sufficiently justified its use of more conservative modelling assumptions. These assumptions offset the expected reduction in expenditure due to AEMO's updated assumption about the contribution of EV charging to peak demand.

To develop our alternative estimate, we adjusted unit rates to account for augmentations in non-urban areas and applied a more reasonable EV capacity conversion rate.

- For unit rates, we applied a scaling factor of 1.5. This was the scaling factor Ausgrid applied in its initial proposal and is very similar to our potential alternative of 1.36, which considers the forecast number of investments in urban areas.
- For the EV capacity conversion rate, we applied a rate of 50%. This was the rate Ausgrid applied in its initial proposal and is consistent with forecast rates applied in its LV augmentation program (for LV fuse overloads, which are expected to be the primary reason for EV driven outages).

[79] Consumer Challenge Panel, Sub-panel 26, *Submission to the Australian Energy regulator's Draft Decision and Ausgrid's Revised Regulatory Proposal*, January 2024.

Our alternative capex estimate includes $16.3 million for EV integration. This estimate is reflective of the above modelling adjustments using Ausgrid's cost-benefit analysis model.

Dynamic service capabilities

Ausgrid's proposed investments are foundational in nature and will enable it to assume a distribution system operator (DSO) role, whereby it will manage its network using dynamic network prices and dynamic operating envelopes. In our draft determination we did not accept this expenditure as we considered that Ausgrid had overvalued "market efficiency" benefits associated with these investments. We suggested that Ausgrid should use our published customer export curtailment values instead of forecasts of (differences in) wholesale electricity prices to value these benefits.

We accept Ausgrid's revised proposal as it has updated its modelling based on our feedback to demonstrate that the expenditure is prudent and efficient. The benefits of these investments are likely to be lower than previously forecast but are still sufficient to justify Ausgrid's proposed level of investment.

Our alternative capex estimate includes $8.1 million for dynamic service capabilities. We also accept Ausgrid's associated opex step change of $3.9 million.

A.5 Innovation

A.5.1 AER's final decision

We do not accept that Ausgrid's revised total expenditure forecast of $49.2 million ($44.7 million in capex, $4.5 million in opex) for network innovation would form part of a total expenditure forecast that reasonably reflects the expenditure criteria. We have included $17 million ($15.4 million in capex, $1.5 million in opex) in our alternative estimate.

A.5.2 Ausgrid's proposal

Ausgrid proposed $49.2 million totex for its Network Innovation Program (NIP). The proposed program consists of 31 individual projects, the smallest of which is $285,000 and the largest being $5.7 million. Its opex forecast is for the expected uplift in maintenance for field assets, Software as a Service subscriptions and back-end data/communication costs. It also included opex for an expansion of collaborative research & development funding with universities, industry bodies and the wider energy industry.[80]

Ausgrid proposed to self-fund 10% of the total program across both the capex and the opex ($4.9 million). It also proposed to continue to have the Network Innovation Advisory Committee (NIAC) provide oversight on its NIP in the forecast period.[81] To monitor the progress of the NIP, Ausgrid proposed to report on its innovation expenditure through the AER's regulatory information notices (RIN) or regulatory information order (RIO) process. Its CEO would also sign a declaration attesting that 10% of its actual innovation spend was funded through other means besides regulated revenue.

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80 Ausgrid – Att. 5.8.a – Network innovation program – 31 Jan 2023 – Public, p.19.

81 Ausgrid – Att. 5.8 – Network innovation program – 30 Nov 2023 – Public, p.4.

As supporting material, Ausgrid provided a program summary on each project and a cost-benefit model.

Table A.6 outlines Ausgrid's revised network innovation totex proposal and compares this with Ausgrid's initial proposal and our draft decision.

Table A.6 Ausgrid's 2024-29 Network Innovation revised proposal ($2024 real, million)

	Initial Proposal	Draft Decision	Revised Proposal
Innovation Capex	49.5	0	44.7
Innovation Opex	5.0	0	4.5
Innovation Totex	**54.5**	**0**	**49.2**

Source: AER draft decision and Ausgrid's initial and revised proposals.

We acknowledge Ausgrid's efforts in responding to the feedback in our draft decision where, amongst other things, it provided further detail about projects within its NIP, explained how it considered funding from other sources before considering an ex-ante forecast, and how it would share its knowledge with the wider industry about its learnings from the NIP.

A.5.3 Reasons for decision

We recognise the importance of innovation investment in supporting the energy transition and protecting vulnerable customers. There is a need for trials and pilots to test and explore new ideas, concepts and technology before committing to implementation of solutions and rolling these into business-as-usual activities. We therefore acknowledge the potential benefits of having explicit ex-ante innovation funding within the regulatory framework.

Ausgrid has invested in developing an explicit innovation program. Based in the information before us, we found that Ausgrid demonstrated the need for some level of innovation investment, however, it did not provide sufficient evidence to support a $49.2 million totex forecast.

In coming to our position, we have had regard to stakeholder comments which are outlined later in this section. We received a number of submissions about Ausgrid's NIP and innovation funding more generally, showing that there is a strong stakeholder interest in this area of expenditure. While there is support for Ausgrid's NIP, some stakeholders took a more cautious approach in supporting innovation expenditure. We note that almost all submissions requested that the AER provide further guidance on how it would assess explicit ex-ante innovation proposals, and the evidence expected to support these proposals.

