EMCa

energy market consulting associates

AusNet Services 2026 - 2031 Regulatory Proposal

# REVIEW OF ASPECTS OF PROPOSED NETWORK RELATED EXPENDITURE AND CER

## Public Version

Report prepared for:

AUSTRALIAN ENERGY REGULATOR (AER)

August 2025

## Preface

*This report has been prepared to assist the Australian Energy Regulator (AER) with its determination of the appropriate revenues to be allowed for the prescribed distribution services of AusNet from 1st July 2026 to 30th June 2031. The AER's determination is conducted in accordance with its responsibilities under the National Electricity Rules (NER).*

*This report covers a particular and limited scope as defined by the AER and should not be read as a comprehensive assessment of proposed expenditure that has been conducted making use of all available assessment methods nor all available inputs to the regulatory determination process. This report relies on information provided to EMCa by AusNet. EMCa disclaims liability for any errors or omissions, for the validity of information provided to EMCa by other parties, for the use of any information in this report by any party other than the AER and for the use of this report for any purpose other than the intended purpose. In particular, this report is not intended to be used to support business cases or business investment decisions nor is this report intended to be read as an interpretation of the application of the NER or other legal instruments.*

*EMCa's opinions in this report include considerations of materiality to the requirements of the AER and opinions stated or inferred in this report should be read in relation to this over-arching purpose.*

*Except where specifically noted, this report was prepared based on information provided to us prior to 1 June 2025 and any information provided subsequent to this time may not have been taken into account. Some numbers in this report may differ from those shown in AusNet's regulatory submission or other documents due to rounding.*

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# ABBREVIATIONS

| Term | Definition |
|---|---|
| ACR | Operations of Automatic Circuit Recloser |
| ACS | Alternate Control Service |
| ACSR | Aluminium conductor steel reinforced |
| ADMS | Advanced Distribution Management System |
| AEMC | Australian Energy Market Commission |
| AEMO | Australian Energy Market Operator |
| AER | Australian Energy Regulator |
| AFAP | Australian Far as Possible |
| AI | Artificial Intelligence |
| AMI | Advanced Metering Infrastructure |
| AMS | Asset Management Strategy |
| ARM | Machine Learning model |
| ASD | Ausnet Distribution |
| Augex | Augmentation expenditure |
| BA | Boric Acid |
| BAU | Business As Usual |
| BC | Business Case |
| BDR | Behavioural Demand Response |
| BESS | Battery Energy Storage System |
| BWA | Barnawartha zone substation |
| CBA | Cost Benefit Analysis |
| CBTS | Cranbourne Terminal Station |
| CER | Consumer Energy Resources |
| CLN | Clyde North zone substation |
| CoC | Cost of Consequence |
| DLC | Direct Load Control |
| DNSP | Distribution Network Service Provider |
| DTC | Distribution Transfer Capacity |
| DVM | Dynamic Voltage Management |
| EAR | Energy At Risk |
| EDO | Expulsion Drop-out |
| EFD | Early Fault Detection |

| Term | Definition |
|---|---|
| ESMS | Electricity Safety Management System |
| EUE | Expected Unserved Energy |
| EV | Electric Vehicle |
| FLCM | Fire Loss Consequence Model |
| HBRA | High Bushfire Risk Area |
| ICT | Information Communication Technology |
| ISP | Integrated System Plan |
| KLO | Kalkallo zone substation |
| LBRA | Low Bushfire Risk Area |
| LDC | Load Duration Curve |
| LGA | Local Government Area |
| LiDAR | Light Detection and Ranging |
| MEC | Major Electricity Company |
| MEDs | Major Event Days |
| MFA | Maffra zone substation |
| MWTS | Morwell Terminal Station |
| NER | National Electricity Rules |
| next RCP | 2026-2031 |
| NMM | Network Model Management |
| NPV | Net Present Value |
| NSP | Network Service Provider's |
| OFR | Officer zone substation |
| OT | Operational Technology |
| PACR | Project Assessment Conclusions Report |
| PADR | Project Assessment Draft Report |
| PBST | Powerline Bushfire Safety Taskforce |
| PHM | Pakenham zone substation |
| PoF | Probability of Failure |
| PRF | Powerline Replacement Fund |
| PSCR | Project Specification Consultation Report |
| RCP | Next Regulatory Control Period |
| REFCL | Rapid Earth Fault Current Limiter |
| repex | Replacement expenditure |
| RIN | Regulatory Information Notice |
| RIS | Regulatory Impact Statement |

| Term | Definition |
|---|---|
| RIT | Regulatory Investment Test |
| RP | Regulatory Proposal |
| SCADA | Supervisory Control and Data Acquisition |
| SCS | Standard Control Service |
| SLE | Sale zone substation |
| SMR | Seymour zone substation |
| TGN | Traralgon zone substation |
| URDs | Underground Residential Developments |
| USE | Unserved energy |
| VBRC | Victorian Bushfire Royal Commission |
| VCR | Value of Customer Reliability |
| VMS | Vegetation Management System |
| WGI | Wonthaggi zone substation |
| WGL | Warragul zone substation |
| WO | Wodonga Zone Substation |
| WOTS | Wodonga Terminal Station |
| ZSS | Zone Substation |

# EXECUTIVE SUMMARY

## Introduction and context

1. The AER has engaged EMCa to undertake a technical review of aspects of the replacement expenditure (repex), augmentation expenditure (augex) including network-related consumer energy resources (CER) and electrification augex, and certain opex step changes that AusNet has proposed in its regulatory proposal (RP) for the 2026-31 Regulatory Control Period (next RCP).[1]
2. The assessment contained in this report is intended to assist the AER in its own analysis of the proposed capex and opex allowances as an input to its draft determination on AusNet's revenue requirements for the next RCP.

## Expenditure under assessment

### Proposed repex

3. AusNet has proposed a repex forecast of $1,317 million. This is 74% above the repex included in the capex allowance for the current RCP and $527.6 million (or 67%) above the repex that it expects to incur in the current RCP.
4. AusNet refers to deteriorating asset condition and increasing unit rates as the key drivers for the increase in repex. AusNet's proposed repex is made up of asset replacement, safety and compliance programs. We have undertaken our review at the project and program level, mindful of how the projects and programs aggregate to compare against longer term trends at the category level.
5. We have been asked to review projects with aggregate proposed repex of $828 million, including OT of $40 million which we assess in our companion ICT report. These projects comprise part of AusNet's aggregate total proposed repex as above.

### Proposed augex

6. AusNet has proposed an augex forecast of $959.9 million[2]. Including overheads, this is equivalent to $1,030 million which would be $631m (or 158%) above the augex that it expects to incur in the current RCP.
7. AusNet's proposed augex is made up of demand and non-demand driven projects. The non-demand projects within our scope of review are included within the safety, compliance, and large renewables enablement programs.
8. We have been asked by the AER to consider projects and programs with aggregate expenditure of $678.4 million, which is approximately 70% of the proposed augex by AusNet. The AER nominated specific projects and programs from AusNet's capex model for our review, and which include a combination of demand and non-demand driven projects.
9. The proposed Compliance augex that we have been asked to review is for two CER integration projects, which we discuss in section 5,[3] along with $138.5 million of the proposed Demand-driven augex for LV electrification and which is also to address CER. Together these total $173.8 million.

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1 In separate reports, we cover our assessment of AusNet's proposed ICT and cyber security expenditure. This includes related opex step changes.

2 AusNet Regulatory Proposal, table 6-3

3 This comprises the Steady State Voltage Compliance project of $26.9 million and the Supply Improvement reactive program of $8.4 million, both of which are reviewed in section 5

10. Our findings relate specifically to the projects and programs included in our review.

### Proposed CER-related expenditure

11. We have been asked to review specific CER and electrification programs. In addition to the two augex projects referred to above, this includes an ICT project (DSO Hub) and proposed CER-related opex step changes.

12. Of AusNet's proposed total CER-related expenditure of $266.7 million:

- $254.9 million is for capex, with $214.1 million being CER-related augex, of which $173.8m is within the scope of our review as above[4]
- $40.8 million is for ICT capex, and
- AusNet proposes a further $11.8 million as opex step changes.

### Proposed opex step changes for pole inspection, early fault detection and hazard tree management

13. In the current report, we have reviewed three of the proposed opex step changes totalling $30.9 million for pole inspection, hazard tree reduction and early fault detection. AusNet presents the opex step changes within our scope of review as responding to:

- Regulatory change: pole inspection, and
- Capex-opex trade-off: early fault detection and hazard tree program.

## Assessment and findings

### Assessment of governance, management and forecasting methods

14. In considering AusNet's expenditure governance, management and forecasting methodologies, we focus primarily on matters which we consider impact the forecast expenditure requirements that we have been asked to review, as detailed in the subsequent sections of this report.

15. We found that Victorian DNSPs' regulatory proposals, including AusNet's, reflect changes impacting the industry; however, we found that the way in which each DNSP proposes to respond to these changes differs and which was a feature of our review.

16. In our review of the governance, management and forecasting methods that AusNet applied by AusNet in determining its forecast expenditure, we found examples of the following issues:

- AusNet's initial submission lacked quality information
- AusNet has applied top-down adjustments to its forecast expenditure, including the deferral of some projects in its proposed expenditure
- A large proportion of repex is based on inspection-based methods, and not based on economic analysis
- We found instances where the modelling methods that were applied by AusNet were flawed
- The economic analysis relies heavily on the input assumptions that AusNet has applied, but which are not always supportable
- Application of risk allowances to development of cost estimates to determine expected costs vary across the forecast, and

[4] We have not been asked to review AusNet's proposed augex of $40.4 million for CER enablement, which is included in the augex of $214.1 million referred to here.

- AusNet's approach to its deliverability assessment is reasonable, however the magnitude of the proposed increases (including expenditure beyond our scope of review) presents major delivery challenges.

17. We saw evidence of many of these issues in the projects and programs that we were asked to review and have considered the implications of these findings in our determination of an alternate estimate of the forecast expenditure requirements.

## Assessment of proposed repex

### Substation-related repex programs include a higher level of expenditure than is indicated by AusNet's models after adjustment for more reasonable methods and inputs

18. We find that AusNet's proposed program is made up of substation rebuild projects deferred from the current RCP and new projects for the next RCP. Based on AusNet's application of its post model adjustments, and general capex smoothing, the timing of the substation rebuild projects has included some deferral. However, we are not convinced by AusNet's timing analysis and expect that here may be further deferral of some projects, resulting in expenditure being incurred beyond the next RCP.

19. For substation projects (including rebuild, plant and secondary systems) we found that the analysis was sensitive to changes in the VCR applied by AusNet, and application of the values included in the 2024 AER VCR study results in deferral of the timing of some projects.

20. We also found application of some of the probability of failure distributions that AusNet had applied had not been adequately calibrated against its observed experience, or instances where its modelling indicated a step increase in replacement volumes that should have necessitated a review of replacement volumes using other methods.

21. We consider that the method applied by AusNet to determine its program based on positive NPV is an indicator of the timing, and not necessarily a determination of the point at which the NPV is maximised for a single project or portfolio of projects, or when subject to reasonable sensitivity analysis. To rely on this type of analysis tends to result in a higher program than is efficient.

### Distribution lines-related programs largely based on historical trend of condition, with proposed increases that are not sufficiently justified

22. AusNet states that the asset replacement volumes that it has proposed represent slight increases on its historical replacement. However, upon closer review, we find elements of the program that are not sufficiently supported. This is particularly the case for poles repex, whereas for crossarms the volume is lower than AusNet has been incurring.

23. For conductor repex, whilst the volumes are similar, the total replacement volumes when considering the addition of the safety and compliance programs represents a material step increase.

24. We consider that analysis of alternate volumes for intervention, and which may extend to different forecasting methods and/or the impact to risk of higher or lower intervention volumes is a key consideration in demonstrating a prudent and efficient intervention volume.

### For the safety-driven programs we have reviewed, we found similar issues to the asset replacement programs

25. AusNet's safety program comprises the replacement of conductor, SWER earths and fuses. For conductor replacement, these programs are in addition to those included as part of its asset replacement and compliance driven repex. We consider that analysis of the prudent and efficient conductor replacement should take account of the total volume of conductor replacement targeted under each of these programs. To that end, we consider that AusNet has not sufficiently justified parts of its proposal including the proposed proactive insulation of its SWER network. AusNet has not provided an economic analysis to support its

proposed increase in proactive insulation of its SWER network, stating that the program was included based on 'managing average bills broadly stable in real terms.'

26. For other conductor replacement programs, we consider that the relatively low volume of replacement that AusNet has proposed for its condition-based conductor programs are reasonable. However, in parts we found some examples of unit rates that differed from AusNet's published unit rates and which suggests that these rates are reflected in the forecast expenditure.

27. We find that the programs targeting the SWER earths are reasonable, however the proposed uplift that it has proposed for the proactive fuse program is not. AusNet has not demonstrated that the uplift is economic, or that the performance of the network is declining such that the uplift is prudent to undertake.

### Included compliance-driven expenditure reflects a reasonable and prudent approach

28. For the compliance-driven programs we have reviewed, we consider that the low/service conductor programs comprising its reactive rectification program, and data capture are reasonable, and reflect a prudent option.

## Assessment of proposed augex (excluding CER)

### Completion of the fall arrest system project is reasonable, however the EFD program is not justified

29. We consider that the proposed capex for Fall Arrest System is reasonable and reflects a prudent and efficient forecast of the proposed capex. However, we are not convinced by the analysis presented by AusNet of the benefits of the Early Fault Detection program. We consider that the analysis does not justify the proposed capex or opex step change.

30. The absence of documentation that explains and supports the modelling approach and tests the sensitivities of the outcomes is a weakness of the proposal.

### REFCL compliance program is justified but the cost is overstated

31. We consider that the proposal to address requirements at four sites as part of AusNet's proposed REFCL compliance program is reasonable.

32. We consider that the forecasting process applied by AusNet is reasonable, the solutions reflect a reasonable estimate of its requirements and AusNet has taken reasonable steps to defer the augmentation. However, we consider the application of the risk allowance and additional costs contributes to a higher than efficient cost.

### Connection enablement program

33. AusNet has presented four speculative programs on the assumption that the current pipeline of renewable energy generator connection enquiries will lead to sufficient actual projects if AusNet's 66kV network was to be augmented in order to be able to provide increased unconstrained access. AusNet states that the benefit to consumers would be from lower overall generation costs and emissions from facilitating connection and displacing fossil-fuel generation/emissions.

34. Two of the four projects have passed the RIT-D/RIT-T process and are essentially underway with completion scheduled for 2027. These projects do have the highest likelihood of generating the expected benefits, but this will take many years.

35. Whilst AusNet has developed sophisticated modelling of market benefits drawing off AEMO's PLEXOS model, the results of its analysis are extremely sensitive to the generation capacity that actually connects in the areas to which AusNet proposes building unconstrained network capacity.

36. Whilst we consider that the MWTS Stage 1 project is reasonably justified, we do not consider that the expenditure for the other three projects is sufficiently justified. The three projects are positioned to add network capacity in areas which provide reasonable

prospects of generators connecting sometime in the future because of the wind and energy resources. However, in our opinion and based on the information provided by AusNet, the project pipeline is not yet strong enough. Without further evidence of sufficient firm generator project status to underpin the economic analysis and proposed investment, we consider these projects to be speculative

### Based on AusNet's demand forecast, the majority of demand-driven projects and programs (other than CER and electrification) are justified, though their cost is overstated

37. In the majority of the projects we reviewed we were satisfied that there was a compelling case for AusNet to consider means of mitigating risk of unserved energy with increasing demand, that the selected solutions were prudent, and that the optimal timing is in the next RCP. However, the cost estimates were higher than an efficient level due primarily to the inclusion of risk allowances.

38. In two of the three proposed feeder augmentation projects that we reviewed, we consider that non-network solutions are likely to enable prudent deferment of the proposed new feeders.

## Assessment of proposed CER

### Voltage compliance augex

39. We consider that a supply improvement program similar to what AusNet has proposed is justified, however we consider that AusNet has overstated what would be a reasonable allowance for such a program.

40. AusNet has also proposed a large proactive program that would represent a significant uplift in its voltage compliance expenditure. AusNet has sought to justify this as an economic initiative; however, we consider that it has not justified, and has significantly overstated, key input assumptions that drive its forecast of the economic benefits of the program. Because of this, we consider that AusNet has not justified this uplift program.

### LV Augex (Electrification and flexible services)

41. AusNet has proposed a major augex program, and which it has already commenced, on the basis that this is an economically justified initiative to address anticipated impacts from electrification.

42. We are unable to reconcile key CBA assumptions with respect to expected unserved energy (EUE) in the next RCP with recently recorded unserved energy from overloaded DSS, and which we consider renders AusNet's CBA analysis as unreliable and not sufficient to support AusNet's proposed significant improvement program expenditure. Further, we consider that AusNet has not justified, and has significantly overstated, the economic cost of undervoltage supply. We therefore consider that AusNet has significantly overstated the extent to which its proposed LV augex program is economically justifiable in responding to the impact of electrification and accordingly that AusNet has not justified undertaking this program.

43. AusNet has also proposed an opex step change as a proposed payment to customers to adopt flexible services. We consider that this is not justified as AusNet has based this on an assumption that it will need to make cash payments to customers to adopt flexible imports, rather than identifying other means to enrol them.

### DSO / Future service provider hub

44. While we consider that it is justified to develop ICT capability to offer a full rollout of flexible exports, as AusNet proposes to do from 2027, we consider that AusNet's proposed DSO hub includes significant and costly functionality that AusNet has not justified. Because of this, we consider that its proposed ICT capex of $40.8 million for a DSO Hub is significantly overstated and is not justified by AusNet's claimed economic analysis.

45. We consider that AusNet's proposed opex step change for its DSO hub is a reasonable estimate of the additional expenditure that it will need to incur to introduce flexible exports.

## Assessment of proposed opex step changes for pole inspection, early fault detection and hazard tree management

### Proposed opex for pole inspections is a reasonable estimate

46. We are satisfied that the opex step change that AusNet has proposed for poles inspection represents a reasonable estimate of additional expenditure that AusNet will need to incur.

47. We are satisfied that the adjusted opex step change amount of $6.2 million that AusNet has proposed represents an efficient cost, that is not included in the base year or growth trend of the opex forecast. AusNet has taken steps to minimise the cost and has separately absorbed other costs relating to management of its pole population.

### AusNet has not sufficiently justified proposed opex, including the capex-opex trade-off, for the remaining two technical opex step changes within our scope

48. We are not satisfied that the opex step changes proposed by AusNet for hazard tree and early fault detection are justified. Specifically,

- Early fault detection – we consider that the program is not well justified, lacks sufficient demonstration of the benefits due to the emerging nature of the proposed technology, and therefore does not present an efficient capex-opex trade off.
- Hazard tree program - we do not consider that sufficient benefits arise from the proposed program as AusNet has claimed and therefore it does not present efficient expenditure.

# Implications for expenditure allowances

## Our approach

49. We were asked to consider an alternate expenditure forecast for the projects and programs that we reviewed based on the issues that we identified. Where a project was reasonably justified in accordance with the NER, we include this in our alternate expenditure forecast. In other cases, our proposed alternative expenditure forecast for the categories of expenditure we were asked to review involves one or more adjustments, to the extent to which we consider AusNet's forecast to be not justified and/or to be overstated.

50. Since the scope of our review did not in all cases comprise all projects within a 'category' of proposed expenditure, our alternative forecasts necessarily apply only to the aggregate of the projects within the scope of our review. Our assessment of an alternate expenditure forecast is intended to assist the AER in its own analysis of the proposed expenditures allowance as an input to its Draft Determination on revenue requirements for the next RCP.

51. To the extent we found evidence of systemic issues in its application of governance, management and forecasting issues to the projects and programs that we reviewed, we have taken account of these in our proposed alternate forecast.

## Alternative forecast for reviewed projects

### AusNet's proposed forecast for the repex projects that we reviewed is higher than a prudent and efficient level

52. We consider that a reasonable alternative forecast for the repex categories that we reviewed would be between 35% and 40% less than AusNet has proposed.

### AusNet's proposed forecast for the augex projects that we reviewed is higher than a prudent and efficient level

53. We consider that a reasonable alternative forecast for the augex categories that we reviewed (excluding CER augex) would be between 40% and 50% less than AusNet has proposed.

### AusNet's proposed forecast for CER augex, CER-related ICT and associated CER-related opex step changes, are higher than a prudent and efficient level

54. We consider that a reasonable alternative forecast for the two CER-related augex programs that we were asked to review, totalling $173.8 million, would be around 5% of this amount. We note that AusNet has also proposed a CER enablement program at a cost of $40.4 million but which was not within our review scope and has referred to a summer/winter readiness program at a proposed cost of $6.0 million, also not within our scope, as part of its wider suite of CER-related augex programs.

55. We consider that AusNet's proposed ICT capex of $40.8 million is overstated and that a reasonable alternative forecast for this would be around 30% to 40% less than AusNet has proposed.

56. We consider that AusNet's proposed ICT opex associated with its DSO Hub is reasonable and additional to current expenditure, and we take account of this in proposing an alternative estimate for its proposed 'digital' opex step change.[5]

57. We consider that AusNet's proposed opex step change of $8.5 million for Flexible services and non-network solutions is not justified.