In this regard, our final decision sets out our approach to assessing future ex-ante innovation proposals which has been applied in our assessment of Ausgrid's NIP. We also outline performance reporting and oversight of Ausgrid's NIP which we intend to apply to any future innovation proposals. We also intend to release a guidance note about our assessment approach to innovation proposals after taking account of developments and learnings from current innovation programs.

Criteria to assess Ausgrid's NIP

We assessed Ausgrid's revised proposal based on the criteria below:

- the proposed projects in the program must be "innovative"
- the justification for the proposed projects must be linked to the expenditure objectives
- the business has explained how the existing incentive schemes, allowances, government grants and regulatory sandboxing have been considered and genuinely exhausted before considering innovation expenditure
- the proposed projects must be prudent from a scale perspective for a trial/pilot phase. There is also a framework setting out the pathway from trial/pilot to business-as-usual (BAU) phase, including success factors/criteria applied to trials/pilots to assess whether it proceeds to BAU phase
- there is stakeholder support for the innovation expenditure.

A brief explanation of these criteria and our findings against each of the criteria is below. This innovation criteria sets out our requirements for acceptance of explicit ex-ante innovation expenditure.

The projects must be "innovative"

In its submission, the Reset Customer Panel (RCP) draws from the Office of Gas and Electricity Markets (Ofgem) experience and notes the following as a useful starting point in defining an innovative project:[82]

> *A project must be innovative (ie not a business as usual activity) and have an unproven business case entailing a degree of risk warranting a limited Research, Development or Demonstration Project to demonstrate its effectiveness. This could include Projects which are untested at scale, or in relation to which there are risks, which might prevent the widespread deployment of the equipment, technology or methodology.*

We agree with the RCP that the Ofgem experience is a good starting point. Having regard to this definition, we consider that innovative projects should have the following characteristics.

- involve a new concept or technology/technique or activity

  Where these have been already tested on another network, the business must provide justification that an innovation project is required to address implementation risk for this proven concept, technology/technique or activity.

- not be a business-as-usual activity

  A BAU activity would have enough information available to be proposed as expenditure in a business' regulatory proposal.

- have an unproven business case

  As an untested activity, we would not necessarily expect a net positive outcome for an innovation project. In particular, a net positive outcome would indicate that a business

[82] Ausgrid Reset Customer Panel, *RCP Report on Ausgrid Revised Proposal,* 29 November 2023, p. 57.

should invest as a BAU activity, beyond a trial or pilot. However, we would expect that a business could demonstrate the potential benefits to consumers in the event the activity is successful.

- be untested at scale

  Deployment/volume should reflect trial/pilot phase of the testing.

We found Ausgrid partly satisfied this criterion. We have removed 7 projects we found to not meet some of these criteria.

We found several of Ausgrid's proposed projects to not be innovative, applying known solutions already tested in its network. One example of this is the Responsive feeder level load shedding schemes (UFLS) – PR82. This project involves rolling out methods proven in other networks[83] that has already been trialled in Ausgrid's network[84] in addition to exploring other solutions using existing technology. In our view Ausgrid did not provide sufficient detail why a further trial in the forecast period is required and we are of the view this would be considered a business-as-usual activity in response to an underlying need.

The justification for the proposed project must be linked to the expenditure objectives

We found Ausgrid mostly satisfied this criterion, removing one project that was not sufficiently like to the expenditure objectives.

We consider that a business should explain how its proposed projects are linked to the expenditure objectives because these objectives are the service outcomes that are in the long-term interests of consumers.

One project, the Barriers to electrification field trial – PR180, lacked a linkage to the capex objectives. Ausgrid identified this project as aligning with the "Complies with regulatory obligations or requirements" capex objective.[85] However, we found that while this project appears to have an alignment to emissions reduction, it is unclear how this project relates to delivering standard control services or would address an identified underlying need.

The proposed projects cannot be funded elsewhere

We consider that Ausgrid has satisfied this criterion.

We consider that our ex-ante regime and other mechanisms are available to incentivise (for instance, the Service Target Performance Incentive Scheme) as well as directly fund innovation solutions (for instance, the Demand Management Incentive Scheme). We acknowledge that our regulatory framework may not necessarily capture the benefits from trials and pilots at the localised/community level. We expect a business to provide supporting information to demonstrate that it has considered other existing funding mechanisms prior to requesting for explicit innovation funding.

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83 SA Power Networks – Cost pass through application – emergency standards – Public, p.15.

84 Ausgrid – Att. 5.8.1 – Network innovation CBA model – 30 Nov 2023 – Public, PR082 – Responsive feeder level load shedding schemes (UFLS), Project Description

85 Ausgrid – Att. 5.8.1 – Network innovation CBA model – 30 Nov 2023 – Public, PR082 – Barriers to electrification trial, AER Capex Objectives

In response to our draft decision, Ausgrid provided more detail about alternative funding sources it considered and used, such as Demand Management Innovation Allowance (DMIA) [86] and alternative funding from the Department of Climate Change, Energy, the Environment and Water (DCCEEW).[87] Ausgrid notes that the Network Innovation Advisory Committee (NIAC) played a role in ensuring the existing and alternative funding sources were considered by Ausgrid before requesting NIP funding.[88]

The proposed projects must be prudent – deployed at a scale consistent with a trial/pilot

We consider that Ausgrid has partly satisfied this criterion.

We consider that when testing an unproven or new activity on a business' network, it would be prudent to limit rollout/deployment to a level that is consistent with a trial/pilot phase. There is a threshold where these innovative activities could then become business-as-usual activities.

While Ausgrid set out its framework for advancing its trials and pilots to a BAU stage,[89] we found several projects involved volumes that are inconsistent with a trial/pilot phase. One example of this is the Wires Down Detection Device Trials – PR039 that involves installing proven technology in the form of 65 auto-reclosers with broken conductor functionality.[90] This project involved further implementation of proven, available technology to Ausgrid's network. We consider that a prudent investment does not require Ausgrid's proposed level of deployment of the auto-reclosers especially for proven available technology. Our assessment found that a prudent investment would involve a materially scaled back forecast of 10 auto-reclosers with broken conductor functionality. This would provide Ausgrid with the ability to trial different equipment (noting that current standard reclosers appear to have this functionality) and obtain enough information for business-as-usual assessment. We consider this would reflect the incremental cost of trialling this functionality above current practices as opposed to the entire unit cost of a recloser.

Based on the information before us, we have scaled back on 12 projects because these were scaled to a level beyond a trial/pilot phase.

There is stakeholder support for the innovation expenditure

There was a mixed reaction to Ausgrid's NIP.

The RCP submission supports Ausgrid's NIP proposal, noting Ausgrid's deep engagement with customers and the NIAC. It shares Ausgrid's concern that it is unrealistic to apply a similar assessment for business cases used to support traditional expenditure and that it

86 Ausgrid – Att. 5.8 – Network innovation program – 30 Nov 2023 – Public, p.14.

87 Ausgrid – Att. 5.8 – Network innovation program – 30 Nov 2023 – Public, p.15.

88 Ausgrid – Att. 5.8 – Network innovation program – 30 Nov 2023 – Public, p.17.

89 Including the addition of a 50% "safety margin" to costs to account for the uncertainty and higher risks of project failures, cost over-runs and lack of benefits realisation.

90 Ausgrid – Att. 5.8.1 – Network innovation CBA model – 30 Nov 2023 – Public, PR039 – Wires down detection device trials, Project quantities/phasing.

supports Ausgrid's approach of applying the "safety margin". The RCP also supports continued oversight by the NIAC.[91]

The NIAC submits that it strongly endorses Ausgrid's revised NIP. It considers that the existing funding options such as the DMIA are no longer sufficient given the scale of innovation required in the future, and that specific innovation funding is needed to support the evolving energy system as there is a risk that distributed network service providers (DNSPs) will fall back on traditional approaches that are not relevant for future scenarios.[92]

The Voice of Community (VoC) are generally supportive of Ausgrid's innovation program. It considered that it had already been conservative in reducing the amount that Ausgrid spends on such programs and considers innovation to be "very important."[93]

The Public Interest Advocacy Centre (PIAC) commend Ausgrid for its consumer engagement. However, it submits that broad consumer support for innovation is representative of a desire for a modern, efficient energy network rather than a specific suite of research trials and pilot projects at the network level. It also notes that consumer support for innovation is usually predicated on an assumption that the status quo for the businesses is one of backwardness, bloated inefficiency, and unexamined processes. As such, consumer support for innovation may not necessarily be based on identified need, or an assessment of the relative value to be gained.[94]

The Consumer Challenge Panel 26 (CCP26) observe that there has been consistently strong community support for innovation throughout Ausgrid's engagement activities, and the community appears to strongly link the transition to net-zero with DNSP's testing and trialling new technologies. It also refers to PIAC's previous submission where PIAC questioned whether Ausgrid's innovation proposal could already be funded through its regulatory allowance and other regulatory mechanisms.[95]

Other findings about Ausgrid's NIP

We found a number of other issues with Ausgrid's NIP that are likely to overstate costs of its NIP. We encourage Ausgrid to consider these areas of improvement in future processes. We found:

- The cost estimates for some projects to be based on the unit cost of an entire asset rather than the incremental values for innovation purposes. One such example is the

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91 Ausgrid Reset Customer Panel, *RCP Report on Ausgrid Revised Proposal,* 29 November 2023, p. 38-41.

92 Ausgrid Network Innovation Advisory Committee, *Ausgrid Revised Proposal – Network Innovation Program (Attachment 5.8)*, 18 January 2024, p. 1-3.

93 Ausgrid Voice of Community Panel 2023, *Day 3 Workshop – 'What Was Said' Report,* October 2023, p. 1-56.

94 Public Interest Advocacy Centre, *Draft Decision 2024–29: Revenue Determinations: Ausgrid. Endeavour, and Essential Energy,* 19 February 2024, p. 11-12.