### AusNet's proposed forecast for the three technical opex step changes that we reviewed, is in aggregate higher than a prudent and efficient level

58. We are satisfied that AusNet has justified the need for additional opex for pole inspection and that the adjusted costs of $6.2 million included by AusNet are necessarily prudent and efficient.

59. We are not satisfied that AusNet has justified the need for an opex step change for its proposed Early fault detection or its proposed Hazard tree program, or that the proposed costs are necessarily prudent and efficient.

[5] Please refer to our report on AusNet ICT

# 1 INTRODUCTION

The AER has asked us to review and provide advice on aspects of AusNet's proposed expenditures over the 2026-31 Regulatory Control Period (next RCP) relating to replacement expenditures (repex), augmentation expenditures (augex), consumer energy resources (CER) expenditures, and operating expenditures related to pole inspection, early fault detection and hazard tree reduction. Our review is based on information that AusNet provided and on aspects of the NER relevant to assessment of expenditure allowances.

## 1.1 Purpose of this report

60. The purpose of this report is to provide the AER with a technical review of aspects of the expenditure that AusNet has proposed in its regulatory proposal (RP) for next regulatory control period (RCP).

61. The assessment contained in this report is intended to assist the AER in its own analysis of the proposed expenditures allowance as an input to its Draft Determination on AusNet's revenue requirements for the next RCP.

## 1.2 Scope of requested work

62. Our scope of work, covered by this report, is as defined by the AER. Relevant aspects of this are as summarised in Figure 1.1.

*Figure 1.1: Scope of work covered by this report*

**Scope of work covered by this report**

The scope of this review, as requested by the AER, covers the following.

- Capex (ex ante)
  - Repex (selected projects)
  - Augex (selected projects)
  - CER-related (selected augex projects and an ICT project)
- Opex step changes
  - CER-related (including Digital and Flexible and Non-network Services)
  - Pole inspection
  - Early fault detection
  - Hazard tree program

63. Other aspects of AusNet's expenditures, including ICT and cybersecurity, are covered in a separate report.

## 1.3 Our review approach

### 1.3.1 Approach overview

64. In conducting this review, we first reviewed the RP documents that AusNet has submitted to the AER. This includes a range of appendices and attachments to AusNet's RP and certain Excel models which are relevant to our scope.

65. We next collated several information requests. The AER combined these with information request topics from its own review and sent these to AusNet.

66. In conjunction with AER staff, our review team met with AusNet at its offices on 2 – 4 April 2025. AusNet presented to our team on the scoped topics, and we had the opportunity to engage with AusNet to consolidate our understanding of its proposal.

67. AusNet provided the AER with responses to information requests and, where they added relevant information, these responses are referenced within this review.

68. We have subjected the findings presented in this report to our peer review and Quality Assurance processes and we presented summaries of our findings to the AER prior to finalising this report.

### 1.3.2 Conformance with NER requirements

69. In undertaking our review, we have been cognisant of the relevant aspects of the NER under which the AER is required to make its determination and relevant AER Guidelines.

#### Capex Objectives and Criteria

70. The most relevant aspects of the NER in this regard are the 'capital expenditure criteria' and the 'capital expenditure objectives.' Specifically, the AER must accept the Network Service Provider's (NSP) capex proposal if it is satisfied that the capex proposal reasonably reflects the capital expenditure criteria, which in turn reference the capital expenditure objectives.

71. The NER's capital expenditure criteria and capital expenditure objectives are reproduced in Figure 1.2 and Figure 1.3.

*Figure 1.2: NER capital expenditure criteria*

**NER capital expenditure criteria**

The *AER* must:

*(1) subject to subparagraph (c)(2), accept the forecast of required capital expenditure of a Distribution Network Service Provider that is included in a building block proposal if the AER is satisfied that the total of the forecast capital expenditure for the regulatory control period reasonably reflects each of the following (**the capital expenditure criteria**):*

*(i) the efficient costs of achieving the capital expenditure objectives;*

*(ii) the costs that a prudent operator would require to achieve the capital expenditure objectives; and*

*(iii) a realistic expectation of the demand forecast, cost inputs and other relevant inputs required to achieve the capital expenditure objectives*

*Source: NER 6.5.7(c) Forecast capital expenditure, v230*

*Figure 1.3: NER capital expenditure objectives*

***NER capital expenditure objectives***

*(a) A building block proposal must include the total forecast capital expenditure for the relevant regulatory control period which the Distribution Network Service Provider considers is required in order to do each of the following **(the capital expenditure objectives)**:*

*(1) meet or manage the expected demand for standard control services over that period;*

*(2) comply with all applicable regulatory obligations or requirements associated with the provision of standard control services;*

*(3) to the extent that there is no applicable regulatory obligation or requirement in relation to:*

*(i) the quality, reliability or security of supply of standard control services; or*

*(ii) the reliability or security of the distribution system through the supply of standard control services,*

*to the relevant extent:*

*(iii) maintain the quality, reliability and security of supply of standard control services; and*

*(iv) maintain the reliability and security of the distribution system through the supply of standard control services;*

*(4) maintain the safety of the distribution system through the supply of standard control services; and*

*(5) contribute to achieving emissions reduction targets through the supply of standard control services.*

*Source: NER 6.5.7(a) Forecast capital expenditure, v230*

### Opex Objectives and Criteria

72. The most relevant aspects of the NER in this regard are the 'operating expenditure criteria' and the 'operating expenditure objectives.' The NER's opex criteria and opex objectives are reproduced below.

*Figure 1.4: NER operating expenditure criteria*

**NER operating expenditure criteria**

*(c) The AER must accept the forecast of required operating expenditure of a Distribution Network Service Provider that is included in a building block proposal if the AER is satisfied that the total of the forecast operating expenditure for the regulatory control period reasonably reflects each of the following (**the operating expenditure criteria**):*

*(1) the efficient costs of achieving the operating expenditure objectives;*

*(2) the costs that a prudent operator would require to achieve the operating expenditure objectives; and*

*(3) a realistic expectation of the demand forecast, cost inputs and other relevant inputs required to achieve the operating expenditure objectives.*

*Source: NER 6.5.6(c) Forecast operating expenditure, v230*

*Figure 1.5: NER operating expenditure objectives*

**NER operating expenditure objectives**

*(a) A building block proposal must include the total forecast operating expenditure for the relevant regulatory control period which the Distribution Network Service Provider considers is required in order to do each of the following (**the operating expenditure objectives**):*

*(1) meet or manage the expected demand for standard control services over that period;*

*(2) comply with all applicable regulatory obligations or requirements associated with the provision of standard control services;*

*(3) to the extent that there is no applicable regulatory obligation or requirement in relation to:*

*(i) the quality, reliability or security of supply of standard control services; or*

*(ii) the reliability or security of the distribution system through the supply of standard control services,*

*to the relevant extent:*

*(iii) maintain the quality, reliability and security of supply of standard control services; and*

*(iv) maintain the reliability and security of the distribution system through the supply of standard control services; and*

*(4) maintain the safety of the distribution system through the supply of standard control services; and*

*(5) contribute to achieving emissions reduction targets through the supply of standard control services.*

*Source: NER 6.5.6(a) Forecast operating expenditure, v230*

### How we have interpreted the capex and opex criteria and objectives in our assessment

73. We have taken particular note of the following aspects of the capex and opex criteria and objectives:

- Drawing on the wording of the first and second criteria, our findings refer to efficient and prudent expenditure. We interpret this as encompassing the extent to which the need for a project or program or opex item has been prudently established and the extent to which the proposed solution can be considered to be an appropriately justified and efficient means for meeting that need
- The criteria require that the forecast '*reasonably reflects*' the expenditure criteria and in the third criterion, we note the wording of a '*realistic expectation*' (emphasis added). In our review we have sought to allow for a margin as to what is considered reasonable and realistic, and we have formulated negative findings where we consider that a particular aspect is outside of those bounds
- We note the wording '*meet or manage*' in the first objective (emphasis added), encompassing the need for the NSP to show that it has properly considered demand management and non-network options
- We tend towards a strict interpretation of compliance (under the second objective), with the onus on the NSP to evidence specific compliance requirements rather than to infer them, and
- We note the word '*maintain*' in objectives 3 and 4 and, accordingly, we have sought evidence that the NSP has demonstrated that it has properly assessed the proposed

expenditure as being required to reasonably maintain, as opposed to enhancing or diminishing, the aspects referred to in those objectives.

74. The DNSPs subject to our review have applied a Base Step Trend approach in forecasting their aggregate opex requirements. Since our review scope encompasses only proposed expenditure for certain purposes, we have sought to identify where the DNSP has proposed an opex step change that is relevant to a component that we have been asked to review. Where the DNSP has not proposed a relevant opex step change, then we assume that any opex referred to in documentation that the DNSP has provided is effectively absorbed and need not be considered in our assessment.

### 1.3.3 Technical review

75. Our assessments comprise a technical review. While we are aware of stakeholder inputs on aspects of what AusNet has proposed, our technical assessment framework is based on engineering considerations and economics.

76. We have sought to assess AusNet's expenditure proposal based on AusNet's analysis and AusNet's own assessment of technical requirements and economics and the analysis that it has provided to support its proposal. Our findings are therefore based on this supporting information and, to the extent that AusNet may subsequently provide additional information or a varied proposal, our assessment may differ from the findings presented in the current report.

77. We have been provided with a range of reports, internal documents, responses to information requests and modelling in support of what AusNet has proposed and our assessment takes account of this range of information provided. To the extent that we found discrepancies in this information, our default position is to revert to AusNet's RP documents as provided on its submission date, as the 'source of record' in respect of what we have assessed.

## 1.4 This report

### 1.4.1 Report structure

78. In section 2 we provide our observations on AusNet's application of its governance framework and forecasting methodology to the expenditure category, along with the derived forecasting inputs.

79. In each subsequent assessment section 3 to 6 inclusive, we have presented we have presented our assessments for projects within our scope, respectively for:

- Proposed repex categories/projects
- Proposed augex projects (other than for CER)
- Proposed CER-related projects
- Proposed technical opex step changes.

80. In each of these assessment sections we include:

- An overview of the proposed expenditure and a summary of AusNet's justification for that expenditure
- Our assessment of individual expenditure categories and/or projects, and
- Our findings for each expenditure category and the implications of these findings for the expenditure allowances to be determined by the AER in its Draft Determination.

81. We also provide the following appendices:

- Appendix A – AusNet's economic modelling issues specific to its proposed LV electrification network augmentation program

- Appendix B - Economic assessment methodology issues, and
- Appendix C – AusNet's historical performance.

82. We have taken as read the considerable volume of material and analysis that AusNet provided, and we have not sought to replicate this in our report except where we consider it to be directly relevant to our findings.

### 1.4.2 Information sources

83. We have examined relevant documents that AusNet has published and/or provided to the AER in support of the areas of focus and projects that the AER has designated for review. This included further information at onsite meetings and further documents provided in response to our information requests. These documents are referenced directly where they are relevant to our findings.

84. Except where specifically noted, this report was prepared based on information provided by AER staff prior to 1 June 2025 and any information provided subsequent to this time may not have been taken into account.

85. Unless otherwise stated, documents that we reference in this report are AusNet documents comprising its RP and including the various appendices and annexures to that proposal.

86. We also reference responses to information requests, using the format IRXX QYY being the reference numbering applied by the AER to IRs and to specific Question numbers within the IR. Noting the wider scope of the AER's determination, the AER has provided us with IR documents that it considered to be relevant to our review.

### 1.4.3 Presentation of expenditure amounts

87. Expenditure is presented in this report in $2025-26 real terms and includes real cost escalation, unless stated otherwise. In some cases, we have converted to this basis from information provided by the business in other terms.

88. While we have endeavoured to reconcile expenditure amounts presented in this report to source information, in some cases there may be discrepancies in source information provided to us and minor differences due to rounding. Any such discrepancies do not affect our findings.

# 2 REVIEW OF GOVERNANCE, MANAGEMENT AND FORECASTING METHODS

The focus of our assessment has been on the material changes to the governance and forecasting methods applied by AusNet in its determination of its expenditure requirements for the next RCP. Specifically, whether the changes made by AusNet are likely to have led to a higher or lower estimate of expenditure than would otherwise have been the case, for those items of expenditure we have been asked to review.

The extent to which the expenditure forecast requirements meet NER requirements is, in part, dependent on how its investment governance and management framework has been applied.

## 2.1 Introduction

89. In this section we provide some context from the historical performance of AusNet and make observations relating to the service performance and expenditure performance leading into the next RCP.

90. We then consider the materials provided by AusNet and how they align with the requirements as defined in the AER guidance materials. The extent to which we have a complete set of information to undertake our assessment is critical to a determination that the proposed expenditure is prudent and efficient.

91. We next consider whether AusNet has made any material changes to its governance arrangements during the current RCP, that have impacted its investment decision making and impacted either the nature or completeness of the information available to us. Following this we consider the governance, management and forecasting methods applied to the development of expenditure requirements for the next RCP, and whether these are likely to have led to a prudent and efficient forecast of requirements.

92. Our assessment of the governance, management and forecasting methods is not intended to be a comprehensive review, nor does it purport to represent all methods that AusNet has applied for the next RCP. Rather we focus primarily on matters which we consider impact the forecast expenditure requirements, detailed in the subsequent sections of this report.

## 2.2 Background and context

### 2.2.1 Summary

93. Common to our review of Victorian DNSPs, AusNet's expenditure incurred during the current RCP has differed from the allowance. Common drivers are delays to the onset of demand compared with the forecast prepared at the time of the previous determination and also uplifts in the price of goods and services incurred during the current period. We comment on key reasons for the changes in expenditure profile and composition of the projects and programs that make up the expenditure profile in our assessment of the corresponding expenditure.

94. For the next RCP, Victorian DNSPs like other NSPs across the NEM are responding to macro-economic changes including transformation of the electricity system including

electrification of gas[6] and transport.[7] In Victoria there are specific policy settings that impact demand and are embedded into the demand forecasts that each of the NSPs have relied upon. By agreement with the AER, a separate review of the demand forecast is being undertaken by the AER. For this review, we rely on the demand forecast and assumptions prepared by, and submitted with, the DNSP regulatory proposal.

95. In Appendix C we provide a summary of the historical trends in service delivery and expenditure as context for our review. The trends are based on published materials from the AER and ESV, which apply to each DNSP that we have been asked to review.

96. We have not been asked to consider the broader performance for each DNSP or take account of all factors that may be contributing to the service of expenditure performance indicated by these trends. We also recognise that the measures applied by the AER and ESV are not comprehensive or exhaustive, but act as context for our assessment of specific projects and programs.

### 2.2.2 General observations relating to service performance

97. We observe that AusNet's network performance has generally been improving, along with asset performance despite the impact of several major weather events across Victoria. For AusNet's network:

- Average reliability performance is generally improving, with decreasing frequency of outages with more current information suggesting an upward trend in unplanned SAIFI due to asset failure related SAIFI
- AusNet has experienced some of its worst outage events on record, caused by extreme weather contributing to an increase in the number of cost pass through applications for the increased costs associated with natural disasters
- Despite improvement in 2021-22, the rate of line clearance non-compliance has declined and is at its highest level including being above the average of all DNSPs, and
- Network utilisation shows a slight increasing trend over the last 10 years and remains higher than the DNSP average.

### 2.2.3 General observations relating to expenditure performance

98. We observe that AusNet's actual expenditure has historically tracked lower than the forecast expenditure. Issues such as increasing labour and material costs, and deferral of works that occurred during the current RCP also have implications for the forecast in the next RCP, and we consider the implications in the projects and programs that we have reviewed. For AusNet's network:

- Capex delivery performance is subject to a range of factors, with actual capex tracking more closely to forecast capex recently
- Despite this trend, AusNet expects to overspend the capex allowance, and
- Over the last 5 years, actual opex is lower than forecast opex resulting in a material underspend against the opex allowance.

## 2.3 Presentation of submission information

99. In this section we consider the degree to which AusNet has adhered to the expenditure assessment guidelines.

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6 In 2022, the Victorian Government published its Gas Substitution Roadmap that outlined the pathway to transition away from residential gas in Victoria, with the first key step being the ban on new residential gas connections from January 2024

7 The Victorian Government is committed to decarbonizing its road transport sector with the goal of achieving net-zero emissions by 2045

### 2.3.1 AER guidance on expectations

100. Drawing on the relevant parts of the Rules as detailed in section 1, and the guidance materials published by the AER, the AER has outlined 4 expectations of a network business' capital expenditure proposals in the Better Resets Handbook. These are:

1. Top-down testing of the total capital expenditure forecast and at the category level
2. Evidence of prudent and efficient decision-making on key projects and programs
3. Evidence of alignment with asset and risk management standards
4. Genuine consumer engagement on capital expenditure proposals

101. In our review, we have regard to the first three of these expectations as they apply to the scope of our review and which target categories or sub-categories of capex. More specifically, expectation 2 includes demonstration of prudency and efficiency in its decision-making by

- Identification and evidence of the network's need
- Quantitative cost benefit analysis, and
- Where relevant, evidence of fully accounted for trade-offs.

102. These expectations are also accompanied by a range of guidelines to assist DNSPs, including the expenditure forecast assessment guidelines. With regard to the capital expenditure assessment approach, the expenditure forecast assessment guidelines emphasise the need for economic justification of the proposed expenditure:

> *'Where businesses do not provide sufficient economic justification for their proposed expenditure, we will determine what we consider to be the efficient and prudent level of forecast capex. In assessing forecasts and determining what we consider to be efficient and prudent forecasts we may use a variety of analysis techniques to reach our views.'*[8]

103. When considered together, and also drawing from relevant parts of other AER guidelines,[9] we interpret this to mean that the AER places material weight on demonstration of economic analysis to support the proposed expenditure. We have therefore sought evidence of the economic justification in our assessment.

### 2.3.2 AER guidance on information that is expected to support the regulatory proposal

104. This is further supported by the summary of information that is expected to accompany the regulatory proposal, whereby the guidelines state:

> *'We will require a range of data to support our assessment of total forecast capex. We expect DNSPs to submit regulatory proposals that include:*
>
> – *economic analysis demonstrating the forecast expenditure is prudent and efficient. This should include documentation and underlying data sufficient to support the economic analysis*
>
> – *reasons for costs for given expenditure categories and types of work differing from their historical expenditure, and*
>
> – *explanations of trade-offs between capex and opex expenditure that show that the choices chosen (for example to undertake a capex IT program to reduce opex) are prudent and efficient. Firms will also need to demonstrate these choices are fully accounted for in capex and opex forecasts.'*[10]

8 AER Expenditure forecast assessment guidelines – Electricity distribution – October 2024

9 Including the asset replacement guidelines

10 AER Expenditure forecast assessment guidelines – Electricity distribution – October 2024

### 2.3.3 Summary of information provided for its capex forecast

105. In terms of the scope of our review, we summarise the information that has been provided to support the forecast expenditure

#### Reconciliation of data

106. We had difficulty reconciling the list of projects included in the Regulatory Proposal, with those included in the Capex model *ASD – AusNet EDPR 226-31 – SCS Capex Model* and also the Reset RIN.

107. Whilst the top-level capex numbers did reconcile and by capex category, the apportionment between programs, AusNet's project categories and finally RIN was not clear to us. We have in prior reviews received from the business a worksheet that provides multiple views of the capex data, and which we consider AusNet would have had in the preparation of its regulatory submission. However, no such document was made available to us.

108. We understand that capex amounts referred to in the capex chapter are expressed in real $2023-24 and are also input to the capex model in the same dollar terms. However, these values do not align as AusNet has also added contractor support costs (totalling $77M), which have been included in these inputs via apportionment to individual projects and programs, and which are in addition to the amounts shown in the models and the regulatory proposal.

#### Supporting justification for its repex forecast

109. In its Expenditure forecasting methodology,[11] AusNet refer to the development of business case, NPV analysis and options analysis. We asked AusNet to provide the business case and model(s) to show the development of the proposed repex for each asset class, that reconcile with the proposed replacement volume and capex forecast.

110. We were not provided with any business cases but rather directed back to the AMS documents provided with its proposal. We found the lack of business case documents, which we had expected to exist as is consistent with an expenditure governance framework, challenging for our review. In some cases, we had difficulty understanding the basis for AusNet's proposed scope/volume of replacement, timing and efficiency of the proposed capex. We detail this in our review of the respective components of the proposed expenditure.

#### Challenge in determining the basis of the forecast replacement volume from regulatory submission

111. The materials provided with AusNet's submission did not allow us as technical reviewers to determine the basis for how AusNet had established a forecast replacement volume that met the requirements of the rules.

- Following our review of the submission materials, we asked for the provision of all working models that AusNet had relied upon in developing the expenditure forecast. In response AusNet directed us to the models provided with the submission.
- We further discussed this during our onsite meeting. AusNet acknowledged the request, including that the pole model provided was incorrect.
- Following the onsite we again requested the models, with reference to meeting the requirements of the Better Handbook and expenditure assessment guideline.

112. This was further complicated by application of top-down adjustments to the outcome of its modelling and application of smoothing across the regulatory period. The application of these adjustments was not transparent. We therefore asked for demonstration of how these adjustments had been applied.

113. For some projects no modelling was provided.

[11] section 10.11

114. In cases where modelling was provided, the documentation at times did not refer directly to the models. In some cases, the volumes and expenditure did not match, and it was difficult to understand the steps that AusNet had undertaken to demonstrate the forecast was prudent and efficient. For distribution line programs, this was hindered by modelling being undertaken in proprietary software and in these cases, AusNet generated models aimed at replicating the results in excel for our review.