95 Consumer Challenge Panel, *Submission to the Australian Energy Regulator's Draft Decision and Ausgrid's,* January 2024, p.11-12

overhead (OH) switch program which has been built with the entire OH recloser cost, as opposed to the incremental cost of implementing wires down capability;[96] and

- The scope of work for several projects includes activities such as "developing a specification, market sourcing strategy, standard design, site specific designs, operating manuals, safety processes and a trial plan." Typically, we would consider these activities standard procurement activities that DNSPs undertake on a regular basis for projects of all scales. These costs are usually categorised as overheads and performed by specific business areas, and therefore their inclusion in the NIP would be a double count of overhead costs.

Our alternative forecast

As noted above, based on our analysis of Ausgrid's proposal, our alternative forecast of $17 million is based on three adjustments to Ausgrid's $49.2 million NIP forecast:

- reducing the volumes in projects that are over-scaled to a level appropriate for a trial or pilot. This involves the scaling back of 12 projects;
- removing projects that are not innovative. This involves the removal of 7 projects; and
- removing projects that are not clearly linked to the capex objectives. This involves the removal of 1 project.

Performance monitoring and oversight of the NIP

We consider that the NIAC has been an important factor to ensuring that innovation projects are consumer-centric and therefore support the continuation of its oversight role.

We also consider that performance reporting arrangements be put in place to assess that this new area of expenditure continues to be in long term interests of consumers. We therefore suggest the following arrangements over the 2024–29 period:

- We agree with Ausgrid's proposal to report on its innovation expenditure through the AER's RIN or RIO process;
- For Ausgrid and NIAC to present to the AER at the end of each year in the 2024–29 period, the progress to date of its investments; and
- A post-implementation report by the NIAC of a random selection of the most material projects in the innovation program.

A.6 Dedicated LV circuit reconfiguration

A.6.1 AER's final decision

We do not accept Ausgrid's forecast of $80.5 million for its dedicated LV circuit reconfiguration program would form part of a total capex forecast that reasonably reflects the capex criteria. We have included $56.1 million for this program in our alternative capex forecast, which is 31.3% lower than Ausgrid's proposal, and in line with our draft decision.

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[96] Ausgrid – Att. 5.8.1 – Network innovation CBA model – 30 Nov 2023 – Public, PR039 – Wires down detection device trials, Project Description

A.6.2 Ausgrid's proposal

Ausgrid proposed $80.5 million to remove overhead LV conductors that are used to provide public lighting. This forecast is 43.9% lower than its forecast of $143.5 million in its initial proposal.

Ausgrid submits that the driver of this program is to mitigate safety risk from dedicated street light mains conductor failures. However, it also noted the larger benefit contribution comes from the avoided unserved energy experienced by customers and considers that this explains the higher forecast expenditure relative to the current period of $39 million.[97]

In response to our draft decision, Ausgrid has: [98]

- applied a lower unit rate with the same volume of work. Ausgrid submits that this is as a result of a top-down challenge to align its forecast unit rate more closely with historical unit costs;
- updated its cost benefit analysis to include other feasible options;
- applied sensitivity testing to the disproportionality factor on safety and confirmed that the difference is negligible in this circumstance;
- determined a set of Probability of Event (PoE) parameters indicating 86.4% of incidents will result in a potential loss of supply situation while 8.1% of incidents will result in a potential public safety situation, indicating that the primary driver of the investment is to maintain reliability (not safety); and
- provided additional information regarding its risk of supply loss against lived experience and failure forecasts.

A.6.3 Reasons for decision

We acknowledge Ausgrid's efforts in providing additional information to address concerns set out in our draft decision, as well as reducing its unit costs. We also appreciate the constructive meeting post-submission of the revised proposal to better understand Ausgrid's proposal.

Overall, we found that Ausgrid has provided information to support the prudency of investment for this program however, it did not provide sufficient evidence in the efficiency of its forecast of $80.5 million, which is a 105% step up from a current period spend of $39 million. We came to this position because:

- There was a lack of evidence to support the step up in expenditure from historical levels especially when we observe current period actual failure numbers. For instance, during the FY17–21, there were a total of 98 recorded failure events attributed to dedicated LV main conductor failures or an average of 19.6 annual failures.[99] This contrasts with Ausgrid's modelled forecast of 705 failures in FY25, increasing to 815 in FY29. This is

97 Ausgrid, *Attachment 5.4 Replacement*, 30 November 2023, p.10-11.

98 Ausgrid, *Attachment 5.4 Replacement*, 30 November 2023.

99 Ausgrid, Response to information request 059 – Repex, 19 January 2024, p. 2

an exponential order of magnitude higher than historical levels. Ausgrid was unable to provide sufficient justification to explain the drastic increase in anticipated failures;

- Our review of the provided material also indicates the FY20–FY23 current failure rate could be maintained at a lower level of replacement than the amount proposed by Ausgrid.[100] This is because Ausgrid submitted that a total of 87km of reconfiguration would maintain the average FY20–23 failure rate, well below the proposed 2,875km of reconfiguration;
- We consider Ausgrid has incorrectly applied cost benefit analysis for this program. Ausgrid indicated that to maintain reliability across the network, it is necessary and efficient to overinvest in this program due to the likely degradation of reliability in other asset classes and areas across the network. If Ausgrid can demonstrate an overall degradation of reliability at a whole of network level after optimising its replacement portfolio (and other business as usual activities), we would expect Ausgrid to submit a separate standalone reliability program (augex) with a positive net benefit or a compliance program (augex) to meet the minimum reliability standards as outlined in Schedule A of its Distribution Licence[101] along with any appropriate STPIS target adjustments.