115. We asked for additional information, and clarification of our understanding during an onsite meeting and two rounds of information requests, effectively providing three opportunities to present the case for the proposed expenditure. In many cases, the additional information provided included additional models (e.g. the post model adjustments were not previously provided at a program level) and assisted use form our view of the proposed expenditure. We refer to this additional information throughout our assessment.

116. For some items of expenditure, the information provided fell short of that required to reasonably demonstrate that the proposed expenditure was prudent and efficient.

#### Changes to the submission

117. We have based our assessment on the regulatory proposal (initial proposal). Where AusNet Services has proposed to change the expenditure included in the submission from its initial proposal in its response to our request for information, we have made note of this in our assessment.

## 2.4 Assessment of matters relating to the governance arrangements and forecasting methods applied for the next RCP

118. Consistent with the overarching purpose, we focus primarily on matters which we consider impact the forecast expenditure requirements, detailed in the subsequent sections of this report.

### 2.4.1 Summary of material changes to the governance arrangements in the current RCP

119. Given our focus on expenditure, we looked for key changes to the investment governance arrangements that AusNet had applied or will apply that may impact the prudent and efficient expenditure requirements for the next RCP.

120. Based on our reading of the final determination for the current period, we did not ascertain any systemic issues identified by the AER at that time, that we would need to review.

121. In the context of the investment governance framework, investment planning, forecasting methods and risk management approaches ('governance methods'), we provided an opportunity for AusNet to detail any changes to the governance methods applied by AusNet during the current period, and that impact the development of the expenditure forecast for the next period.

122. In its response, AusNet stated that:

> *'There have been no significant changes to our investment governance framework, investment planning and risk management approaches during the current period that have impacted the development of the expenditure forecast for the next period.'*[12]

123. Specifically with regards to the forecasting methods, AusNet stated that the forecasting methods remain largely consistent with those applied to forecast our current period capex requirements.

[12] AusNet response to IR009, Question 1

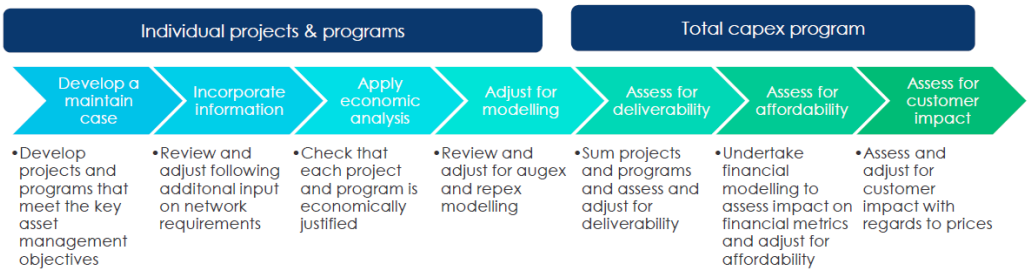
124. However, AusNet added that it had developed new forecasting methods for its new investment drivers that were not applied to forecast our expenditure allowance for the current period. This includes resilience, large renewables enablement, addressing worst served customer reliability and regional reliability allowance (RRA), and distribution system operator (DSO). Where relevant, we make comments on these in our review of the associated expenditure.

### 2.4.2 Top-down review and portfolio optimisation

#### AusNet describe a robust, bottom-up network forecasting process to develop its capex forecast

125. A summary of AusNet's forecasting process is provided in Figure 2.1.

*Figure 2.1: Summary of AusNet's forecasting process*




*Source: AusNet - Expenditure forecasting methodology 2026-31 - June 2024, Figure 9*

126. We did not see sufficient demonstration of the assessment methods described by AusNet in this process across the total capex program. We had expected that AusNet would provide greater analysis of the impact on varying expenditure levels to service outcomes in the context of:

- Capital expenditure that is exceeding the current allowance and will increase due to higher costs, demand growth and new drivers, and
- A proposal for $3.5 billion net capex, representing a 72% overall increase.

127. For example, this may include the consideration of different expenditure scenarios against service outcomes such as risk, or other performance measures. We have not seen demonstration of this.

#### Summary of measures taken by AusNet to reduce, remove and defer expenditure to a later RCP reasonably reflect the process that AusNet has described

128. AusNet describes a number of 'affordability measures' in its Regulatory Proposal (Table 0-1), including the removal, reduction and deferral of expenditure from the next RCP totalling $200m. We asked AusNet to explain how each of the affordability measures had been made relative to the expenditure included in the business case and capex model *ASD – AusNet EDPR 226-31 – SCS Capex Model*.

129. We are satisfied that the values quoted by AusNet reasonably reflect the process that AusNet has described.

#### AusNet has applied a top-down adjustment to its proposed repex and augex

130. AusNet recognises that there is scope for overlap and synergies between programs within its capex proposal. Accordingly, it has calculated the total value of overlaps and removed these from its capex proposal. This is recorded in its Top Down adjustment supporting document.[13]

[13] ASD - AusNet - Top Down Adjustment - 31 Jan 2025 - PUBLIC

131. The total top-down adjustment was $42 million and is summarised in Table 2.1. We have taken account of the relevant adjustments in our assessment of the proposed repex and augex.

*Table 2.1: Summary of top-down adjustments, $ millions*[14]

| Project name | Cells of capex model | Direct capex would have been higher by | Category of top down adjustment |
|---|---|---|---|
| Poles repex | K30:K33 | 8.50 | Repex and future programs at a total of $14.2 million |
| Insulators repex | K57:O57 | 0.45 | |
| Cross arms repex | K35:O36 | 2.39 | |
| DTs repex | K45:O46 | 0.56 | |
| Conductors repex | K38:O43 | 2.12 | |
| Service repex | K47:O47 | 0.13 | |
| Thomastown ZSS rebuild | K11:O11 | 13.05 | Repex and zone substation rebuilding at a total of $24.05 million[15] |
| Watsonia ZSS rebuild | K10:O10 | 2.08 | |
| Traralgon ZSS rebuild | K12:O12 | 4.97 | |
| Newmerella ZSS rebuild | K13:O13 | 1.68 | |
| Kilmore South ZSS rebuild | K14:O14 | 2.27 | |
| LV electrification | K106:O106 | 3.77 | DSS upgrades at a total of $3.77 million[16] |
| **Total** | | **42.02** | |

*Source: AusNet's response to IR09 Question 3*

### AusNet has made further adjustments to the economic timing of projects as a part of resource smoothing / deliverability assessment

132. In addition, AusNet advised that it deferred several augmentation projects beyond their economic timing to smooth the ramp up in its capital program during the next RP and to further mitigate potential delivery risks.

133. The deferred projects have reduced its proposed revenue requirement and improved the affordability of its plans:[17]

- REFCL compliance program
- Morwell Terminal Station (MWTS) South 66kV loop: MWTS-LGA lines upgrade
- Eastern Cranbourne 66kV loop augmentation
- New transformer at Wonthaggi
- New 22kV distribution feeders (WOTS21, SMR11 and WGL31), and
- The regional reliability allowance.

14 We assume this is on the same dollar basis as the capex model

15 Corrected from $24.5 million included in IR09

16 This figure was not included in the IR response, and was taken from the Top-down adjustment document which correctly totals to $42 million

17 AusNet's regulatory proposal, page 112

134. We have taken account of the deferred project timing of relevant projects in our assessment of the proposed repex and augex.

## 2.4.3 Activity forecasting methods

### Repex activity forecasting

135. AusNet has used a combination of forecasting methods for its repex requirements, including fault and inspection/defect-based replacement using historical trend, risk-based replacement making use of its quantified risk cost modelling and economic analysis.

136. AusNet had separated its modelling into inspection-based and risk-based, with most of the distribution lines expenditure aligning with the inspection-based method. These did not include economic analysis, assessment of options or sensitivity analysis.

### Augex activity forecasting

137. Augex is typically forecast using bottom-up methods and responds to specific drivers which may vary from one regulatory period to another. In broad terms the drivers are:[18]

- Capacity constraints in the distribution network due to growth in maximum demand
- Power quality and voltage compliance, and
- Enabling additional consumer energy resources exports, where it is economic to do so.

#### Demand forecasts

138. AusNet (like other DNSPs) undertake probabilistic risk-cost analysis applying weighted demand forecasts based on 70% 50PoE and 30% 10PoE. We noted that AusNet's demand-driven programs (within our scope) are based on demand forecast using FY2023/24 peak demand. We asked for the 2024/25 peak demand data and, if available, the updated demand forecasts using the latest (weather-corrected) data. Our intention was to test the near-term demand forecast with the latest data as a reference point.

139. However, AusNet advised[19] that it had not yet prepared its 2024/25 demand forecasts and therefore it had not considered the effects of the 2024/25 demand forecast on the economic timing of its proposed projects.

140. AusNet did however note that the 2024/25 summer included several heat waves which resulted in constraints in several (unspecified) locations in the network and stated that on this basis, its peak demand forecasts for the next RCP may increase as a result.

141. Consequently, our assessment is based on the demand forecasts in the models provided with AusNet's submission. We apply a 100% 50PoE forecast as a defacto 'low case' sensitivity check on the economic timing of the proposed work to lower than expected demand at the target parts of the network.

#### Demand-driven augex and voltage compliance

142. AusNet describes its capital expenditure forecast methods for demand-driven augex in two parts:

- Excluding LV - in its Expenditure Forecasting Methodology document provided with its RP, with Table 2 providing a useful summary and which we consider is reflective of good practice, and
- For augmentation of the LV network – AusNet describes its forecasting methodology as part of a broader LV network modelling approach in which it forecasts expenditure for voltage management, demand driven augmentation (largely due to electrification of gas and transport) and enablement of exports from consumer energy resources (CER); we

[18] AusNet - Expenditure forecasting methodology 2026-31 - June 2024, page 14

[19] AusNet response to IR009, question 25

have significant issues with aspects of the methodology, as discussed in our assessment below.

#### Generation integration

143. AusNet describes its activity forecasting methodology for generation integration in two parts also:

- Large-scale generation enablement – AusNet has created a 'market model' leveraging off AEMO's ISP regional model to identify locations for network augmentation that will enable connection of prospective large-scale renewable generation; the objective is to enable emissions reduction and reliability benefits; due to the nature of the modelling, we explored the details at our on-site meeting with AusNet representatives to help confirm our understanding, and
- Small-scale consumer energy resources (CER) integration – AusNet's approach to forecasting CER and export enablement expenditure is aligned with the AER's distributed energy resources (DER) integration expenditure guidance note;[20] however, as identified above, we identified issues with AusNet's application of the methodology (which we discuss as part of our assessment, below).

#### Opex step change forecasting

144. AusNet has provided a bottom-up build of the opex step changes that we have been asked to review with reference to a proposed base year for its opex forecast of FY23.

### 2.4.4 Risk assessment and modelling

#### AusNet follows its risk assessment methodology for its risk-based programs, however a large part of its forecast repex relies on condition information

145. AusNet has provided its asset risk assessment methodology AMS 01-09-02 which describes the methodologies used by AusNet to determine the asset risk and the mitigating methods for regulated network assets. In addition, AusNet states that it maintains a risk management system designed in accordance with AS ISO 31000 Risk Management – Guidelines.

146. The risk cost is determined as the combination of the probability of failure and cost of consequence from the failure, comprising: Safety, Environment, and Customer/reputation consequences. These are determined using reasonable factors and drawing from accepted sources of cost estimates for safety and bushfire cost.

147. Event tree analysis is the main technique employed to determine the Likelihood-of-Consequence (LoC) following an asset failure, recorded in AMS 01-09-02 Event trees. We asked AusNet for an explanation of a number of factors relied upon in the development of its LoC in its event tree analysis. We were satisfied with AusNet's response, that these factors are reasonable estimates.

148. In the event tree analysis, AusNet state that a full CoF model was not developed for Poles and Pole Top Structures as no proactive replacements were expected.

149. For repex projects, AusNet also state that it has:

> *'...applied industry standard risk-based approach consistently across asset classes to determine the optimal replacement timing based on factors such as Probability of Failure (PoF) and Cost of Consequence (CoC).*[21]

150. As noted above, AusNet's forecasting methods are separated into inspection based and risk based. We found that, following further enquiry of AusNet we were provide with economic

[20] AusNet - Expenditure forecasting methodology 2026-31 - June 2024, Figure 12

[21] RP page 108

models based on its quantitative risk analysis for the risk-based forecast. However, the inspection-based forecast primarily relied on condition information.

### 2.4.5 Economic assessment

#### Business cases were not provided for all proposed expenditure

151. The economic methods applied by AusNet are described in its risk assessment methodology, and forecasting methods as described earlier.

152. In addition, AusNet describes a process of establishing a business case and economic assessment for each of its project. We did not find evidence of business cases for all parts of the proposed expenditure, primarily repex. Instead, the expenditure was described in a combination of places including the regulatory proposal and models. For some programs, AusNet's asset management strategies included the proposed repex whereas for other repex projects and programs, the proposed replacement volume or expenditure was not included.

#### AusNet describes multiple methods to determine the economic timing

153. In its risk assessment methodology, AusNet describe its economic assessment based on risk monetisation as:

> *'The economic optimal time of replacing an asset is determined by either calculating the year when the Net Present Value (NPV) of asset risk cost and asset replacement cost is optimised over a 20-year period (section 6.2.1. , or finding the year in which the asset replacement cost becomes lower than the asset risk cost (section 6.2.2. ). Typically, maximising NPV is an appropriate method when considering a group of assets and NPV greater than zero for a single asset.'*[22]

154. We observe both methods being applied by AusNet.

#### Claimed justification for thousands of individually small interventions, based on a sub-optimal economic goal

155. Particularly for programs involving consideration of multiple individually small investments, typically at the LV level, AusNet (and other DNSPs) tend to develop models that 'test' potentially tens of thousands of potential interventions against an economic goal. If undertaken correctly, this is a valid approach. A typical circumstance is that an intervention is found to be uneconomic if undertaken in the early years but (due to increasing risk-costs of not undertaking the intervention) becomes economic if undertaken at some later time.

156. We found instances where the project timing (investment year) is nominated as being the first year when the PV of the future benefits exceeds the PV of the future costs, if the project was undertaken in that year. As we show in Appendix B, the initial positive net benefit indicates that this is the first year for which, if undertaken in that year, the intervention would have a positive economic value. However, this is typically only because, in testing the intervention against a goal of 'positive NPV' in successive years, this simply identifies the first year for which the forecast positive returns towards the end of the analysis period offset continuing negative returns in the short term.

157. A positive NPV is not an appropriate goal in itself and, as we show in Appendix B (and consistent with AER's 2019 guidance note on Asset Replacement), for an economic test the goal should be to find the first year for which the **annual benefits** exceed the **annuitised cost** of the intervention. This test also identifies the optimum timing for the intervention, being the timing that provides the highest NPV; in other words, deferring the intervention after this time would be less economic.

158. Project timing, and programs built on timing of individual projects when each potential intervention would first have a positive NPV or is determined using an understated

[22] ASD – AusNet – AMS 01-09 Asset Risk Assessment Methodology – 31 Jan 2025 – PUBLIC, page 18

annuitised cost, then the modelling will almost certainly be biased towards including such interventions prematurely and therefore over-estimating the extent to which such interventions are economically justified within the period.

159. The AER has published expenditure assessment guidance based on determining optimal timing using the annualised cost and annual risk/benefit, which if applied correctly should indicate timing that aligns with the point at which the NPV is maximised.

### VCR assumptions are based on AusNet's own analysis

160. In its regulatory proposal, AusNet describe the outcomes of its quantitative customer value (QCV) analysis and which it has used to determine the VCR for analysis of its expenditure requirements in the next RCP. The differences in VCR assumptions are shown in Figure 2.2.

*Figure 2.2: VCR comparisons (dollars per kWh)*

| | Residential | Agriculture | Commercial | Industrial |
|---|---|---|---|---|
| Our adopted approach – AusNet's combined approach based on combining our QCV for residential customers with the AER's 2023 VCRs for non-residential customers | 52.42 | 44.40 | 52.20 | 74.79 |
| AER's 2023 VCRs | 25.13 | 44.40 | 52.20 | 74.79 |
| AER's 2024 VCRs | 49.23 | 22.25 | 34.39 | 33.49 |
| AusNet's QCV | 52.42 | 32.01 | 32.01 | 32.01 |

*Source: AusNet regulatory proposal, table 6-5*

161. Whilst the assessment approaches for application of VCR differ across expenditure categories, the combined approach dominates, as shown in Table 2.2.

*Table 2.2: Summary of VCR assessment approach by AusNet*

| Capex | Summary of approach |
|---|---|
| Demand driven augex (LV augex): | Adopted the **combined approach** in central case assessment, with sensitivity testing at the AER's 2023 VCRs.<br>Using a combined QCV/AER's 2023 VCRs approach increased capex by approximately $15 million compared to using the AER's VCRs. |
| Demand driven augex (non-LV augex) and reliability programs: | Adopted the **AER's 2023 VCRs** in central case assessment, with sensitivity testing at combined QCV/AER's 2023 VCRs.<br>The economic outcomes (preferred option, capex requirement, opex requirement and optimal timing) for these projects remain the same under both scenarios i.e., the preferred option, capex and opex requirements, and optimal timings are the same whether the AER's 2023 VCRs or combined QCV/AER's 2023 VCRs approach are adopted. |
| Replacement: | Adopted the **combined approach** in central case assessment; with sensitivity testing at the AER's VCRs.<br>Using a combined QCV/AER's VCRs approach increased capex by approximately $50 million compared to using the AER's 2023 VCRs alone. |
| All others capex investments: | Adopted the **combined approach** in central case assessment; with sensitivity testing at the AER's VCRs. |

*Source: EMCa derived from regulatory proposal, section 6.4.4.3*

162. In appendix D of the risk assessment methodology AusNet has provided a list of VCR values by zone substation, expressed as $/kWh and which we understand have been applied in its assessment.

### Updating VCR may impact the economic timing of some projects

163. We understand that AusNet has applied a combination of its QCV data and the 2023 VCR values to its proposed projects as shown in Table 2.2, and not the AER's 2024 VCRs. We further understand that it is AusNet's intent to consider the implications of the new VCRs for the revised regulatory proposal.

164. Noting the increases to the capex by applying QCV relative to the previous VCR values, we asked AusNet to indicate whether it believes there will be material differences to the capex proposal. In its response, AusNet stated:

> *'We do not anticipate that applying AER 2024 VCRs in our revised regulatory proposal will have a material impact on our capex forecast. This is primarily because, for residential customers, the AER 2024 VCRs are similar to the QCV VCRs we applied to many of the projects and programs in our regulatory proposal. Where we applied AER 2023 VCRs, this approach was taken because QCV VCRs did not impact economically justified expenditure in 2026-31.*
>
> *While the AER's 2024 non-residential VCRs are lower than those we have applied, we do not expect this to materially impact our capex forecasts given the relatively low proportion of business customers on our network.'*[23]

165. We have reviewed the potential impact of changes to the VCR assumption on the proposed expenditure for the next RCP and note that many of the substation VCRs appear to reflect a higher value of VCR than may be derived from AER's most recent 2024 VCR study. We come to this view by application of the customer weightings that AusNet has applied, and when applied to the latest value of VCR by customer, result in reduction to the VCR assumption used in the economic analysis. In our assessment of the proposed expenditure, we consider that the timing for some projects is deferred beyond the end of the next RCP.

## 2.4.6 Cost estimation and cost forecasting

### AusNet has applied a standard cost estimation methodology

166. AusNet states that its cost estimates have been prepared as part of a standardised approach to developing, managing and reporting projects and programs of works, as documented in its Project Cost Estimating Methodology.

### Cost estimation accuracy and risk allowances overstate the expenditure requirements

167. We asked AusNet to confirm the estimate accuracy used as the basis of its Regulatory Proposal capex forecasts. For its discrete projects, AusNet stated that the majority are P50 cost estimates (also referred to as 'indicative' or 'budget' estimates).[24] AusNet also state that

> *'[T]these P50 cost estimates include a risk allowance, consistent with our approach to developing unbiased cost estimates in previous price reviews, which the AER has previously accepted.'*[25]

168. When asked for an example of 'indicate cost estimate', AusNet confirmed that the cost estimate includes a risk allowance equal to 5-10% of the total project costs.[26] We reviewed the rationale for, and approach to deriving, this risk allowance as explained in AusNet's Cost Estimation Methodology document. Whilst we see the potential for inclusion of a risk allowance to be included for complex discrete projects, if applied on a probability weighted basis, as contemplated in the cost estimation methodology. However, in the examples we

23 AusNet's response to IR009 Question 4

24 AusNet response to IR009, question 10

25 AusNet response to IR009, question 10

26 AusNet response to IR009, question 10

reviewed this was added as an overall margin or allowance, being a percentage of the total project cost of 8% on average.

169. Applied in this way, the costs are likely to overstate the required expenditure. We base this on the fact that the 'base' cost estimate is derived from historical expenditure for projects of similar scope and scale and which already contains costs for risks that have been realised for those projects, not all of which will be present in each project, and that there is a reasonable probability that some projects are lower or higher than the estimated costs when considered across the portfolio.

### Review of recent discrete projects indicates that actual costs are lower than cost estimates

170. We requested that AusNet include evidence of the estimation accuracy of a sample of projects delivered, and where available, any external reviews of the estimating accuracy of projects. previous projects.