For these reasons, we consider that our alternative forecast of $56.1 million which is higher than its current period spend of $39 million is sufficient funding for this program.

A.7 Updated repex costs

A.7.1 AER's final decision

We do not accept Ausgrid's forecast of $26 million to update costs for major repex projects would form part of a total capex forecast that reasonably reflects the capex criteria. We have included $24 million in our alternative capex forecast.

Ausgrid revised its forecast on 14 February 2024 from $39 million to $26 million after feedback from the AER.[102]

A.7.2 Ausgrid's proposal

Ausgrid submits that new information has led to additional repex funding required being required; these being:[103]

- Latest load forecasts that bring forward the Drummoyne substation and 132kV cables replacement by one year ($7 million additional);
- Latest load forecasts that bring forward the Paddington 33kV cables replacement by one year ($6 million additional);
- Updated site information driving a change in solution that means an increase in the cost of the Merewether 33kV switchgear replacement project ($21 million additional); and

100 Ausgrid, Response to information request 059 – Repex, 19 January 2024

101 IPART, Distribution Licence – Ausgrid Operator Partnership, 7 September 2023.

102 Ausgrid, Letter to the AER – Amendments to the Revised Proposal, 14 February 2024.

103 Ausgrid, Attachment 5.4 – Replacement, 30 November 2023, p. 16-19.

- Flow on impacts from Transgrid protection work requiring an increase in protection system upgrades ($5 million additional).

After some feedback from the AER, Ausgrid revised its forecast further by withdrawing the amendments to the Drummoyne and Paddington projects from the revised proposal.[104] In particular, we found that:

- likely cost reductions on other major projects offset Ausgrid's proposed cost increases. We reviewed Ausgrid's December 2023 Distribution Transmission Annual Planning Report (DTAPR) to confirm the forecast cost increases, as well as the reductions in other major project costs which Ausgrid did not have regard to in its revised proposal; and
- the additional costs for the Drummoyne and Paddington projects are based on the optimum date for replacement being close to the final/fifth year of this regulatory control period. Investments at and around this date is highly sensitive to demand forecasts which brings into question the reasonableness of the forecast given the likelihood of deferral to the subsequent period.

A.7.3 Reasons for decision

While we discourage NSPs from seeking additional capex in areas we have already accepted in our draft decisions, we consider some projects to relate to unique circumstances outside of Ausgrid's control.

We appreciate the constructive engagement with Ausgrid on the updated repex costs and its willingness to take on our feedback. Our alternative forecast of $24 million includes Ausgrid's $5 million forecast for additional protection system upgrades and $19 million for the cost increase from the Merriweather replacement project.

We came to this position because Ausgrid provided sufficient evidence to confirm that Transgrid's protection upgrade project will increase Ausgrid's requirement to replace the protection schemes of its 132kv feeders. This evidence includes Transgrid's RIT-T and the confirmation between Transgrid and Ausgrid on its scope of works.[105]

We have lowered Ausgrid's forecast for its Merriweather replacement project by $2 million to better reflect the likely delivery timeframe of this project. We found that Ausgrid assumes this project takes 5 years to complete although the project used to derive the estimate (Peakhurst substation) took over 6 years to complete. Ausgrid have provided sufficient evidence to confirm that the original scope of work of $3 million is no longer feasible due to site conditions rather than internal planning changes.

We received a submission about these updated repex costs. The CCP26 noted that it did not observe substantive engagement on these matters and therefore cannot comment on these updated costs.[106]

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104 Ausgrid, Letter to the AER – Amendments to the Revised Proposal, 14 February 2024.

105 Ausgrid, *Sydney East Protection Upgrade Meeting Minutes*, 7 February 2024 – Confidential

106 CCP26, *Submission the Australian Energy Regulator's Draft Decision and Ausgrid's Revised Proposal*, January 2024, p.4.

A.8 Capitalised overheads

A.8.1 AER's final decision

We have included $690.7 million in our alternative estimate of total capex. This is $33 million (4.6%) lower than Ausgrid's revised forecast. Our final decision accounts for data and CPI discrepancies as well as our alternative estimate of total direct capex.

A.8.2 Ausgrid's proposal

Ausgrid's revised proposal submitted $723.7 million in capitalised overheads for the 2024–29 period. Ausgrid's revised proposal used the same forecasting approach as its initial proposal including applying a 0.5% productivity adjustment.[107]

Ausgrid's forecasting approach differs from our standard approach by using the most recent five years of actual capex and overheads. By comparison, our standard approach uses all available (four) years of actual capex and overheads from the current 2019–24 period.

A.8.3 Reasons for decision

Our final decision considers Ausgrid's approach suitable to forecast capitalised overheads. This is consistent with our position from the draft decision.[108]

We have used Ausgrid's methodology including five years of actual expenditure and a 0.5% productivity adjustment to determine the alternative forecast for overheads. Our final decision updates three elements of Ausgrid's revised proposal:

- Correction for data discrepancies. We identified some minor data discrepancies in Ausgrid's actual total capex inputs for years 2019–20 and 2021–22. We have corrected these in our alternative estimate.[109]
- Correction for escalation. We identified that Ausgrid's CPI used for escalation was correct but didn't align with the relevant financial year. We have corrected this in our alternative estimate.[110]
- Input our alternative estimate of total direct capex. This includes the treatment of SaaS as opex consistent with our draft decision. Our lower alternative estimate of total direct capex contributes to a lower forecast of capitalised overheads.

The correction for data and CPI discrepancies accounts for approximately half of the $33 million difference between Ausgrid's revised proposal and our alternative estimate.

Ausgrid's revised proposal did not explain why it decided to use five years of actual expenditure. We found that using five years of actual expenditure resulted in a slightly lower estimate of overheads than our standard approach of four years.

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107 Ausgrid, Attachment 5.1 – Proposed capital expenditure, 30 November 2023, p. 39.

108 AER - Draft Decision Attachment 5 - Capital expenditure - Ausgrid - 2024–29 Distribution revenue proposal - September 2023, p. 54.

109 Ausgrid, *Response to information request 071 – Capitalised overheads*, 9 February 2024, 'Calulation'!J20,L20.

110 Ausgrid, *Response to information request 071 – Capitalised overheads*, 9 February 2024, 'Calulation'!I14:M14.

In addition to the standard method for calculating capitalised overheads, Ausgrid have applied an annual 0.5% productivity adjustment to its capitalised overheads forecast. This adjustment was done in response to stakeholder engagement with the Reset Customer Panel as an affordability measure and has been in place since its initial proposal. We commend Ausgrid for maintaining its affordability measure in its revised proposal.

A.9 Modelling adjustments

Our final decision includes the following modelling adjustments:

- Minor updates to consumer price index (CPI) accounting for actual inflation to December 2023.
- Labour real cost escalation based on BISOE and KPMG forecasts.

A.9.1 Updates to inflation and real cost escalation

Table A.7 and Table A.8 show the modelling adjustments we have made to reflect the latest inflation data in our roll forward model (RFM) and post-tax revenue model (PTRM), and updated labour real cost escalators in line with our opex alternative estimate (Attachment 6 – Operating expenditure).

Table A.7 Modelling adjustments for inflation and real cost escalation (%)

Cost escalator	2022-23	2023-24	2024-25	2025-26	2026-27	2027-28	2028-29
Ausgrid Transgrid's inflation[(a)]	7.83	4.10	NA	NA	NA	NA	NA
AER's inflation[(a)]	7.83	4.05	NA	NA	NA	NA	NA
Ausgrid's real labour	-3.44	0.59	1.35	1.43	0.89	0.82	0.98
AER's real labour	-3.54	0.16	1.49	1.49	0.91	0.80	0.92

Source: AER analysis and Ausgrid's proposal.
Note: (a) for the purpose of the capex forecast in $2023–24, only the CPI for 2022–23 and 2023-24 are relevant as Ausgrid's base inputs are in $2021–22 June.

Table A.8 Cost escalation impact to AER final decision capex forecast ($ million, $2023–24)

	2024-25	2025-26	2026-27	2027-28	2028-29	Total
AER final decision, using Ausgrid's inflation and cost escalation assumptions	643.5	579.1	591.4	557.2	517.3	2,888.6
AER final decision, using updated inflation and cost escalation	642.2	578.0	590.3	556.1	516.1	2,882.7
Difference ($)	-1.4	-1.2	-1.1	-1.1	-1.2	-6.0

Source: AER analysis. Totals may not sum due to rounding.

It is worth noting that the inflation adjustment resulted in a $1.4 million decrease, while the labour real cost escalators adjustment resulted in a $4.6 million decrease, in the 2024–29 period.

B Contingent Projects – Macquarie Park

Contingent projects are usually significant network augmentation projects that are reasonably required to be undertaken in order to achieve the capex objectives. However, unlike other proposed capex projects, the need for the project within the regulatory control period and the associated costs are not sufficiently certain. Consequently, expenditure for such projects does not form a part of the total forecast capex that we approve in this determination. Such projects are linked to unique investment drivers and are triggered by defined 'trigger events'. The occurrence of the trigger event must be probable during the relevant regulatory control period.[111] The cost of the projects may ultimately be recovered from customers in the future if certain predefined conditions (trigger events) are met.

This appendix details our assessment of Ausgrid's Macquarie Park contingent project proposal as part of its revised proposal for the 2024-29 regulatory control period.

B.1.1 AER's final decision

Our final decision is to accept Ausgrid's proposed Macquarie Park contingent project for the 2024–29 regulatory control period. We have concluded that Ausgrid's $128 million contingent project may be reasonably required to be undertaken in order to achieve the capex objectives over the 2024–29 period.[112]

B.1.2 Ausgrid's proposal

In its revised proposal, Ausgrid included a contingent project for a new sub-transmission substation (STS) in Macquarie Park called Wallumatta STS. The proposed scope of works for the new substation comprises land acquisition of $25 million, substation construction of $44 million and underground transmission cables of $59 million (total of $128 million).