171. Whilst AusNet did not undertake external reviews, AusNet provided a sample dataset that compares P50 cost estimates with actual/ estimated costs at completion for a sample of 120 completed and in-flight projects discrete projects.

172. The majority of projects provided are being, or have been, delivered in the current regulatory period.[27] Comparing the P50 estimate of direct costs plus overheads, with the EAC direct costs plus overheads, AusNet indicated that costs were 23% above total P50 estimates. AusNet concluded that, on average, its cost estimates tend towards being conservatively low.

173. However, we observe that this analysis includes volumetric programs. We excluded the volumetric programs, which are subject to a different estimating and commercial arrangement to focus on discrete projects. We also excluded those projects that we considered outliers, where the actual cost was more than ten times the estimate which indicated to us that the estimate was not a reasonable indicator of the final works, or the estimate at completion (EAC) was zero.

174. Absent a review of the reasons for the over/under spend we consider this a reasonable, sample with these exclusions. After adjustment, the portfolio of projects was reduced to 65 projects and the expenditure was approximately 6% below the total P50 estimates. This indicates to us that the cost estimates are typically high, and by an amount similar to the inclusion of the risk allowance.

### Derivation of unit rates is not based on RIN data

175. AusNet states that the unit rates are considered P50, as they reflect either the actual costs of recent, similar projects or risk-adjusted contracted rates. We asked AusNet for a copy of the derivation of unit rates. AusNet stated that it had not used RIN data to develop its proposed unit rates:

> *'Our approach to deriving our proposed unit rates is summarised as follows:*
>
> ***For inspection-based replacement programs** (e.g. poles, cross-arms and other line assets), our unit rates reflect the risk-adjusted contracted Zinfra rate that will apply from 1 August 2025. In some instances, these unit rates exclude the cost of materials (i.e., they are on a 'free issue' basis and require AusNet to provide materials at no cost to Zinfra). In these cases, we have added the cost of materials to the Zinfra contracted rate. The **attached** spreadsheet "AusNet - Line asset unit rate derivations_CONF" provides these workings for a sample of inspection-based program unit rates. Our approach to deriving risk-adjusted Zinfra rates is explained below in response to question 10.v.*
>
> ***For all other replacement programs,** which will be delivered as discrete projects through AusNet's Construction and Design Delivery Panels (rather than through the Zinfra O&M Services Agreement), our proposed unit rates reflect estimated values based on the actual costs of recently delivered, similar projects. The **attached** spreadsheet*

[27] AusNet - P50 vs EAC for sample of Dx projects_CONF

*"AusNet - Discrete project unit rate derivations_CONF" provides these workings and data for a sample of discrete programs.'*[28]

176. We have reviewed the materials provided by AusNet in our assessment of unit rates.

177. In its Regulatory Proposal, AusNet refers to Figure 6-16 that shows historical unit rates as evidence that AusNet's '*decision to partner with Zinfra for O&M services – including inspection-based asset replacement programs – has moderated increases in our repex needs*.'[29] In that figure, the regulatory year RY24 costs are, in general, higher than previous years.

178. We asked AusNet for clarification, and it provided an updated figure with the forecast costs for pole replacement included as shown in Figure 2.3.

179. The added forecast unit rate is the contracted Zinfra rate that will apply from 1 August 2025. AusNet stated that this chart '*demonstrates both the impacts of actual cost pressures during the current regulatory period, and the moderating effects of transitioning to Zinfra on our repex forecast.*'[30]

180. Based on the representations made by AusNet we understood the proposed unit rates were lower than its historical costs. Whilst the chart appeared to demonstrate this, this is clouded by several factors:

- Unit rates include a risk allowance for price risk, presented as risk-adjusted rates. We understand the rates included in the above chart are based on this risk-adjusted rate. We expand on this further below.
- The Zinfra rates exclude fleet and plant and, therefore, are not directly comparable to the historical rates, which are based on the current, Downer OMSA including the costs of fleet and plant. Forecast fleet and plant costs are included separately in the non-network capex forecast, and beyond the scope of our review, and
- Inclusion of contractor support costs above contracted rates - AusNet has added a total of $77 million in contractor support costs via apportionment to individual projects and programs in its capex model. In its Regulatory Proposal, AusNet describes contractor support costs as '*…contractor support costs, which reflect the overhead costs incurred*

28 AusNet response to IR009 Question 10

29 AusNet regulatory proposal EDPR 2026-31 page 130

30 AusNet response to IR009, Question 10

*by our service delivery partners that are not directly attributable to the unit rates we are charged. These costs are passed onto us through the Operations and Maintenance Services Agreement we currently have in place with Downer, which will transition to Zinfra in August 2025.'*[31] AusNet state that its forecast of contractor support costs is based on historical, actual costs and apply to projects and programs delivered through OMSA arrangements in the capex categories of Replacement, Augex and Connections.

181. On the basis that the commercial arrangements have been determined using a market-tested process, the costs of administering the commercial arrangements are reasonable to be included in the capex forecast. AusNet has proposed to apportion these costs, referred to as contractor support costs, to the affected project and programs, and as such they are not transparent for the purpose of our review.

### Unit rates include a risk allowance based on its assessment of expected costs

182. Initially we were concerned that AusNet had included a risk allowance to cover potential changes to labour costs but which would have already been incorporated into the capex forecast.

183. [redacted]

184. We asked AusNet to explain the basis of adding a risk allowance to determine an efficient unit rate based on statements included in its unit rates document, given it had undertaken a market testing process. In response AusNet stated that it has adopted a target cost estimate (TCE) model with the 'efficient' rates applying from year 1 and allowing for a forecast of expected costs over the regulatory period. AusNet summarises the application of the risk allowance as:

[redacted]

[redacted]

[redacted]

31 AusNet regulatory proposal EDPR 2026-31, page 106

32 AusNet's response to IR009, Question 10

185. We have reviewed AusNet's full response including an overview of key elements of the design of the commercial model, and consider the approach adopted by AusNet to include a risk allowance for unit rates over the term of the regulatory period is reasonable. [redacted]

[redacted]

### For the distribution line volumetric repex programs that we reviewed, the unit rates appear to be within a reasonable range

186. Whilst AusNet has not provided a reconciliation between the RIN and the proposed distribution line volumetric program, we undertook an exercise to approximate the unit costs to the RIN asset categories, noting that some of the costs are likely to be a blended costs that account for different materials (e.g. wood vs concrete). As shown in Table 2.3, we consider that this information tends to support the view that AusNet's unit cost assumptions are within a reasonable range of expected unit costs and compare favourably against its historical costs.

[redacted]

187. We consider that this provides additional support to AusNet's claim that the rates are reasonable, noting that our review of the proposed rates was not exhaustive, nor did it review all of the replacement programs that the unit rates apply to. The change in service provider also provides other benefits to AusNet including improved delivery performance for customers.[36]

33 AusNet's response to IR009, Question 10

34 Direct costs expressed in real 2023-24 and excluding contractor support costs, overheads and real cost escalation

35 This may understate the cost assumption, given that there may be a contribution of HV complex poles at a unit cost assumption of 24,676 ($2024)

36 AusNet Regulatory proposal EDPR 2026-31 page 105, and ASD - Coordination Group Engagement material on Service Provider Change – 31 Jan 2025

### 2.4.7 Deliverability

#### AusNet's deliverability assessment has resulted in some augex projects being deferred

188. AusNet has developed a Strategic Deliverability Plan[37] to support its proposed capex for the next RCP. In response to AusNet's assessment of delivery risks, it has smoothed the proposed ramp-up in its capital program during the next RCP, by deferred several augmentation projects beyond their economic timing. The deferred projects include:[38]

- REFCL compliance program
- Morwell Terminal Station (MWTS) South 66kV loop: MWTS-LGA lines upgrade
- Eastern Cranbourne 66kV loop augmentation
- New transformer at Wonthaggi
- New 22kV distribution feeders (WOTS21, SMR11 and WGL31)

189. AusNet also claim that its proposed regional reliability allowance has been deferred, noting that the expenditure and profile is not currently based on an economic assessment. In light of the combination of its top-down adjustments, and capital smoothing, AusNet considers that the proposed expenditure for the next RCP is deliverable.

190. We consider many of the above projects and the proposed timing in our assessment of expenditure in subsequent sections of this report, and conclude that the timing for some projects is not optimal and can be deferred to subsequent RCPs.

#### AusNet's approach to its deliverability assessment is reasonable, however the magnitude of the proposed increases (including expenditure beyond our scope of review) presents major delivery challenges

191. In its Deliverability Plan, AusNet recognises the risks associated with the proposed increase in work volumes, and challenges associated with growing the workforce. AusNet has planned steps to secure the supply of additional resources (including expanding the workforce) and improve internal planning and works management capabilities, and as a result, does not anticipate labour supply shortages or material shortages over the next RCP.

192. We have not undertaken an exhaustive assessment of AusNet's delivery strategy or deliverability assessment of all parts of its proposed program. As a part of our assessment of the proposed expenditure for nominated projects and programs, we consider whether specific delivery risks are present and whether AusNet has taken sufficient account of these in its forecast of expenditure requirements.

193. The actual impact of the energy transition, and specifically increased pressure placed on the supply of key electricity sector resources across the state of Victoria remains uncertain. However, we consider that AusNet has taken reasonable steps to develop the required capacity to deliver its proposed works program.

[37] ASD - AusNet - Strategic Deliverability Plan 2026-31 - 31 Jan 2025 - CONF

[38] AusNet regulatory proposal EDPR 2026-31, page 112

# 2.5 Our findings and implications for our expenditure review

## 2.5.1 Summary of findings

### Presentation of submission information

#### Lack of compelling information for our review

194. The Better Resets Handbook published by the AER nominates four expectations of a network business' capital expenditure proposal. [39]

- Top-down testing of the total capital expenditure forecast and at the category level
- Evidence of prudent and efficient decision-making on key projects and programs
- Evidence of alignment with asset and risk management standards
- Genuine consumer engagement on capital expenditure proposals.

195. Except for consumer engagement, which is beyond our scope of review, we find that AusNet's submission had not in all cases achieved the remaining three expectations.

196. The primary issues relate to the absence of business case justification and modelling for some projects, the application of economic modelling and assumed input assumptions which we consider collectively have led to an overstatement of requirements including advancement of project timing in some instances.

197. Significant change brings a heightened level of uncertainty. Whilst we did not look at all areas of proposed expenditure, we had expected that the methods employed by AusNet to test the robustness of its program in the face of such uncertainty would include greater consideration of alternate programs that could achieve similar service / risk outcomes and emphasis on flexibility and optionality. However, this was not the case.

#### Additional information was necessary to complete our review

198. Additional information was provided in response to our requests, and this was largely helpful. However, as explained in our assessment of the proposed expenditure, we found instances where the justification was insufficient to support the expenditure that was proposed. We expand on this further in our assessment of the expenditure proposed for each of the projects and program in the subsequent sections of this report.

199. The supporting information has focussed on the projects and programs that result in expenditure for the next RCP. Whilst supporting the expenditure, it does not in all instances allow interrogation of the broader planning and prioritisation processes, or confirmation that the business has adequately prioritised the highest risk / benefits areas for consumers.

### Governance arrangements and forecasting methods

#### AusNet has applied top-down adjustments to its forecast expenditure

200. We note that AusNet has applied a top-down adjustment to its proposed repex and augex, and that this top-down adjustment was reflected in its repex and augex forecast. Moreover, AusNet has made further adjustments to the economic timing of projects as a part of resource smoothing / deliverability assessment, which results in deferral of some augex projects.

#### Large proportion of repex is based on inspection-based methods

201. A large proportion of proposed repex is not supported by economic analysis, rather relying on inspection- or condition-based methods. The absence of economic analysis does not

[39] AER. Better Reset Handbook - December 2021.

assist with determining how a proposed prudent and efficient replacement program has been determined. Particularly where economic assessment methods have not been applied, we expected to see, and did not see, sufficient analysis of scenarios including alternate volumes to ascertain changes to the service / risk outcomes, as a means to demonstrate that the volumes included in the expenditure forecast were prudent and reasonable.

### We found instances where the modelling methods applied by AusNet were flawed

202. Risk cost assessment and economic modelling are crucial for determining the optimal timing of electricity infrastructure investments. Net Present Value (NPV) analysis serves as a foundational tool in this process, enabling stakeholders to evaluate the financial viability and timing of investments under uncertainty.

203. We also found evidence where the timing was determined based on the first year it yields a positive benefit, but which is not equivalent to identifying the year the project should be undertaken to achieve maximum benefit. AER has a published guideline on this, and proper application of the methods referred to in this guideline would tend to indicate later justified timing, supportive of a smaller program in the next period than AusNet has proposed.

### AusNet's economic analysis relies heavily on the input assumptions that AusNet has applied, but which are not always supportable

204. We have noted the potential impact to the proposed expenditure of the assumptions relied upon by AusNet in its modelling, including that many of the substation VCRs appear to reflect a higher value of VCR than may be derived from AER's most recent 2024 VCR study. We consider this further in our assessment of the project expenditure and which we consider tends to lead to AusNet's unwarranted advancement of the timing of the proposed expenditure.

### Application of risk allowances to development of cost estimates to determine expected costs vary across the forecast

205. AusNet has changed its delivery partner, including the commercial model for elements of its capex program and the unit rates that AusNet has assumed from its new delivery arrangements.

206. For its unit rates, AusNet has adopted risk-adjusted rates for the inspection-based replacement programs were determined as the volume weighted average of the region risk-adjusted rates. These are derived from providers following its market-testing process to determine the expected cost to deliver its program, and not from its RIN data. For the projects and programs of repex that we considered, we understand the use of revealed costs would have resulted in higher unit rates than it has proposed.

207. We also saw evidence of risk allowances being applied to discrete project costs for repex and augex. Whilst the cost estimation methodology explains that these are included on risk adjusted basis, the unit costs we observed the risk allowance as allocated as a nominal percentage of the total cost. When considered against a bottom-up build of the costs estimate, and then across the portfolio of P50 estimates, there is likely to be sufficient uncertainty included in the project cost estimates that a further risk allowance is not required.

208. Review of discrete project estimates also indicated that recent projects were being delivered below the P50 cost estimates as a bundle and which suggested that a percentage, similar to the risk allowance should be removed.

209. Our review of the proposed rates and cost estimates was limited to the projects and programs that we reviewed and therefore may not be transferrable to all parts of the proposed expenditure forecast.

AusNet's approach to its deliverability assessment is reasonable, however the magnitude of the proposed increases (including expenditure beyond our scope of review) presents major delivery challenges

210. In its deliverability plan, AusNet recognises the risks associated with the proposed increase in work volumes, and challenges associated with growing the workforce. As a part of our assessment of the proposed expenditure for nominated projects and programs, we consider whether specific delivery risks are present and whether AusNet has taken sufficient account off these in its forecast of expenditure requirements.

211. The actual impact of the energy transition, and specifically increased pressure placed on the supply of key electricity sector resources across the state of Victoria remains uncertain. However, we consider that AusNet has taken reasonable steps to develop the required capacity to deliver its proposed works program.

### 2.5.2 Implications for the expenditure forecast

212. We consider the implications of these findings in our review of the specific projects and programs in the subsequent sections of this report.

# 3 REVIEW OF PROPOSED REPLACEMENT EXPENDITURE (REPEX)

AusNet has proposed a material uplift in repex activity relative to the repex that it expects to incur in the current period. The forecast repex proposed by AusNet was separated into three parts: Asset replacement, safety and compliance. Our review is focused on the major drivers of expenditure.

The AER has asked us to assess a subset of AusNet's proposed $1,316.9 million replacement capex for the next RCP, across most of its asset groups and which accounts for approximately 60% of the proposed repex.

We have found issues with the modelling applied for the asset replacement program, that reflect an estimate of volume and unit costs that are higher than a prudent and efficient level. For the safety-related expenditure, AusNet has not sufficiently demonstrated the need for an uplift for the projects that it has proposed, based on either its economic modelling where it has been provided, or on the performance of the network.

We consider that the compliance-driven expenditure is reasonable, and that the proposed option is prudent.

Overall, we consider that the proposed repex of $787.9 million that we have been asked to review is not a reasonable forecast of its requirements and is materially overstated. AusNet has not sufficiently demonstrated the need for a level of repex that is 67% above the level of repex that it expects to incur in the current RCP. We consider a reasonable alternate estimate of repex is 35 to 40% lower than AusNet has proposed.

## 3.1 Introduction

213. We reviewed the information provided by AusNet Services to support its proposed repex forecast, including a sample of projects and programs. We sought to establish the strategic basis for, and the reasonableness of the proposed repex for each of the identified projects and programs that we were asked to review. Forecast expenditure in the next RCP is reflective of a step increase from the historical expenditure that AusNet Services has incurred and is expected to incur in the remainder of the current RCP.

214. To the extent that AusNet Services has explained the dependencies across each of the projects and programs included in its forecast repex we have referred to this in our assessment. We present our assessment using the asset groups included in the RIN. In many cases, our scope did not extend to all projects and programs included in the RIN asset group or take account of the apportionment of repex between projects and programs and the RIN asset groups. We refer to the information we have relied upon in our analysis in the sections that follow.

215. We first summarise and compare the proposed expenditure for the next RCP with its historical actual and estimated expenditure in the prior and current RCPs and relate our scope of review to the proposed repex by RIN asset group.

## 3.2 What AusNet has proposed

### 3.2.1 Proposed repex by program

216. AusNet is proposing an increase to its repex program compared with the current period expenditure. Key drivers of AusNet's repex forecast include: [40]

- Deterioration in asset condition associated with increasing asset age
- Increasing unit rates and project cost estimates reflecting external, market-driven cost pressures
- Developed using an economically justified, risk-based asset management approach.

217. In its regulatory proposal, AusNet states that:

> *'Our forecast repex for the 2026-31 regulatory period is $831.2m, which is 29% higher than our expected repex of $645.8m in the current regulatory period. As shown in the figure below, forecast annual average repex of $166m is 8% above planned spend in 2025-26 of $155m.'* [41]

218. We understand that the repex figure quoted by AusNet excludes safety programs, resilience programs, OT systems including the advanced distribution management system (ADMS) and metering systems (based on changes to metering allocation to SCS). We have made these adjustments and cannot reproduce this figure from AusNet's proposal. We have relied on information contained in AusNet's capex model.

219. We present AusNet's repex proposal by program in Table 3.1.

*Table 3.1: AusNet proposed and current actual/estimate repex by program- $m, real FY2026*

| Program | Current RCP | 2026-27 | 2027-28 | 2028-29 | 2029-30 | 2030-31 | Next RCP |
|---|---|---|---|---|---|---|---|
| Replacement | | 139.7 | 166.2 | 184.3 | 199.6 | 201.1 | **890.8** |
| Safety and environmental | | 25.0 | 24.7 | 24.4 | 27.2 | 25.4 | **126.7** |
| Compliance | | 3.4 | 3.4 | 3.4 | 3.5 | 3.5 | **17.3** |
| Resilience | | 10.3 | 40.4 | 67.5 | 51.7 | 47.2 | **217.1** |
| Metering SCS | | 3.5 | 3.4 | 4.4 | 6.5 | 6.9 | **24.7** |
| ICT non-recurrent (ADMS) | | 8.0 | 8.0 | 8.0 | 8.1 | 8.2 | **40.3** |
| **Total repex** | **789.3** | **189.9** | **246.1** | **292.0** | **296.5** | **292.3** | **1,316.9** |

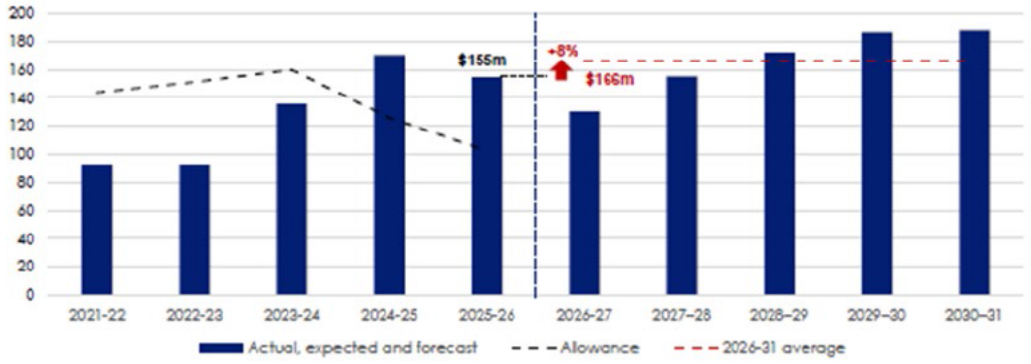
*Source: EMCa table derived from AusNet SCS Capex Model and AusNet annual RIN*

220. Compared with the current RCP, AusNet is proposing an increase of $527.6 million. In its regulatory proposal, the proposed asset replacement program is slightly higher than in the current RCP as shown in Figure 3.1, highlighting that most of the increases to repex are being driven from the additional repex programs: safety, compliance, resilience and IT. This trend intuitively aligns with the increases we observe at the RIN asset group level.

40 EMCa derived from AusNet regulatory proposal EDPR 2026-31, page 126

41 AusNet regulatory proposal EDPR 2026-31, page 125

*Figure 3.1: AusNet proposed repex compared with current and historical - $m, real 2023-24*




*Source: AusNet regulatory proposal, Figure 6-10*

### 3.2.2 Proposed repex by RIN asset group

221. We present AusNet's repex proposal by RIN asset group in Table 3.2 inclusive of replacement, safety, compliance and resilience programs totalling $1,316.9 million for the next RCP.

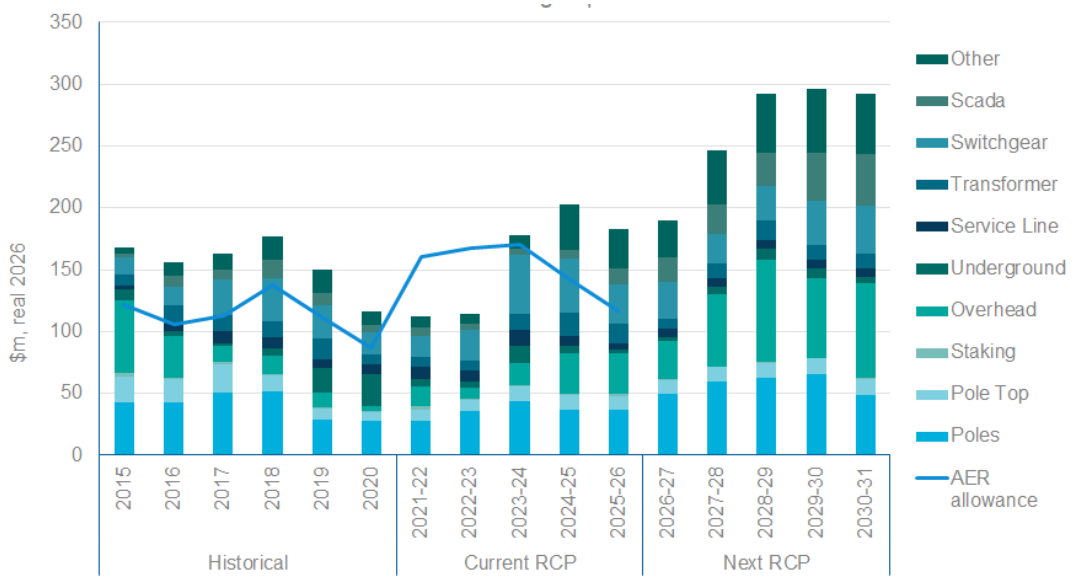
*Table 3.2: AusNet proposed and current actual/estimate repex by RIN asset group- $m, real FY2026*

| Asset Group | Current RCP | 2026-27 | 2027-28 | 2028-29 | 2029-30 | 2030-31 | Next RCP |
|---|---|---|---|---|---|---|---|
| Poles & staking | **187.6** | 49.8 | 60.0 | 63.0 | 66.0 | 49.0 | **287.8** |
| Pole top structure | **54.2** | 11.6 | 11.9 | 12.3 | 12.8 | 13.2 | **61.8** |
| Overhead conductor | **108.1** | 30.9 | 58.4 | 82.8 | 64.3 | 77.1 | **313.6** |
| Underground cable | **32.6** | 3.5 | 5.8 | 9.3 | 8.2 | 4.7 | **31.3** |
| Service line | **44.4** | 6.9 | 7.0 | 7.0 | 7.1 | 7.2 | **35.2** |
| Transformer | **64.2** | 7.8 | 12.4 | 15.6 | 11.4 | 11.5 | **58.6** |
| Switchgear | **166.4** | 29.7 | 23.5 | 27.3 | 36.1 | 38.9 | **155.5** |
| SCADA, network control and protection | **36.5** | 19.8 | 24.1 | 27.4 | 38.6 | 41.8 | **151.6** |
| Other | **95.4** | 30.0 | 43.0 | 47.4 | 52.1 | 48.9 | **221.4** |
| **Total** | **789.3** | **189.9** | **246.1** | **292.0** | **296.5** | **292.3** | **1,316.9** |

*Source: EMCa table derived from AusNet RIN Workbook 1 – forecast 31 Jan 2025 and AusNet annual RIN*

222. The historical and forecast repex by RIN asset group is shown in Figure 3.2.

*Figure 3.2: AusNet proposed repex compared with current and historical - $m, real FY2026*




*Source: AusNet RIN Workbook 1 – forecast 31 Jan 2025 and AusNet annual RIN*

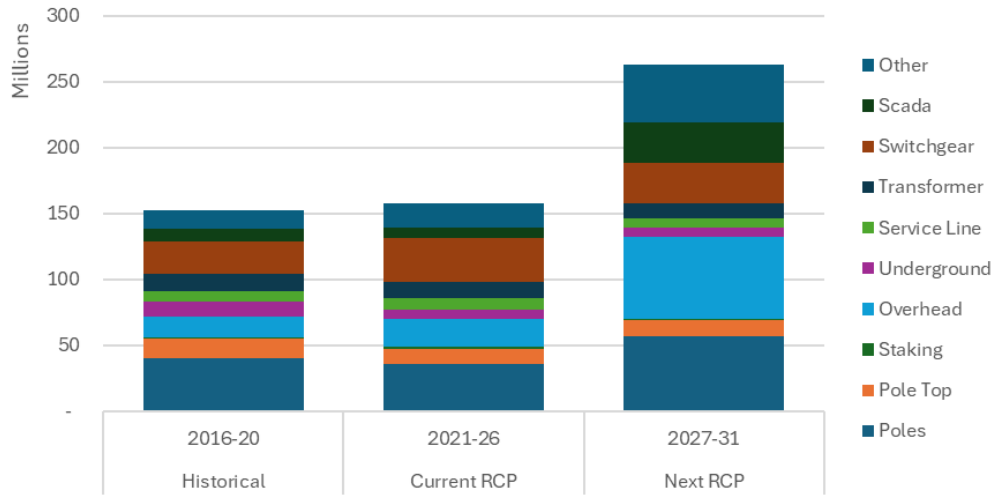
223. The profile of repex shows a back-ended forecast, and which is opposite to the allowance, with a further uplift proposed for the next RCP. AusNet expects a slight overspend in repex for the current RCP, contributed by:

- increasing labour and material costs due to market-driven cost pressures affecting the whole industry; and
- deferral of zone substation rebuilds and some repex programs from earlier in the period.

224. Whilst the profile of repex in the current RCP differs from the that included in the capex allowance, it is similar in magnitude, on average, to the historical repex.

225. The expenditure trend is also evident in the comparison of the annual average repex across each of the most recent five-year periods. For the next RCP, the step increase is more apparent with large increases in poles, overhead conductor, SCADA and other repex asset groups as shown in Figure 3.3.

*Figure 3.3: AusNet proposed repex compared with current and historical - $m, real FY2026*




*Source: AusNet RIN Workbook 1 – forecast 31 Jan 2025 and AusNet annual RIN*

226. For substation related repex, we observe that:

- the proportions within substation-related asset groups have also changed. For transformers, smaller volume of higher value transformers – focussing on substation rebuild projects. Whilst the proposed capex is similar in magnitude to previous regulatory periods, the expenditure is dominated by substation rebuilds. However, the number of substation projects is similar, and
- For switchgear, the largest increase is associated with fuse replacement.[42] Trends across years is more informative than movement in any one year due to the potential for differences in accounting for expenditure and asset replacement volumes, with the latter often delayed until commissioning which may be much later than the expenditure was incurred.

### 3.2.3 Updated proposal

227. In response to a request for information following our onsite discussion with AusNet, we were provided with a revised capex model. AusNet reduced its proposed repex by $7.4 million, comprising approximately $6 million from its control box repex program due to an incorrect unit rate applied by AusNet, and it also made adjustments to a number of repex and augex projects. On review of the revision history included in the revised capex model, we noted the entry:

> *'16/05/2025, Input| Projects – columns K to O, IR020: Updates to two Repex projects (before Zinfra support costs) in rows 48 and 50 and redistribution of Zinfra support costs across all Repex and Augex projects.'*[43]

228. At a total repex level, the changes are summarised in Table 3.3.

*Table 3.3: AusNet proposed for repex (revised) - $m, real FY2026*

| Total repex | 2026-27 | 2027-28 | 2028-29 | 2029-30 | 2030-31 | Total |
|---|---|---|---|---|---|---|
| Initial submission | 189.9 | 246.1 | 292.0 | 296.5 | 292.3 | **1,316.9** |
| Updated capex model provided in response to IR020 | 196.8 | 245.4 | 289.6 | 291.2 | 286.4 | **1,309.5** |

*Source: EMCa table, derived from IR020 updated SCS model (ASD - AusNet EDPR 2026-31 – SCS Capex Model – Update - 16052025)*

229. Given the lateness of this revised capex model, we have continued to rely on the capex model provided with AusNet's submission for our assessment. For the control box repex program, we have noted that AusNet proposed to reduce the proposed expenditure by approximately $6 million due to an error in the adopted unit rate.

### 3.2.4 EMCa's Scope of Repex Review

230. Of the $1,316.9 million repex that AusNet has proposed for the next RCP, our scope relates to $787.9m (or approximately 60%) as shown in Table 3.4.

42 Despite missing asset replacement volumes in 2024-25 and 2025-26, AusNet reported expenditure in those years

43 IR020 updated SCS model (ASD - AusNet EDPR 2026-31 – SCS Capex Model – Update -16052025)

*Table 3.4: Repex within EMCa scope by driver - $m, real FY2026*

| Driver | 2026-27 | 2027-28 | 2028-29 | 2029-30 | 2030-31 | Total |
|---|---|---|---|---|---|---|
| **Replacement** | | | | | | |
| Station rebuilds | 7.9 | 17.3 | 25.1 | 29.4 | 23.6 | **103.3** |
| Plant | 9.8 | 12.1 | 13.3 | 13.5 | 16.9 | **65.6** |
| Switches & Other | 4.0 | 7.8 | 8.6 | 11.2 | 11.6 | **43.2** |
| Substation Protection | 10.2 | 13.2 | 14.6 | 18.4 | 19.0 | **75.4** |
| Poles | 43.2 | 42.7 | 42.3 | 42.2 | 42.0 | **212.5** |
| Crossarms | 8.5 | 8.9 | 9.2 | 9.7 | 10.1 | **46.4** |
| Conductor | 24.5 | 25.0 | 25.5 | 26.0 | 26.2 | **127.1** |
| **Safety** | **21.6** | **19.0** | **18.0** | **19.6** | **19.0** | **97.2** |
| **Compliance** | **3.4** | **3.4** | **3.4** | **3.5** | **3.5** | **17.3** |
| **Total** | **133.1** | **149.4** | **160.2** | **173.4** | **171.9** | **787.9** |

*Source: EMCa table, derived from AusNet SCS capex model*

231. We have undertaken our review based on the program descriptions proposed by AusNet in its submission. We first present a high-level summary of each of the projects / programs that we have been asked to review, then our assessment of the proposed expenditure:

- AusNet has included replacement of its ADMS system in a project titled '*10 ADMS Energy Management (SCADA/OT portion)*' as repex. We consider this as a part of our assessment of the Digital program in a separate report to the AER.
- AusNet has included a further $11.2 million for development of a 3D model based on the LiDAR results in its Digital program (non-network capex) to complement the low service program included in the compliance repex. We consider there are sufficient synergies across the two projects to include this in our review of the proposed repex.

232. In summary, we present our assessment of $799.1 million (i.e. including the LIDAR ICT project) in the following sections of this report.

## 3.3 Assessment of replacement programs

### 3.3.1 Station rebuilds

#### What AusNet has proposed

233. AusNet has included seven substation rebuild projects for the next RCP including two in-flight projects at a total estimated cost of $103.3 million as shown in Table 3.5.

*Table 3.5: AusNet proposed for station rebuild repex - $m, real FY2026*

| Station rebuilds | 2026-27 | 2027-28 | 2028-29 | 2029-30 | 2030-31 | Total |
|---|---|---|---|---|---|---|
| Kilmore South ZSS 22kV Switch room | 2.4 | 4.0 | 1.6 | - | - | **8.0** |
| Newmerella Refurbishment | - | - | - | 2.3 | 11.5 | **13.7** |
| Thomastown Stage 2 - 22kV upgrade | 3.8 | 9.6 | 11.6 | 7.8 | - | **32.9** |
| Traralgon Stage 2 - 22kV switchboard upgrade | - | - | 2.7 | 8.2 | 2.8 | **13.6** |
| Watsonia Refurbishment | - | 3.7 | 9.2 | 11.1 | 9.4 | **33.3** |
| Traralgon ZSS Stage 1 | 0.6 | - | - | - | - | **0.6** |
| Warragul ZSS Rebuild | 1.1 | - | - | - | - | **1.1** |
| **Total** | **7.9** | **17.3** | **25.1** | **29.4** | **23.6** | **103.3** |

*Source: EMCa table, derived from AusNet SCS capex model*

234. AusNet states that zone substation rebuilds are packaged works to replace a variety of assets deemed economically viable, where the packaging these works unlocks both financial and time efficiency. The main driver of the assets targeted for replacement is generally asset condition which is a result of age and the criticality of the associated primary assets.

235. AusNet states that the proposed substation rebuild repex is $17 million lower than during the current RCP.

### Assessment

#### Three substation rebuild projects were approved for the current period

236. AusNet proposes seven substation rebuild projects for the current RCP, and included projects located at Watsonia, Thomastown and Traralgon. AusNet stated that these projects were approved as a part of the determination for the current period.

237. In the final determination for the current period, the AER set out an alternate estimate for capex. To our reading, the alternative estimate reflects adjustments to reclassifications of capex, changes in economic conditions, and updates proposed by AusNet Services. AusNet has concluded that the above substation rebuild projects[44] were therefore approved as a part of the AER final determination.

[44] AusNet regulatory proposal 2022-26, 31 January 20202, table 9-5, page 78-79

*Table 3.6: Substation rebuild projects included in current RCP*

| Substation | Description of substation assets and scope of project |
|---|---|
| Watsonia | *The project involves replacing the 22 kV circuit breakers.*<br>*This substation commenced operation in the late 1950s with two 66/22 kV power transformers. A third transformer was installed in 2010, and the station now includes two 66 kV bus-tie circuit breakers and is supplied by wo incoming 66 kV lines. The outdoor 22 kV switchyard consists of eleven 22 kV feeders and a 10 MVAr capacitor bank. To manage short circuit current levels within asset capabilities and rules requirements, only two of the power transformers operate in parallel, with the third operating as a hot spare under normal conditions via normally open 22 kV transformer circuit breakers connected to each of the 22 kV buses. This arrangement allows quick restoration to near system normal capacity following outage of either of the two normally loaded transformers. There are fifteen 22 kV bulk-oil circuit breakers at the station which were installed in the 1950s and 1960s. The physical and electrical condition of these assets has deteriorated, and they are now presenting an increasing risk of failure.* |
| Traralgon (Stage 2) | *The project involves replacing two transformers, 66 kV circuit breakers and 22 kV switchgear.*<br>*This substation commenced operation as a 66/22 kV transformation station in 1969. There are two 10/13.5 MVA transformers, were manufactured in 1949 and 1979, and one 20/33 MVA transformer, manufactured in 2012. The 22 kV switchyard consists of one indoor switchboard with four feeders installed in 2013, and three outdoor 22 kV busses with four feeder circuit breakers installed in 1969. The 66 kV switchyard has had some modifications since the site was established and now consists of two 66 kV lines to MWTS and one line to Maffra one substation. Two of the 66 kV circuit breakers were installed in 1977, while the other two were installed in 2013 when the new 20/33 MVA transformer was installed. The physical and electrical condition of some assets has deteriorated, and they now present an increased failure risk. The station 66 kV bus is partially switched with the two 10/13.5 MVA transformers connected in a single switching zone group.* |
| Warragul | *The project involves replacing the four 10/12.5 MVA transformers with two 20/33 MVA transformers, replacing the existing capacitor bank and installing two new 66 kV circuit breakers. (The existing C5 66 kV circuit breaker is being replaced under a separate project in 2021)*<br>*This substation commenced operation as a 66/22 kV transformation station in 1962. Three 10/12.5 MVA transformers were installed in 1962. A fourth 10/13.5 MVA transformer was added in 1997 as a replacement for an existing 5/6.5 MVA transformer, however this transformer was manufactured in 1965. A fifth 20/33 MVA transformer was added in 2011.The 66 kV switchyard was constructed in the 1960s, with the exception of an additional 66 kV CB added in 2011 when the fifth transformer was installed. The 22 kV switchyard was replaced by an indoor switchboard in 1997. The physical and electrical condition of some assets has deteriorated, and they are now presenting an increasing failure risk. The station has a 66 kV ring bus arrangement but is partially switched with the four 1960s vintage transformers switched as a single group, and a normally open isolator in place of a 66 kV circuit breaker between the two 66 kV line entries from the Yallourn Power Station.* |

*Source: AusNet regulatory proposal 2022-26, 31 January 20202, table 9-5, page 78-79*

238. In the regulatory proposal for the next RCP, AusNet states that it has undertaken a re-assessment of the network risk, project costs and economic timing. As a result of this re-assessment, Traralgon and Thomastown have been partially deferred, and Watsonia fully deferred to the 2026-31 regulatory period.

239. We note that the forecast repex for the next RCP includes $1.5 million to complete the Traralgon ZSS Stage 1 and Warragul ZSS Rebuild projects in year 1 of the next RCP and is reasonable. These projects have previously satisfied RIT-D assessments. Similarly, we consider the revised timing for Watsonia substation as reasonable.

### New substation rebuild projects are aligned with the published DAPR and include projects subject to RIT-D assessments

240. Three of the proposed projects have been subject to RIT-D as outlined in Table 3.7. We have also included the new proposed completion dates included in the regulatory proposal.

*Table 3.7: Summary of completed RIT-D for proposed substation rebuild projects*

| Substation | Latest RIT-D report | Preferred option | Target completion date | New proposed completion date |
|---|---|---|---|---|
| Warragul (WGL) | Final Project Assessment Report (published April 2022) | Replace four transformers with two transformers, replace the existing capacitor bank and install two new 66kV circuit breakers | Dec 2024 | 2030/31 |
| Thomastown (TT) | Final Project Assessment Report (published February 2023) | Replace 66kV and 22kV switchgear (as per Option 5), with different staging | Stage 1 (66kV) May 2026<br>Stage 2 (22kV) March 2030 | Stage 2 2029/30 |
| Traralgon (TGN) | Final Project Assessment Report (published April 2023) | Integrated replacement, with different staging, which we understand includes replacement of No.2 and No.3 transformers, new indoor 22kV switchboard, and 66kV ring bus arrangement. | Stage 1 (66kV) 2026[45]<br>Stage 2 (22kV) 5-10 years after Stage 1[46] | Stage 1 2026/27<br>Stage 2 2030/31 |

*Source: Derived from AusNet website, RIT-D documents and regulatory submission*

241. We observe that the proposed project completion dates are aligned with or are later (in the case of Warragul) than published in the RIT-D assessment.

### Projects consider a reasonable set of options

242. As the projects deferred from the current RCP were considered as previously approved, and also subject to RIT-D, we focussed on the new projects. We consider that these projects are reasonably formed, and AusNet has considered a reasonable set of options.

243. For example, the following options have been identified to address the risk at NLA:

- (1) Do Nothing
- (2) Retire one transformer
- (3) Retire one transformer and sure up supply capacity via network support
- (4) Network support to defer retirement and replacement
- (5) Replace 22kV switchgear
- (6) Replace transformers
- (7) Replace transformers and 22kV switchgear
- (8) Replace transformers, 22kV switchgear and 66kV VTs

244. The preferred option for NLA is option 8, which becomes more economic than option 7 after 2030 for which AusNet have concluded the economic timing is 2030/31. However, option 7

[45] Two dates were listed for completion of stage 1, being 2024 and 2026

[46] As stated in AusNet's documentation, whereas the new proposed completion is approximately 4 years after completion of stage 1

and option 8 do not address the same risk, as option 8 also includes replacement of 66kV VTs. Notwithstanding the above, the preferred option 8 for NLA and more generally the preferred option for each of the substation sites has the highest NPV of the assessed options.

### Forecasting method adopted by AusNet is reasonable

245. AusNet states that it has prioritised asset replacements based on net present value (NPV) and asset health, targeting zone substations (ZSS) to assemble economically justified programs. The forecast is based on an assessment of site risk. During the onsite discussion we received a demonstration of the models that outlined the condition information that led to derivation of a PoF.

246. The model includes a derivation of PoF from a health index (HI) and also relates this to age, and the application of consequence of failure (CoF) from event trees. During the onsite discussion we received a demonstration of the 'safety – power transformer' event tree, however the probability factors were not able to be explained and there was no identified source for calculation of these values. We asked for and were provided with the event trees and the origins of key input assumptions relied upon by AusNet in the calculation of its consequence values. We are satisfied with the responses to our questions, that is, the values applied are within a reasonable range for this analysis.

### Sensitivity analysis adopts a reasonable range of factors

247. During the onsite discussion we understood that a sensitivity analysis had been undertaken for transformer and switchgear projects, but that it was outside of the models demonstrated. We requested that AusNet describe the sensitivity analysis undertaken and to provide evidence of its application to the options selection and economic timing for the proposed transformer and switchgear projects. We are satisfied with AusNet's responses to our question.