The contingent project was not included in Ausgrid's initial proposal. Ausgrid stated that between lodging its initial and revised proposals, it received three formal connection enquiries from customers with large load requirements, which would require a new substation. It considered including the project as augex in its revised proposal, but as formal connection applications were yet to be received, it decided to propose a contingent project.

Ausgrid noted the Macquarie STS was commissioned in Macquarie Park in 2021 to supply large customers at 33kV. The three new enquiries are also requesting a 33kV supply by FY2028–29. However, Ausgrid states the Macquarie STS 33kV supply points will be fully utilised by existing customers by 2026 and that there are no other spare 33kV supply points in the area. Hence, Ausgrid submits that if it does not build a new substation to accommodate these potential new customers, it will fail to meet its requirements under the NER.[113]

The proposed Macquarie Park contingent project involves:

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111 NER, cl. 6.6A.1(c)(5).

112 NER, cl. 6.6A.1(b)(1).

113 NER, cll. 6.5.7(a)(1), 5.2.3(d).

- Acquisition of property at a location in relative proximity to the data centre loads;
- Construction of the new Wallumatta STS with an arrangement of three 132/33kV transformers and four busbar sections of 33kV switchgear;
- Installation of 5km, 2x132kV underground transmission cables from East Ryde Transition Point to connect feeders 92G and 92J to the New Wallumatta STS; and
- Installation of ductlines to facilitate 33kV connections into the new Wallumatta STS.

Ausgrid stated that should the AER approve an application for this contingent project, it will structure the capex so that no revenue associated with the investment is recovered in the 2024–29 period.[114] Ausgrid noted that this is one of its affordability measures.

In its report on Ausgrid's revised proposal, the RCP supported the contingent project proposal in principle.[115] It highlighted the following points that it has not had sufficient time to form a concluded view about:

- Ausgrid must ensure that its proposed affordability measures are included in the implementation of the contingent project. This relates to the timing of expenditure being included in the RAB.[116]
- Modelling the proposed triggers on Endeavour's contingent project for the 2019–24 draft decision does not meet the relevant tests under the NER.[117]

The CCP26 submitted that it does not consider that the treatment of the Macquarie Park substation as a contingent project represents a bill saving for customers. It considers that Ausgrid has not provided meaningful grounds to explain why this would be included in its affordability measures.[118]

B.1.3 Assessment approach

A contingent project should reflect a project that Ausgrid can reasonably expect would occur in the 2024–29 period, with uncertainty related to the scope, timing and costs of the contingent project.

We reviewed Ausgrid's proposed contingent project against the assessment criteria in the NER. We considered whether:

- the proposed contingent project is reasonably required to be undertaken in order to achieve any of the capex objectives[119]

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114 Ausgrid, Attachment 5.1 – Proposed capital expenditure, 30 November 2023, p. 40.

115 RCP, *RCP Report on Ausgrid's Revised Proposal*, 29 November 2023, p. 20.

116 RCP, *RCP Report on Ausgrid's Revised Proposal*, 29 November 2023, pp. 19-20.

117 RCP, *RCP Report on Ausgrid's Revised Proposal*, 29 November 2023, p. 20.

118 CCP26, *Submission to the Australian Energy Regulator's Draft Decision and Ausgrid's Revised Regulatory Proposal*, January 2024, p. 9.

119 NER, cl. 6.6A.1(b)(1). Relevantly, a distribution NSP must include forecast capex in its revenue proposal which it considers is required in order to meet or manage expected demand for standard control services over the regulatory control period (see NER, cl. 6.5.7(a)(1)).

- the proposed contingent project capex is not otherwise provided for in the capex proposal[120]
- the proposed contingent project capex reasonably reflects the capex criteria, taking into account the capex factors[121]
- the proposed contingent project capex exceeds the defined threshold[122]
- the trigger events in relation to the proposed contingent project are appropriate.[123]

When determining whether a trigger event is appropriate, we assess whether is it required:

- to be reasonably specific and capable of objective verification[124]
- to be a condition or event which, if it occurs, makes the project reasonably necessary in order to achieve any of the capex objectives[125]
- to be a condition or event that generates increased costs or categories of costs that relate to a specific location rather than a condition or event that affects the transmission network as a whole[126]
- to be described in such terms that it is all that is required for the revenue determination to be amended[127]
- to be a condition or event, the occurrence of which is probable during the 2024–29 period but the inclusion of capex in relation to it (in the total forecast capex) is not appropriate because either:
  - it is not sufficiently certain that the event or condition will occur during the regulatory control period or if it may occur after that period or not at all, or
  - assuming it meets the materiality threshold, the costs associated with the event or condition are not sufficiently certain.[128]

As part of our assessment, we reviewed whether the proposed contingent project is reasonably likely to be required in the 2024–29 regulatory control period based on the materiality and plausibility of the trigger events. This gives us a high-level view of whether the project is reasonably required to be undertaken in the regulatory control period in order to achieve any of the capex objectives and reflect the capex criteria.