248. The economic assessment is tested for the following sensitivities:

- Asset failure rates, varied at ±50% of the base failure rate
- Maximum demand forecasts, varied to ±5% of the base forecast
- Value of customer reliability (VCR), varied to ±25% of the base VCR
- Proposed option costs, varied to ±15% of the base option cost, and
- Discount rate of 5.56%, varied to ±2% per annum of the base discount rate.

### AusNet's VCR values are higher than indicated in AER's latest publication

249. Based on our analysis, we identified VCR values that exceed those included in the AER 2024 publication. This is despite AusNet stating in its regulatory proposal that its VCR, based on its own independent quantitative customer value (QCV) analysis were largely consistent with the AER's 2024 VCR study.

250. We conducted our own analysis making use of the customer weighting included by AusNet. The VCR adopted in the model did not align with the AERs VCR based on the 2019 study escalated to $2024 or the 2024 study and were over-stated by up to 31% in the latter. We include a copy of our results in Table 3.8.

*Table 3.8: Comparison of VCR assumptions for substation rebuild projects, $2026*

| | TT | WT | KMS | NLA | TGN |
|---|---|---|---|---|---|
| **Customer type** | | | | | |
| Residential | 26 | 46 | 53 | 55 | 44 |
| Agricultural | 0 | 0 | 4 | 12 | 7 |
| Commercial | 52 | 49 | 35 | 23 | 38 |
| Industrial | 22 | 5 | 8 | 9 | 10 |
| **Total** | **100%** | **100%** | **100%** | **100%** | **100%** |
| **VCR ($/kWh)** | | | | | |
| ASD assumption | 55.2 | 52.4 | 53.0 | 52.8 | 52.9 |
| 2019 study | 51.6 | 42.0 | 40.5 | 39.5 | 43.2 |
| 2024 study | 38.0 | 41.2 | 41.7 | 41.1 | 40.0 |
| **Reduction in VCR of 2024 study relative to ASD assumption** | **31%** | **21%** | **21%** | **22%** | **25%** |

*Source: EMCa analysis derived from substation rebuild model*

251. Despite these findings, we consider that this range is broadly included in the adoption of the +/- 25% sensitivity range for VCR applied by AusNet, and which does not alter the preferred option for the substations that we reviewed.

### The project timing is likely to be later than indicated from AusNet's economic analysis, which is in part accounted for in the post model adjustments

252. Zone substation rebuilds are packaged works to replace a variety of assets deemed economically viable. AusNet states that packaging these works unlocks both financial and time efficiency. The main driver of replacements is asset condition which is a result of age and the criticality of the associated primary assets.

253. AusNet states that its economic analysis has identified the option that maximises the net economic benefit. We understood that some sensitivity analysis had been undertaken, and we asked AusNet to provide evidence of its application to the options selection and economic timing for the proposed transformer and switchgear projects. In Table 3.9 we compare the results of its model with other sources included in its response for each substation. This includes post-model adjustments applied by AusNet based on expected deliverability constraints, resulting in deferral all projects with the exception of KMS due to an identified safety concern.

*Table 3.9: Comparison of economic timing and completion year for substation rebuilds*

| | AMS (preferred option timing) | IR response (assuming all capex in that year) | After post model adjustment (assuming profile of capex) | Capex model (final year of capex) |
|---|---|---|---|---|
| TT | 2026 | 2026/27 | 2030/31 | 2029/30 |
| WT | 2029 | 2029/30 | 2030/31 | 2030/31 |
| KMS | 2026 | 2026/27 | 2028/29 | 2028/29 |
| NLA | 2030 | 2030/31 | 2030/31+ | 2030/31 |
| TGN | 2026 | 2026/27 | 2030/31 | 2030/31 |

*Source: EMCa derived from EMCa IR#020 - Station rebuild response - Q4-5 and AMS documents*

254. We observe that the capex disbursement included in its capex model largely aligns with the project timing indicated after post model adjustment, and which is generally later than indicated by AusNet's determination of economic timing. The exception is for TT, which shows the timing in the capex model as being earlier than indicated by the post model adjustments.

255. AusNet correctly refers to the derivation of project timing based on an assessment of cumulative annual benefit and annualised cost:

> *'The optimal economic timing of the proposed option is the point in time when the annual benefit of implementing the proposed option outweighs the annualised cost to implement that option.'*[47]

256. For example, using this method, AusNet states that the optimal timing for its preferred option at NLA is 2025/26. However, AusNet also states that its preferred option 8 is not the option that maximises benefits until after 2030, and after which time the annualised net economic benefits continue to increase.[48] AusNet adopts timing that reflects the latter case for NLA. Our review of the analysis presented by AusNet indicates that the point at which the benefits are maximised, as an indicator of the optimised timing, is likely to be later than AusNet has indicated.

### We found further modelling issues, but they do not have a material impact on the preferred option selection

257. Other factors that we consider do not represent good practice modelling methods, such as the inclusion of the risk cost in the annualised cost stack, and in the determination of an annualised cost. Whilst small, the risk cost is meant to value the risk and is not a cost to the business until the risk is realised. However, for the projects that we reviewed, we found that this does not alter the options analysis outcomes.

### Cost estimates include a risk allowance on top of unit rate-based estimates

258. AusNet has included a breakdown of its cost estimate for each of the new projects for the next RCP in the project assessment reports.

259. On review of specific line items, we found that key asset costs are developed from the same unit costs applied for the substation plant items, also drawing from past project estimates and also rounded estimates for specific items (e.g. [redacted] for a sound wall). In the substation plant items (discussed in section 3.3.2), we found that a nominal risk allowance of 8% (on average) had been applied to the individual cost estimates. Given the accuracy level of the P50 estimate, as explained in section 3.4.2, we do not consider that the inclusion of the risk allowance in this way should be included. This is supported by analysis of the cost estimation accuracy of a portfolio of discrete projects which indicates that the EAC is lower than the P50 estimates when compared at a program level, as discussed in section 2.4.6.

### AusNet has included post model adjustments to remove scope overlaps and improve deliverability

260. To avoid overlaps, AusNet states that it has removed assets to be replaced in the zone-substation program from the overall replacement program, which has reduced the total repex forecast by $24.5 million.[49] We were not provided the detail of the reduction and consider that this reduction has been applied to the asset replacement projects and not the substation rebuild projects.

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47 AMS 20-262 – NLA ZSS Rebuild, page 18

48 Refer to Table 8 of ASD - AusNet - Zone Substation rebuild assessment reports - NLA-31 Jan 2025

49 ASD - AusNet - Top Down Adjustment - 31 Jan 2025 - PUBLIC

### Reductions to proposed capex appear to account for additional scope items included in cost estimates

261. In three of the projects (WT, TT and NLA), we observed estimated costs in the project assessment reports and modelling being higher than that included in the cost build-up model,[50] both of which are expressed in $2024. We consider that the difference for NLA is most likely explained by the timing of the project extending into the subsequent RCP.

262. In the cost estimate for WT and TT we found that the estimate included additional scope items than indicated. For example, the base cost estimate for KMS for a new modular 22kV switch room was [redacted], then costs were added for an additional 3 switchrooms for WT. This suggests the costs are based on four switchrooms when only three are included in the scope. We calculate that the additional cost of these scope items is similar to the difference in costs we observed from the different sources of information, and therefore this is the likely cause.

263. If the reduction in scope has not been accounted for as we have observed, a further reduction to the proposed capex would be required.

264. Whilst a reduced cost for the same benefits will result in a higher NPV, to the extent the reduced cost reflects a reduction in scope (compared to that modelled), we would expect that the benefits are also reduced. As the NPV results are sufficiently positive, and the projects are planned for completion later than the preferred timing, we don't expect that this will result in the selection of a different option or timing compared with AusNet's preferred option.

### AusNet has deferred the timing of its substation rebuilds

265. AusNet stated that it has made further adjustments to the timing of the substation projects (referred to as post model adjustments) to address expected deliverability constraints. The final expenditure profile reflecting the revised deliverability is shown in Table 3.10. We understand that the timing of KMS was prioritised due to identified safety concerns.[51]

*Table 3.10: Timing for substation rebuild projects, $m 2024*

| | Proposed economic timing | Proposed timing of expenditure after post model adjustments | | | | | |
|---|---|---|---|---|---|---|---|
| | | 2026-27 | 2027-28 | 2028-29 | 2029-30 | 2030-31 | Total |
| TT | 2026-27 | | 3.4 | 8.4 | 10.1 | 6.8 | **28.7** |
| WT | 2029-30 | | 3.2 | 8.0 | 9.6 | 8.0 | **28.9** |
| KMS | 2026-27 | 2.1 | 3.5 | 1.4 | | | **7.0** |
| NLA | 2030-31 | | | | 2.0 | 9.8 | **11.8** |
| TGN | 2026-27 | | | 2.4 | 7.1 | 2.4 | **11.8** |

*Source: EMCa derived from IR020, station rebuild response question 4-5*

266. We observe that the timing in Table 3.10 largely aligns with the submission, other than for Thomastown, whereby the regulatory proposal shows this as commencing in 2026-27. The actual timing will be confirmed via the formal RIT-D process.

### Findings

267. We consider the proposed repex for the station rebuild program is overstated.

268. Based on our review of substation plant we identified concerns with the application of risk allowances to the unit rates applied to those projects. We consider that the same nominal risk allowances are present in the cost estimates for the rebuild projects and have not been adequately justified.

50 ASD - AusNet - Replacement and safety programs - cost buildup - 31 Jan 2025 - CONF

51 IR020

269. We observed that the capex included in the regulatory proposal, and which we understood was correct, was lower than the cost provided by AusNet in its cost estimates and has likely addressed the differences in scope that we observed.

270. AusNet states that it intends to begin implementing the preferred option around the 'optimal' timing that AusNet has indicated, allowing for time to complete the required RIT-D. Whilst the nominated project timing includes some deferral from its economic analysis, and may assist deliverability as stated by AusNet, we are not convinced by the analysis of optimal timing for all projects. Specifically, that some parts of the program may be further deferred resulting in a smaller program than AusNet has proposed.

## 3.3.2 Plant

### What AusNet has proposed

271. AusNet has included five plant projects for the next RCP, including two in-flight projects at a total estimated cost of $65.6 million as shown in Table 3.11.

*Table 3.11: AusNet proposed for plant repex - $m, real FY2026*

| Plant | 2026-27 | 2027-28 | 2028-29 | 2029-30 | 2030-31 | Total |
|---|---|---|---|---|---|---|
| 66kV Circuit breakers | 4.4 | 3.3 | 4.4 | 4.4 | 7.8 | **24.3** |
| HV switches, earth switches & isolators | - | 3.4 | 4.3 | 4.3 | 4.4 | **16.4** |
| Power Transformer Replacement 10 MVA | - | - | 3.1 | 3.1 | 3.2 | **9.4** |
| Power Transformer Replacement 20 MVA | 4.4 | 4.4 | - | - | - | **8.7** |
| PT Bushing | 1.0 | 1.0 | 1.5 | 1.6 | 1.6 | **6.7** |
| **Total** | **9.8** | **12.1** | **13.3** | **13.5** | **16.9** | **65.6** |

*Source: EMCa table, derived from AusNet SCS capex model*

272. These projects are in addition to the zone substation rebuild program and are a subset of the substation plant replacement proposed for the next RCP of $71.9 million.

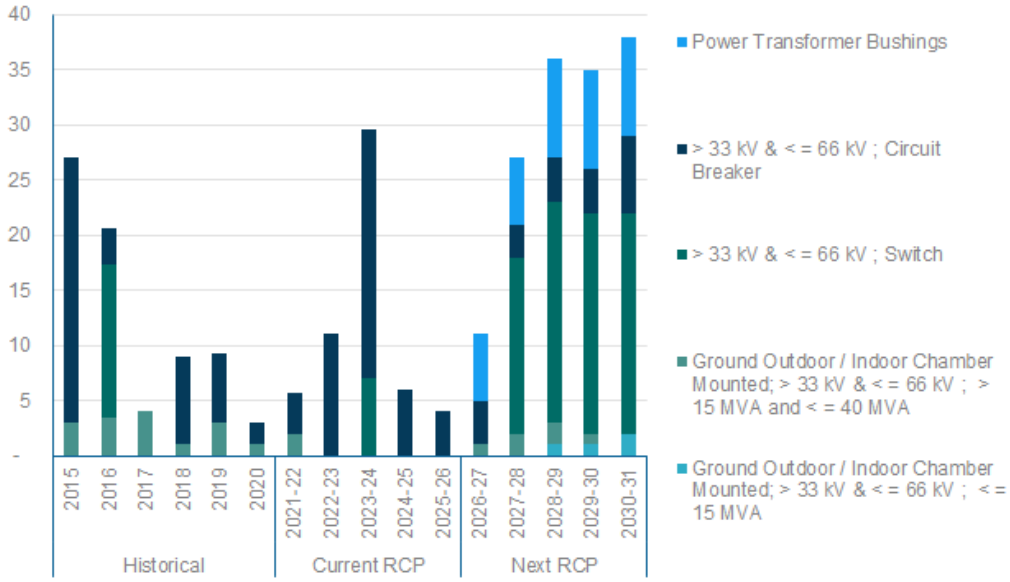
273. AusNet states that the proposed substation plant repex is around 70% higher than the expected capex of $42 million during the current RCP, excluding the costs associated with the substation rebuild program. When combined, the total proposed repex for substation rebuilds and substation plant is around $13 million higher than for the current RCP. AusNet considers that this increase is consistent with global cost pressures that have increased the cost of primary plant items in recent years.

### Assessment

#### Increase in rate of replacement when compared with RIN

274. In Figure 3.4, we show the relevant line items from the RIN which show a step increase in replacement volumes for the relevant asset categories associated with the Plant projects for the next RCP. This is an approximation only as we do not have the allocation between AusNet's projects and the RIN asset categories.

*Figure 3.4: Historical and forecast replacement volumes for plant related RIN asset categories*

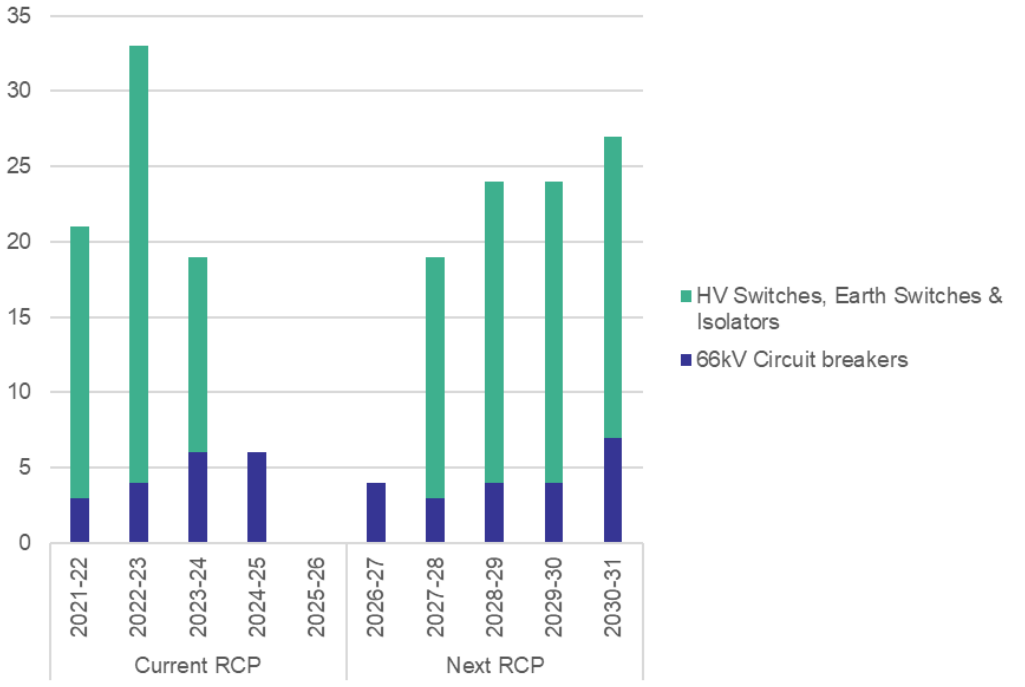



*Source: EMCa derived from RIN data*

275. We asked AusNet to provide historical replacement levels for HV switches and circuit breakers, which is shown in Figure 3.5. There is a marked difference in the presentation of the magnitude and timing of the historical volumes for the relevant categories in Figure 3.4 and Figure 3.5. Some of the differences may be explained by:

- Construction versus commissioning times, which may impact the reporting year. and
- Inclusion of a proportion of other voltage switches, or other assets.

*Figure 3.5: Historical and forecast replacement volumes for HV switches and circuit breakers*




*Source: EMCa derived from IR020*

276. As a substation plant item, the replacement rates or volumes are not a function of historical replacement rates but rather in response to condition-based factors. This analysis serves only to establish that AusNet has a history of replacements across its substation fleet.

### Methodology for calculation of risk for power transformers and circuit breakers is reasonable

277. AusNet conducts economic analysis for its proposed power transformers and circuit breaker replacements:

- Power Transformers:
  - Failure data is used for Weibull analysis to determine Probability of Failure (PoF). The year 1 PoF is based on a health score methodology following CIGRE Technical Brochure 761 in which the health score is related to a PoF using a health index-based Weibull distribution
  - For the total predicted replacements model, year 1 is then turned into a modelling age by placing the health score based PoF onto the age-based Weibull Distribution and finding the corresponding modelling age. The PoF is then predicted in the future by increasing the modelling age year on year, and
- Circuit Breakers:
  - AusNet uses its Machine Learning model (ARM) and industry standard parameters to determine Probability of Failure (PoF). The year 1 PoF is determined by the ARM and is then predicted into the future by a Weibull distribution using industry standard parameters.

278. We understand failure probabilities are similarly developed for instrument transformers; however this was beyond our scope of review.

279. The adopted Weibull values are shown in Table 3.12 and which we consider are within a reasonable range of values expected.

*Table 3.12: Summary of Weibull values for primary plant*

| Asset Type | Beta | Eta | Source |
|---|---|---|---|
| 66kV Circuit breakers | 3.6 | 55 | *Industry Standard* |
| 22kV Circuit breakers | 3.6 | 65 | *Industry Standard* |
| Power transformers | 3.14 | 94.54 | *AusNet failure data* |
| Power transformer bushings | 3.08 | 50 | *unknown* |

*Source: EMCa derived from AusNet economic models for each asset class*

280. Whilst we consider that the parameters for bushing replacement are within a reasonable range, the derivation of these values has not been provided, nor has AusNet provided information on the extent to which these values align with observed experience across the industry or AusNet's network.

### Proposed replacement program likely to be overestimated

281. The project timing (investment year) is nominated as being the first year when the PV of the future benefits exceeds the PV of the future costs, if the project was undertaken in that year. As discussed in section 2, we consider that adoption of this modelling approach is biased towards including interventions prematurely and therefore over-estimating the extent to which such interventions are economically justified within the period.

### Proposed replacement volume indicated by the models are higher than included in the forecast

282. The number of replacements indicate by AusNet's modelling include:

- 24 power transformers
- 32 66kV circuit breakers
- 92 switches, and
- 63 power transformer bushings.

283. These volumes are in excess of the volumes indicated in AusNet's submission, of 5, 22, 76 and 39 respectively, and which we understand were before the post-model adjustments had been applied.

### Post model adjustments have been applied to remove projects

284. Following identification of the number of replacements, AusNet undertakes post model adjustments to remove projects that have been previously completed or in-progress, included in other projects or other factors (data issues, technical ok). No post model adjustments appear to have been made for transformer bushings.

285. We summarise the number of replacements and post model adjustments in Table 3.13.

*Table 3.13: Summary of modelled and post-model adjustments for plant replacement*

| Plant | Forecasting method | Modelled replacements | Post model adjustments | Proposed replacements |
|---|---|---|---|---|
| Power Transformer Replacement | Weibull analysis derived from health score | 24 | -19 | 5 |
| 66kV Circuit breakers | Weibull analysis using industry parameters | 32 | -10 | 22 |
| HV switches, earth switches & isolators | Replaced at same time as CB or CT[52] | 92 | -16 | 76 |

*Source: EMCa derived from models*

286. After post model adjustments, the volumes align with AusNet's submission.

287. For the transformer bushing replacement program, AusNet includes a single reference in its asset management strategy to continue risk-based replacements of transformer, regulators and bushings, based on probability of failure and consequence of failure.[53]

288. We reviewed the model provided with the submission which follows the same process applied for other plant items to determine the number of replacements. From our reading of the model[54] for bushing replacement, we identified 63 power transformer bushings to be replaced between years 3 and 7.

289. These appear to be made up of 39 oil impregnated paper bushings and 24 synthetic resin bonded paper bushings. Assuming that AusNet is targeting the oil impregnated paper bushings in the next RCP, the total would align with AusNet's proposed total of 39 bushings for replacement.

290. The age of the bushings identified for replacement varied from 17 years to 38 years. We have not been provided information pertaining to the historical number of failures, defects or

52 Review of the forecasting method for CTs is beyond our scope of review

53 ASD – AusNet – AMD 20-71 PT and Station Regulators – 31012025 - CONF

54 ASD - Power Transformer Bushing - Economic model (Demo)-31 Jan 2025 - CONF

general condition of the transformer bushings to review, or to verify the Weibull parameters that AusNet has relied upon in determining the replacement volumes.

### Switch replacements are based on dependant primary plant and not condition

291. For switches, earth switches and isolators, AusNet states that:

> *'we do not have a separate economic assessment for HV Switches, Earth Switches & Isolators because the need is due to supporting circuit breakers and current transformers and the required volume is driven by the volume of circuit breakers and current transformers. It is industry standard to not assess the need for HV Switches, Earth Switches & Isolators on its own.'*[55]

292. We sought to understand the relationship, if any, between the proposed volume of switches proposed to be replaced and the volume that may be indicated from a condition assessment of the switches.

293. Based on the HV switches, disconnectors and earth switches model provided with the submission, which does purport to model the PoF and HI, indicates only 2 switches are NPV positive within the band of year 2 (2027) to 7 (2032) which we understand that AusNet has flagged as being positive within the next RCP.

294. In response to our information request, we were directed to an alternate forecasting model, stating that:

> *'The HV Switches, Earth Switches and Isolators in the circuit breaker ZS model (previously provided) was a mistake.'*[56]

295. The model provided with IR020 nominates the replacements shown in Table 3.14. This was a function of the number of CB and CTs, multiplied by 2 assuming a HV switch on either side of these assets. Based on the proposed CB and CT replacements, AusNet's forecast for switches replacement is made up of like for like replacement totalling 76, however it reflects a change in timing from the model.

*Table 3.14: Summary of switch replacements*

| | 2026/27 | 2027/28 | 2028/29 | 2029/30 | 2030/31 | Sum |
|---|---|---|---|---|---|---|
| 66kV Circuit breakers | 4 | 3 | 4 | 4 | 7 | 22 |
| CTs | 0 | 4 | 4 | 4 | 4 | 16 |
| **Total CB and CTs** | **4** | **7** | **8** | **8** | **11** | **38** |
| HV SW, Iso, ESW | 8 | 14 | 16 | 16 | 22 | 76 |
| **Submitted numbers HV SW, Iso, ESW** | **-** | **16** | **20** | **20** | **20** | **76** |

*Source: EMCa derived from IR020*

296. Notwithstanding AusNet's policy of replacing the switch at the same time as the CB and instrument transformers, we do not see how AusNet has included the costs and benefits associated with switch replacement in its economic consideration of the program for CB and instrument transformer replacement. Whilst this modelling may support the efficiency of the proposed coincident replacement, the equipment being replaced does not appear to be in a poor condition or exhibiting characteristics of not performing its intended function. Whilst technically sound and presenting other operational benefits, the strategy has not been demonstrated as being efficient or that the composition of the program may in fact be different to what is proposed.

55 AusNet response to IR020

56 AusNet response to IR020

### Timing of switch replacement is dependent on the associated primary plant

297. The year of replacement has been identified based on when the investment in the associated primary plant first becomes NPV positive. AusNet states that its approach recognises the criticality of circuit breakers and current transformers to reliable supply and the customer outage and network risk impacts of an unplanned asset failure.

298. Accordingly, if the timing of the associated primary plant was deferred the switch replacement would be deferred.

### Analysis is reliant on unserved energy calculations

299. AusNet's modelling relies on inputs such as demand and VCR. As undertaken for the substation rebuild projects, we tested the sensitivity of the projects to changes in VCR assumptions. Unlike the substation rebuild projects, the models did not have a way to test the sensitivity to changes in input assumptions.

300. A single consequence value is included in the data used for the NPV analysis. Whilst worksheets are provided that explain the derivation of the customer, environment and safety COF these do not feed into the values used for the NPV in these models. We do observe large safety consequence, consistent with the potential safety risk posed by failure of transformer bushings as outlined in the AMS document, and for other sites large customer consequences.

301. For the included transformer projects, we recalculated the VCR based on the AER 2024 VCR study. We determined that the VCR reduced by between 23% and 38% relative to the value assumed by AusNet.

*Table 3.15: Comparison of VCR assumption*

| | BDL | MFA | LGA | SLE |
|---|---|---|---|---|
| **Customer type** | | | | |
| Residential | 46% | 22% | 27% | 37% |
| Agricultural | 7% | 30% | 19% | 15% |
| Commercial | 39% | 19% | 32% | 36% |
| Industrial | 8% | 29% | 22% | 12% |
| Total | 100% | 100% | 100% | 100% |
| **VCR ($/kWh)** | | | | |
| ASD assumption | 52.5 | 54.3 | 53.8 | 52.5 |
| 2019 study | 42.2 | 51.8 | 49.8 | 45.2 |
| 2024 study | 40.2 | 33.7 | 35.8 | 37.9 |
| Reduction in VCR of 2024 study relative to ASD assumption | 23% | 38% | 33% | 28% |

*Source: EMCa derived from IR020*

### Timing for some projects is sensitive to changes in VCR, and results in deferral beyond next RCP

302. The program of replacement, particularly transformers was back ended for the next RCP, and we therefore sought to understand how sensitive the program was to changes to input assumptions.

303. As a simplification, we reduced the gross benefits for power transformer replacement by 25% noting that not all benefits would arise from unserved energy. We found that all projects were deferred by around 2 years, and three projects planned to be completed at the end of the period, were deferred to beyond the end of the next RCP.

304. For other items of plant, other sources of benefits were higher (e.g. safety) and a simplifying assumption could not apply in the same way. Nonetheless we consider that application of a revised VCR would result in a reduction to the customer CoF. The model does not allow for sensitivity analysis to test the impact of this assumption, and which we consider may result in deferral of some of the projects based on economic analysis.

### Unit rates are elevated due to included scope items

305. Some of the unit rates for substation replacement appears high as shown in Table 3.16. On review the unit rate includes the replacement of secondary systems. It is not clear the extent that this work may overlap with the replacement of secondary systems for substation sites. However, based on AusNet's process of removing projects we consider that the likelihood is low.

### Unit rates include a risk allowance

306. In response to our information requests, AusNet provided its derivation of a number of key substation unit rates. In addition to the above observations, we note that

- Project management allowance is included at around 15%
- ISP site establishment costs (which we assume are costs imposed by its delivery partners not included in the base estimate) of 20-25%, and in other places sub-contractor indirect costs of 10%, and
- Risk allowance of 8% is generally included.

307. The cost estimation methodology provided by AusNet outlines the cost estimation process, including the cost components. We note that the risk allowance is based on a risk methodology, however the evidence provided to support the unit costs above suggests that this is applied as a standard rate.

308. In response to our information request, AusNet provided a unit rate derivation worksheet[57] which we recognised as being used for a number of its plant and substation rebuild projects. We show the cost estimates relied upon in Table 3.17.

[redacted]

309. In Table 3.18 we show the cost build-up for a transformer, and which reflects the typical cost build-up for other plant items. Some items of plant have a greater amount of detail, and as introduced earlier, include additional allowances to account for known uncertainties in the cost estimate.

[redacted]

310. Risk allowances varied from 7.5 to 8% of the sub-total of project direct cost estimate across different plant items.

311. Assuming that the estimates are presented on the same dollar basis, we observe a material increase in costs from 2019 to 2024. The risk allowances included in the cost estimate marked as 2019 for transformers was 7.5%.

### Findings

312. We consider that the proposed repex for substation plant is materially overstated.

57 AusNet - Discrete project unit rate derivations_CONF provided with IR009

58 Sub-total introduced to assist with presentation

313. The methodology for calculation of risk is in general sound, however we are concerned that the modelling methods employed by AusNet lead to an overstatement of the required replacement levels. Notwithstanding the top-down adjustments applied by AusNet, the selection of a program in the first year that the analysis is NPV positive is not indicative of the justified economic timing.

314. We found some projects very sensitive to the input assumptions that AusNet had applied, and when adopting more reasonable inputs this resulted in deferral of some projects beyond next RCP.

315. We found examples of what we considered high unit rates, and on further investigation found these rates inclusive of an unwarranted risk allowance. Whilst provided for with its cost estimation methodology, we found these applied as a percentage of the total project costs. When reviewed over a sample of discrete projects we found that the estimated actual costs were lower than the P50 estimated costs, and which calls into question the application of the risk allowance for these projects.

### 3.3.3 Switches & other

#### What AusNet has proposed

316. AusNet has included replacement of control boxes in its switches & other program at a total estimated cost of $43.2 million as shown in Table 3.19.

*Table 3.19: AusNet proposed for switches & other repex - $m, real FY2026*

| Switches & Other | 2026-27 | 2027-28 | 2028-29 | 2029-30 | 2030-31 | Total |
|---|---|---|---|---|---|---|
| Control Boxes | 4.0 | 7.8 | 8.6 | 11.2 | 11.6 | **43.2** |

*Source: EMCa table, derived from AusNet SCS capex model*

317. Control boxes provide automatic and remote operations of automatic circuit reclosers (ACRs) and automatic gas switches. AusNet state that approximately half of its fleet is over 10 years old, and Weibull analysis undertaken by AusNet indicates a significant increase in failure rates beyond this age.

318. AusNet has identified 959 control box units to be replaced over the next RCP based on its modelling. The year of replacement has been identified based on when the investment first becomes NPV positive and is therefore claimed to be economic to replace during the next RCP.

319. AusNet has not made any post model adjustments to this project.

#### Updated proposal

##### Unit rates for replacement of control boxes are typical of an ACR replacement

320. Based on the proposed replacement volume and expenditure, the average unit rate for control box replacement is approximately [redacted] ($2026). We consider that this cost is similar to the cost of an ACR, rather than its control box and overstates the required expenditure, assuming the need is justified.

321. We reviewed the unit rate information provided by AusNet with its submission and identified the unit cost assumed for the control box replacement was [redacted] ($2024) and for the ACR replacement was [redacted] However, the unit rate for an ACR is indicated as [redacted] ($2024) per switch.

322. We have not been asked to consider the ACR replacement program, however the unit rate applied for the program appears to be inconsistent with AusNet's own unit rate assumptions. Also, the unit rate for control box replacement is similar to the ACR replacement, whereas it should be much less as no primary plant is replaced.

### AusNet has corrected an error with its unit rates

323. In response to our information request, AusNet recognised an issue with the application of unit rates for this project and adjusted the proposed expenditure. This resulted in a reduction of approximately $6 million:

> *'AusNet has identified that the unit rates used for control boxes was incorrect and we are providing an updated response for question 11 that reflects the correct values. We are also attaching an updated SCS capex model reflecting this change which reduces the AusNet repex forecast by about $6m. I have updated the response documents on our share [sic] and attached the updated capex model to this email.'*[59]

324. The forecast repex, after AusNet's adjustment of unit rates is shown in Table 3.20, and produces a unit rate of approximately [redacted] per unit. We consider that this is still at the high end of a reasonable range for replacement of a control box.

*Table 3.20: AusNet proposed for switches & other repex - $m, real FY2026*

| Switches & Other | 2026-27 | 2027-28 | 2028-29 | 2029-30 | 2030-31 | Total |
|---|---|---|---|---|---|---|
| 39. Control Boxes | 6.3 | 4.6 | 3.1 | 1.7 | 2.0 | **17.8** |

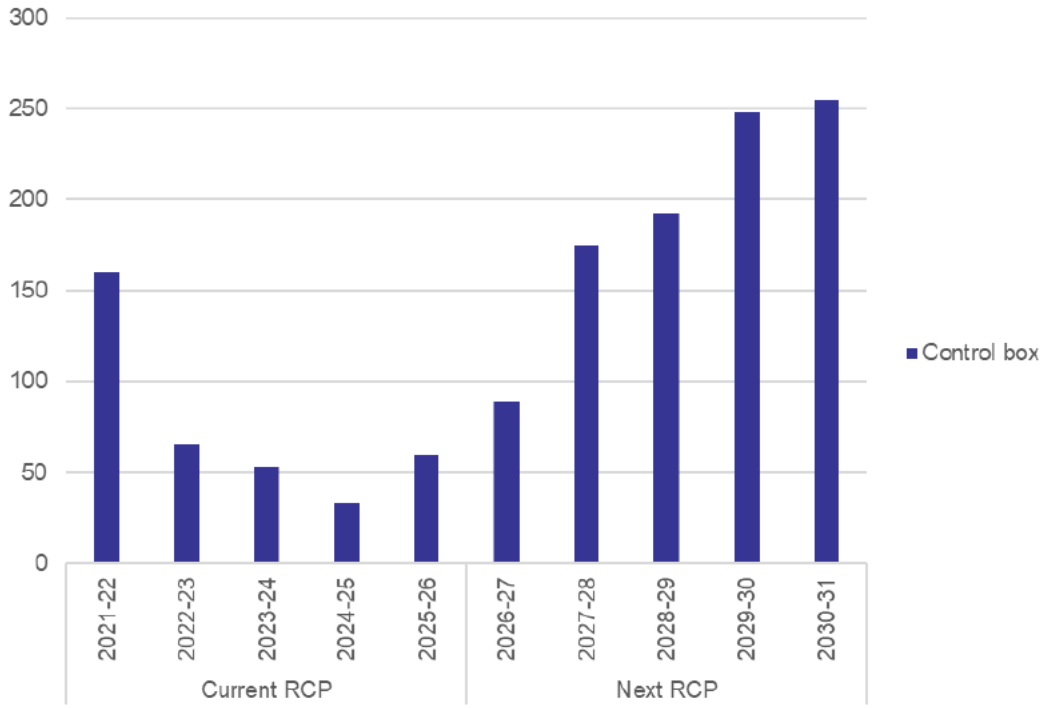
*Source: EMCa table, derived from IR020 updated SCS model (ASD - AusNet EDPR 2026-31 – SCS Capex Model – Update - 16052025)*

## Assessment

### AusNet has been replacing control boxes at a lower rate than is proposed

325. We asked AusNet to indicate the historical and planned replacement volumes, as we understood this was a newly introduced program. The volumes along with the forecast are shown in Figure 3.6. We can see an acceleration of volumes, from those undertaken in 2024-25.

*Figure 3.6: historical and forecast replacement volumes*




[59] AusNet response to IR020

*Source: EMCa derived from IR020 and replacement and safety programs – cost build-up*

### Economic analysis tends to overstate the justifiable size of the program

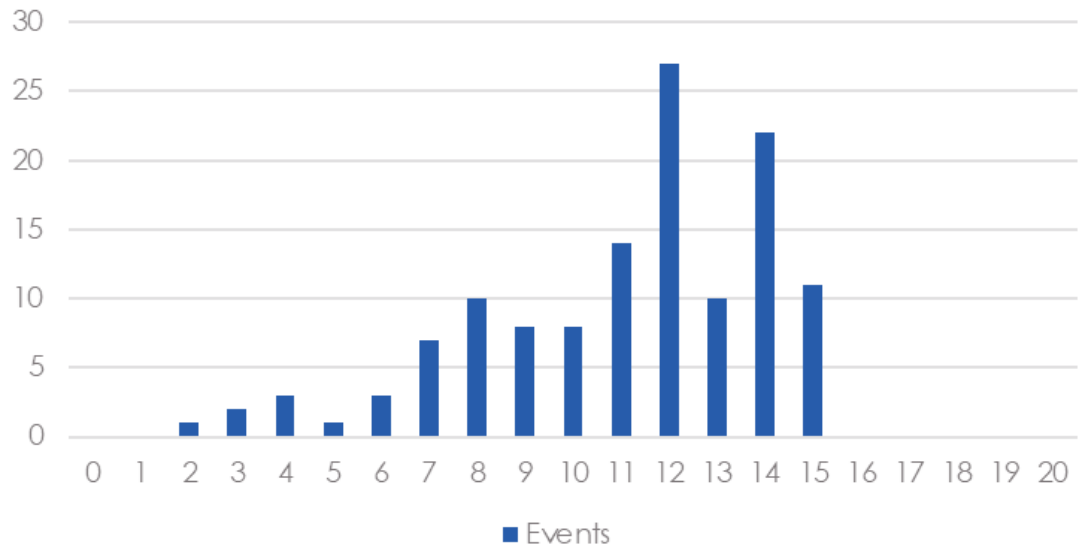
326. AusNet has applied what it considers industry standard parameters to determine the Probability of Failure (PoF) of its fleet of control boxes using a Weibull distribution. The Weibull parameters include a shape parameter of 1.78 and scale parameter of 14.3. However, as explained below the derivation of these values, and reasonableness of their application to control boxes has not been demonstrated.

327. As has been introduced for other asset groups, AusNet determines the project timing (investment year) as being the first year when the PV of the future benefits exceeds the PV of the future costs, if the project was undertaken in that year. As discussed in section 2, we consider that adoption of this modelling approach is biased towards including interventions prematurely and therefore over-estimating the extent to which such interventions are economically justified within the period.

### The distribution of failure events is wide, but low in number

328. We show the distribution of failure events recorded by AusNet by age in Figure 3.7. The figure shows that the failures have occurred between 2 and 15 years.

*Figure 3.7: Failure events versus age of control box*




*Source: EMCa derived from control box model*

329. From this information, AusNet has determined a mean failure age of 11 years. However, there is insufficient information provided to determine that the control boxes would follow a standard wear out curve, or whether the parameters adopted by AusNet are reasonable.

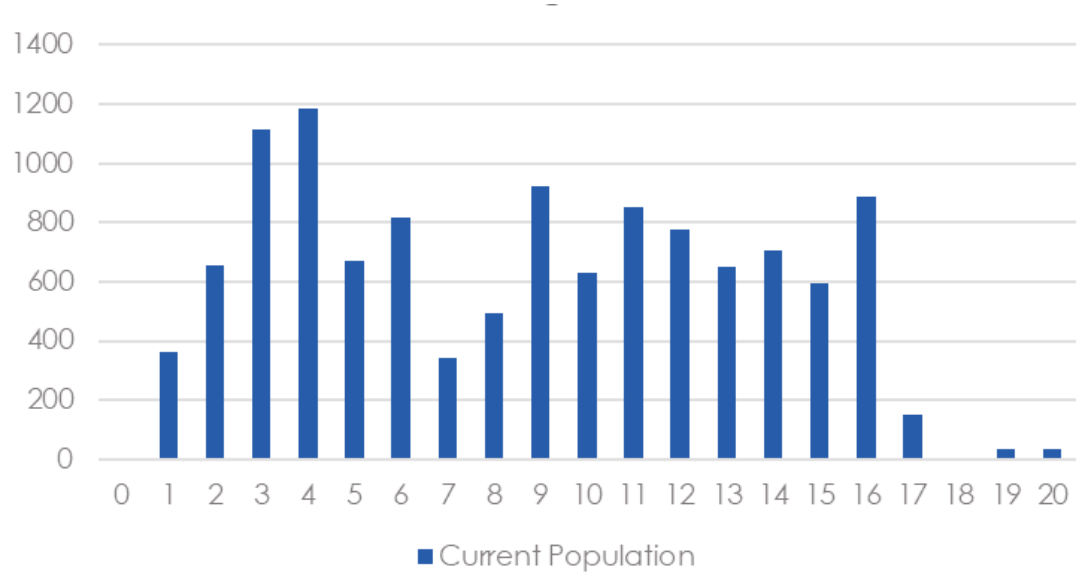
### Absence of root cause analysis of the failures

330. From the event information, there appears to be a range of ages at which failure occurs, and without undertaking a root cause analysis, this may indicate a wide array of solutions including repair / replacement of components, improved mechanical / weather / vermin protection and or enhanced maintenance practices.

### Assuming a low failure age suggests that a large population of assets are at risk of failure

331. Of the 11,936 units included in its model, the age profile is indicated in Figure 3.8 with 3,892 control boxes above 11 years.

*Figure 3.8: Age of population of control boxes*




*Source: EMCa derived from control box model*

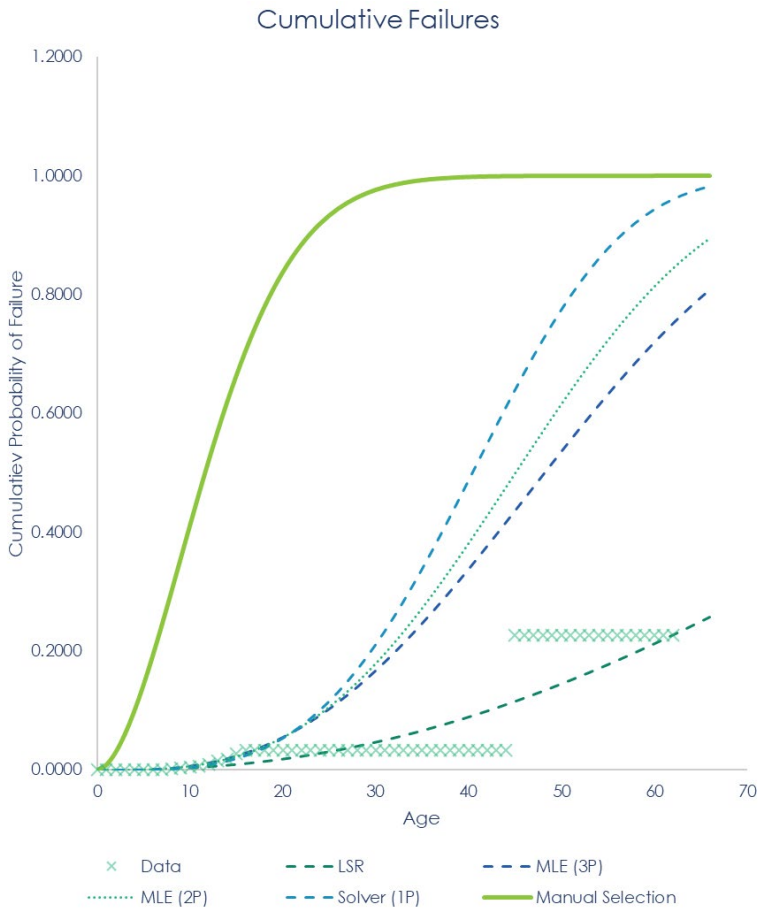
332. With an average number of historical annual failures rate of 26, the failure rate of 0.2% across the population p.a. appears low. It is not clear whether the modelling has been calibrated against failure observations as the predicted failures of 980 p.a. (and 4901 over the next RCP) appears high, and likely to overstate the replacement volume that AusNet will undertake.