Ausgrid provided a business case for the Macquarie Park contingent project. We conducted a high-level assessment of its preferred option against the alternatives. We engaged Ausgrid and sought additional information about its options analysis and proposed trigger events.

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120 NER, cl. 6.6A.1(b)(2)(i).
121 NER, cl. 6.6A.1(b)(2)(ii).
122 NER, cl. 6.6A.1(b)(2)(iii).
123 NER, cl. 6.6A.1(b)(4).
124 NER, cl. 6.6A.1(c)(1).
125 NER, cl. 6.6A.1(c)(2).
126 NER, cl. 6.6A.1(c)(3).
127 NER, cl. 6.6A.1(c)(4).
128 NER, cl. 6.6A.1(c)(5).

While we have considered the project scope proposed by Ausgrid, we are not required to determine the most efficient scope and costs during our assessment of a contingent project proposal.

B.1.4 Reasons for decision

Ausgrid's proposed forecast capex of $128 million for the contingent project exceeds the materiality threshold of approximately $90 million.

We consider it is probable for Ausgrid to receive connection request(s) for additional load during the 2024–29 regulatory control period that its existing infrastructure cannot supply in the Macquarie Park network. Should this event occur, we accept that Ausgrid would be reasonably required to incur expenditure in order to achieve the capex objectives.[129]

Ausgrid provided a business case for the contingent project, which outlined a range of options considered to meet the expected increased demand. All other options pursued included building new substations but connecting to different feeders. Ausgrid stated its preferred option is the lowest cost and has manageable project delivery risks.

The business case also outlined some options considered but not pursued. This included:

- New 132/66kV substation
- Direct supply at 132kV
- Non-network options

Ausgrid provided two trigger events in its revised proposal:

- A formal request from a number of major customers requiring connection within a timeframe that necessitates investment within the 2024–29 regulatory control period.
- Confirmation that the proposed network solution maximises the net market benefits following completion of the RIT-D process.

On reviewing Ausgrid's options analysis and its preferred option, we believe there is uncertainty over the most efficient option. However, we agree it is probable that some action will be reasonably required and consider a RIT-D appropriate to identify the most credible option. Accordingly, we worked with Ausgrid on its trigger events such that they do not preclude other options being preferred from a RIT-D process.

Ausgrid submitted the following amended trigger events:

- Ausgrid receives a connection application or applications for loads in Macquarie Park that cannot be supplied from the existing Macquarie Park Zone Substation or the Macquarie Sub-transmission Substation.
- The AER is satisfied that Ausgrid has completed a Regulatory Investment Test for Distribution (RIT-D) to determine the preferred credible option to connect and supply the load or loads, pursuant to the NER.

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129 NER, cl. 6.5.7(a)(1).

- A commitment from Ausgrid to proceed with the preferred credible option from the RIT-D, subject to the AER amending Ausgrid's 2024-29 regulatory determination pursuant to the NER. To provide objective verification of this trigger, a letter from the Chief Executive Officer of Ausgrid will be sent to the AER to confirm such commitment.

We consider Ausgrid's amended trigger events are appropriate. Given the uncertainty over the most efficient option, we are satisfied that trigger events allow for a RIT-D to determine the efficient expenditure required to achieve the capex objectives.

We are aware that is it possible a RIT-D could result in an option with forecast capex below the materiality threshold. We note that part of our assessment of a contingent project application is to reconsider the materiality threshold relating to forecast capex included in the application.[130]

[130] NER, cll 6.6A.2(e), 6.6A.2(f)(1).

Shortened forms

Term	Definition
ACS	alternative control services
AEMC	Australian Energy Market Commission
AEMO	Australian Energy Market Operator
AER	Australian Energy Regulatory
ASP	Accredited Service Provider
capex	capital expenditure
CCP26	Consumer Challenge Panel, sub-panel 27
CESS	capital expenditure sharing scheme
CSIS	customer service incentive scheme
DER	Distributed Energy Resources
DMIAM	demand management innovation allowance mechanism
DMIS	demand management incentive scheme
DNSP or distributor	Distribution Network Service Provider
DUoS	Distribution Use of System Charges
EBSS	efficiency benefit sharing scheme
ECA	Energy Consumers Australia
ENA	Energy Networks Australia
ESB	Energy Security Board
EV	electric vehicle
F&A	framework and approach
GSL	guaranteed service level
ICT	information and communication technologies
NEL	National Electricity Laws
NEM	National Electricity Market
NEO	National Electricity Objectives
NER	National Electricity Rules
opex	operating expenditure
PIAC	Public Interest Advocacy Centre
RAB	regulated asset base
RCP	Reset Customer Panel

Term	Definition
RCP	Representative Concentration Pathway
repex	replacement expenditure
SAIDI	system average interruption duration index
SAIFI	system average interruption frequency index
SAPS	stand-alone power systems
SCS	standard control service
Service classification guideline	Electricity distribution service classification guideline 2018
STPIS	service target performance incentive scheme
Totex	total expenditure (capex plus opex)
WACC	Weighted average cost of capital