333. It doesn't appear that these assumptions have been adequately tested by observed failure data, or modes of failure.

### As a result, AusNet has modelled an aggressive failure rate

334. As shown in Figure 3.9, the adopted Weibull parameters result in a much steeper failure rate than the failure data would indicate. The Weibull predictions indicate 980 failures pa, which compares with the historical failures of 26 p.a.

*Figure 3.9: Curve fit of failure data*




*Source: EMCa IR#020 Control Boxes*

335. Whilst these parameters had the highest correlation of the methods reviewed by AusNet, other methods tended to converge on values of a predicted number of failures of 26 and predicted failures in next period of 220, and which aligns more closely to the observed data.

## The benefits applied to determine the replacement yar are driven by the calculation of the value of unserved energy

336. The CoF is expressed as:

*Figure 3.10: Consequence of failure equation*

$$CoF = \%_{coinc\ line\ fault} \times \frac{ZSS\ output}{ZSS\ section\ count} \times (Feeder\ section\ count \times T2_{duration} + 2 \times T3_{duration}) \times VCR \times 1000$$

*Source: EMCa IR#020 Control Boxes*

337. In this equation, there is recognition that failure of a control box will not result in loss of supply. AusNet describes the relationship of a failed control box to customer impact as:

> *'A failed asset in isolation will not impact the customer.*
>
> *An impact will only be realised if another fault in the line has occurred at the same time, which then required these assets to 'activate'. This event trees assumes conductor and cable failures to be representative of those line faults.'*[60]

[60] AMS 01-09-02 - Event Trees, page 14

338. AusNet has introduced a likelihood of a coincident line fault at the time of control box failure of 1.52% to calculate unserved energy. However, the calculation is not transparent in the model we have been provided.

339. As with the plant replacement, the VCR values assumed by AusNet are higher than indicated by the AER 2024 study. The model does not allow for these values to be changed, but if changed we expect that this would result in reductions to the size of the proposed program.

#### Findings

340. AusNet has not sufficiently demonstrated a need for the step increase that it has proposed for its control box replacement program, or that the option to replace the control boxes represents a prudent and efficient option.

341. Notwithstanding the potential need identified by AusNet to continue to replace some of its control box fleet, as it has done historically, we find:

- inadequate options analysis to align with other programs such as replacement of the primary equipment, or component replacement to extend the asset lives that responds to a root-cause analysis, and
- Insufficient basis for the failure rate that has been assumed, cause of failure or relevance of the 'industry standard rates' applied to its Weibull analysis, and which leads to an overstatement of the replacement requirements being an increase of more than 2.5x from 371 to 959.

342. We consider that AusNet has proposed a material overstatement of the required repex for control boxes.

### 3.3.4 Substation protection and control

#### What AusNet has proposed

343. AusNet has included three substation protection projects for the next RCP including two in-flight projects at a total estimated cost of $75.4 million as shown in Table 3.21.

*Table 3.21: AusNet proposed for substation protection repex - $m, real FY2026*

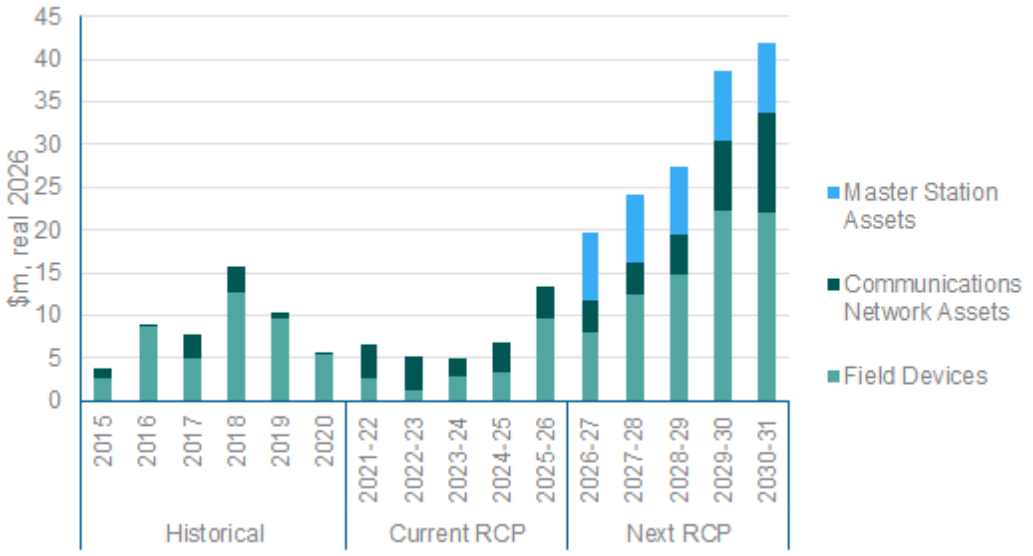
| Substation Protection | 2026-27 | 2027-28 | 2028-29 | 2029-30 | 2030-31 | Total |
|---|---|---|---|---|---|---|
| Aux Supply | 3.9 | 5.2 | 5.3 | 5.3 | 6.7 | **26.4** |
| Protection & Control Replacements | 5.3 | 8.0 | 9.4 | 12.2 | 12.3 | **47.1** |
| RTU | 0.9 | 0.0 | 0.0 | 0.9 | 0.0 | **1.9** |
| **Total** | **10.2** | **13.2** | **14.6** | **18.4** | **19.0** | **75.4** |

*Source: EMCa table, derived from AusNet SCS capex model*

344. AusNet states that the aim of this program is to manage risk associated with ageing protection and control assets through targeted, proactive replacement of high risk, poor condition or obsolete assets that are past their technical service life.

345. In Figure 3.11 we present the historical and forecast expenditure for the SCADA, network control and protection RIN asset group. We understand that this asset group includes a proportion of expenditure associated with substation rebuild projects, in addition to dedicated protection and control projects.

*Figure 3.11: Comparison of historical and forecast SCADA, network control and protection repex - $m, FY2026*




*Source; EMCa derived from RIN*

346. We observe a material step increase in expenditure commencing in the final year of the current RCP.

### Assessment

#### AusNet has included replacement of a collection of secondary equipment

347. AusNet has included proposed replacement of:

- 175 protection relays, including electromechanical relays and first-generation electronic and microprocessor-based relays in poor condition, obsolete and present technical operation deficiencies, and
- 20 DC supply system upgrades, where batteries and associated systems are in poor condition and present increased risk to security and availability of supply.

348. In addition, AusNet has proposed a small number of RTU replacements.

349. AusNet typically aims to complete secondary asset replacements at the same time as primary asset renewal, refurbishment or augmentation works.

#### Projects identified by combination of economic assessment and technical factors

350. The main drivers for identification of the replacement projects are:

- NPV is positive
- For Battery systems: when the age of the DC battery within aux supply is greater than 15 years old and nearing end of life, or there are notifications on battery (reactive maintenance) which indicating battery condition is deteriorating, and
- For protection relays and RTUs: obsolete relays which are no longer manufactured, not supported by suppliers and a shortage of skilled resource to maintain, or aging relays which exhibit unexpected operation or have limited capability which do not meet current network condition e.g. voltage regulation relay which does not provide reverse power flow capability.

351. In addition, priorities for replacement include:

- Single Auxiliary Supply System at Zone Substation (ZSS) is prioritised for replacement, and
- Transformers, 66kV lines, buses, master earth fault, backup earth fault, voltage regulation and feeder protection relays are prioritised for replacement.

### Industry standard PoF parameters have been adopted

352. The economic analysis undertaken by AusNet has adopted industry standard parameters to determine the Probability of Failure (PoF). The year 1 PoF is based on an age-based Weibull distribution which is then predicted into the future using the same distribution.

*Table 3.22: Weibull parameters for secondary assets*

| Group | beta | eta |
|---|---|---|
| Protection & Control Replacements | 3.5 | 45 |
| RTU | 3.5 | 45 |
| AUX Supply | 3.5 | 45 |

*Source: IR020*

353. AusNet has included three types of consequence – expected unserved energy, environmental risks and safety risks. As noted earlier in our report, the CoF based on the event tree analysis looks reasonable. However, AusNet appears to have adopted a simplifying assumption that all protection and control devices located at each substation have common CoF to that substation, independent of their function.

### Program likely to be overstated

354. AusNet calculates the replacement year for each protection & Control asset as the first year when the present value of the avoided risk benefit exceeds the present value of replacement. If the replacement year falls within the next RCP (indicated as between years 3 and 7 of the model), then it forms a part of the proposed replacement volume.

355. The model outputs are indicated in Table 3.23.

*Table 3.23: Summary of model outputs for protection and control replacements*

| | Modelled year | | | | | | |
|---|---|---|---|---|---|---|---|
| Model Outputs | 3 | 4 | 5 | 6 | 7 | Total | Population |
| Protection & Control Replacements | 26 | 117 | 10 | 54 | 39 | 246 | 3,480 |
| Aux Supply | 6 | 14 | 16 | 14 | 17 | 67 | 162 |
| RTU | 1 | 0 | 0 | 1 | 0 | 2 | 100 |

*Source: IR020 Protection & control model*

356. We consider that a positive NPV is an indicator of the timing, and not necessarily a determination of the point at which the NPV is maximised for a single project or portfolio of projects, or when subject to reasonable sensitivity analysis. To rely on this type of analysis is likely to result in a higher program than is efficient.

### Post model adjustments have been applied

357. AusNet has applied post model adjustments to its modelled outcome to remove projects that are in delivery or already completed, packaged as a part of a ZSS rebuild, or other factors (data issues, technical ok).

358. For example, the modelling identified 67 auxiliary supply replacement projects. After adjustments for devices that were (i) in delivery, (ii) already replaced, battery charger or planned for substation rebuild reduced the number to 15. Then, AusNet added back 5 due to Morwell North and Morwell West Zone Substations because they have been deferred from the current period to the 2026-31 period (a total of 20 once post modelling adjustments have been accounted for). We show the revised numbers in Table 3.24.

*Table 3.24: Final outputs (adjusted and smoothed)*

| Program | Modelled year 3 | 4 | 5 | 6 | 7 | Total |
|---|---|---|---|---|---|---|
| Protection & Control Replacements | 20 | 30 | 35 | 45 | 45 | 175 |
| RTU | 1 | 0 | 0 | 1 | 0 | 2 |
| AUX Supply | 3 | 4 | 4 | 4 | 5 | 20 |

*Source: IR020 Protection & control model*

### Unit rates appear high

359. We were not provided with the details of the scope, or list of individual devices that are being targeted for replacement beyond the equipment numbers. Whilst the unit costs appear similar to those included in the unit rates document, at [redacted] for a protection relay replacement, [redacted] for RTU replacement and [redacted] for auxiliary supply replacement, they appear high.

360. Based on our analysis included in our assessment of substation plant, we consider the same issues are present for projects in this asset group.

### Findings

361. We consider that AusNet's proposed SCADA, network control and protection repex is overstated.

362. We consider that a combination of the modelling methods, input assumptions and unit rates has contributed to a forecast that is higher than a prudent and efficient program, as was the case in our assessment of substation plant.

## 3.3.5 Poles

### What AusNet has proposed

363. AusNet has proposed pole replacement and reinforcement of $212.5 million as shown in Table 3.25.

*Table 3.25: AusNet proposed for poles repex - $m, real FY2026*

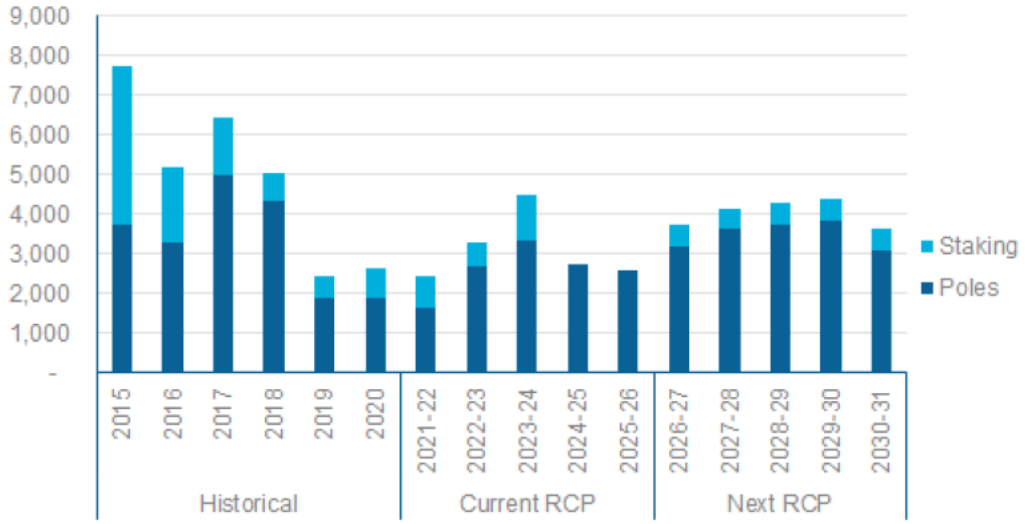
| Poles | 2026-27 | 2027-28 | 2028-29 | 2029-30 | 2030-31 | Total |
|---|---|---|---|---|---|---|
| HV complex 148HVC | 7.1 | 7.1 | 7.2 | 7.3 | 7.4 | 36.1 |
| HV simple 148HVS | 18.3 | 18.0 | 17.7 | 17.4 | 17.2 | **88.6** |
| LV 148LVP | 12.5 | 12.2 | 11.9 | 11.7 | 11.5 | **59.8** |
| Dist. poles - street lights 148SIM | 1.5 | 1.6 | 1.7 | 1.8 | 1.9 | **8.5** |
| Reinforcement 149FWK | 0.7 | 0.7 | 0.7 | 0.7 | 0.8 | **3.6** |
| Sub-trans. poles - complex 147COM | 0.1 | 0.2 | 0.2 | 0.2 | 0.2 | **0.8** |
| Sub-trans. poles - simple 147SIM | 2.9 | 2.9 | 3.0 | 3.0 | 3.1 | **15.0** |
| **Total** | **43.2** | **42.7** | **42.3** | **42.2** | **42.0** | **212.5** |

*Source: EMCa table, derived from AusNet SCS capex model*

### RIN data indicates a higher volume of pole replacements, due to addition of resilience program

364. The pole intervention volume recorded in the RIN is shown in Figure 3.12.

*Figure 3.12: Comparison of historical and forecast pole intervention volume*




*Source: EMCa table, derived from RIN*

365. Figure 3.12 shows the total pole interventions recorded in the RIN, which increase from 15,570 to 20,211 from the current RCP to the next RCP. The intervention profile increases from 2021-22 for two years before reducing for 2024-25. A step increase is observed from 2026-27 which we understand is primarily due to the introduction of additional programs, such as resilience.

366. The reason for the increase observed in 2023-24 is not explained by AusNet.

367. When the resilience program is included, including pole hardening, the proposed pole interventions are materially higher than the 10% increase from the current period.

### Assessment

#### AusNet is forecasting an increase to its pole management program

368. For its asset replacement program, AusNet states in its regulatory proposal:

> *'Reflecting the ageing wood pole fleet and subsequently its deteriorating asset condition, we are forecasting an increase of 10% in total pole replacement and reinforcement volumes, from approximately 15,400 in the current regulatory period to around 16,900 in 2026-31.'*[61]

369. Table 3.26 shows the volumes included in the replacement and safety programs workbook relating to the replacement program only (excluding other programs such as resilience).

*Table 3.26: AusNet proposed pole intervention volumes*

| Poles | 2026-27 | 2027-28 | 2028-29 | 2029-30 | 2030-31 | Total |
|---|---|---|---|---|---|---|
| Distribution poles | 2,786 | 2,747 | 2,710 | 2,677 | 2,648 | **13,568** |
| Sub-transmission poles | 125 | 127 | 129 | 129 | 130 | **640** |
| Staking | 515 | 531 | 546 | 560 | 573 | **2,725** |
| **Total** | 3,426 | 3,405 | 3,385 | 3,366 | 3,351 | **16,933** |

*Source: EMCa table, derived from Repex and safety program worksheet*

370. We observe the increases described by AusNet, with the exception of the higher replacement volumes planned for 2024-25 and 2025-26. According to the asset

[61] AusNet regulatory proposal EDPR 2026-31, page 134

replacement volumes included in the RIN, the volumes in these years are forecast to decrease. We expect this is due in part to reinforcement volumes recorded in the RIN as zero for these years.

### Change in pole inspection frequency may increase poles identified for treatment

371. In its regulatory proposal, AusNet states:

> *'The increase in forecast pole replacement volumes is also driven by a recent change in our wood pole inspection obligations which, effective from January 2024, has decreased the inspection interval from six to five years. All else equal, this will increase the rate at which we find unserviceable poles (the find rate) and lead to an increase in asset replacement volumes. The effects of this change are also reflected in higher replacement volumes planned for 2024-25 and 2025-26.'*[62]

372. As actual pole interventions are based on actual observed / measured condition, rather than a forecast decay model, it follows that wood poles may deteriorate at a different rate than has been modelled. The increase in inspection frequency may result in an increase in the find rate of interventions.

### Volume data inconsistencies in the RIN are not explained

373. We are not able to reconcile the volumes provided in the RIN with the outputs of AusNet's modelling. For example, there are 1,682 distribution poles – streetlights identified in the pole modelling and in the summary of the replacement and safety expenditure. We are therefore satisfied that these are the volumes used to determine the expenditure forecast. However, the RIN total for 1kV steel columns used for distribution poles – streetlights is a lower number (1,622).

374. The pole staking also includes 466 pole reinforcements of streetlight poles, and which needs to be considered in determining long-term trends of average unit rates.

375. We have not sought to reconcile the volume of poles included in the poles asset group, or by each category as there is a large number of poles targeted for the resilience program and which is beyond the scope of our review.

### Pole intervention modelling is based on predicted failure volumes and not economic analysis

376. In its expenditure forecasting methodology (section 10.11), AusNet refers to the development of a business case, NPV analysis and options analysis for the proposed expenditure. We were not able to find these documents for the poles forecast in the information that AusNet provided.

377. We were similarly not able to determine the basis for the forecast intervention volumes included in the submission. When discussed during the onsite meeting, AusNet stated that it had provided the incorrect model with the submission. We asked for the correct model.

378. AusNet has provided a workbook that is a representation of its modelling, as it is done in proprietary software. Our review is therefore limited to the process undertaken, and outputs of the modelling by AusNet.

379. In the main we observe a process that seeks to create a predictive model based on observed failures for the asset types, as shown in Table 3.27. We were surprised by the mean failure age recorded against some asset types, particularly concrete and steel poles

62 AusNet regulatory proposal EDPR 2026-31, page 134

which have expected service lives of 60-100 years for concrete[63] and 35-50 years for steel poles.[64]

*Table 3.27: Attributes by pole asset type*

| Pole asset type | Population | Mean failure age |
|---|---|---|
| POLECONC | 135,302 | 32 |
| POLESTEEL | 102,280 | 19 |
| POLEGRP | 2,010 | n/a |
| POLEWOOD serviceable | 155,915 | 49 |
| Staked Pole | 21,788 | 50 |
| POLEWOOD Limited Life | 3,651 | 53 |
| **Total** | **420,946** | **-** |

*Source: IR020 Poles CONF*

380. The mean failure age in AusNet's model also does not appear to correlate with other statements by AusNet, including that the age profile of reinforced wood poles shows an average of 56 years with a standard deviation of 13 years.

381. We were also surprised to see the number failure events recorded against poles with a low age including age of zero and assume this may not represent the natural age as it would indicate a potential issue with early-life failures rather than aged-based deterioration.

### Modelling outcomes do not align

382. In response to our request for information, AusNet explained that the forecast for pole replacement is based on its Weibull analysis to produce the PoF for each pole group. For wood poles with limited life, AusNet '*manually removes the assets not needed for replacement. The outputs for this tab are the Weibull parameters used to calculate the PoF.*'[65]

383. AusNet describes that the pole PoF is calculated based on its corresponding Weibull parameter value, and which reflects its pole type are then summed to determine the expected number of replacements. However, due to the number of replacements, this is undertaken in PowerBI and was not provided to us. Nor can we see the method applied by AusNet to determine the reinforcement levels, which in our view are low compared with ratios applied across industry.

384. We found the summary included in Table 3.28 from a hidden sheet in the model.

*Table 3.28: Allocation of replacement and staked poles*

| | Output[66] | Replacement | Staked |
|---|---|---|---|
| POLECONC | 346.6 | 346.6 | 0 |
| POLESTEEL | 1,621 | 1,621 | 0 |
| STAKED POLE | 7,099.4 | 7,099.4 | 0 |
| POLEWD SERVICEABLE | 9,987.1 | 7,190.7 | 2,796.4 |
| POLE LIMITED LIFE | 107.9 | 77.7 | 30.2 |

63 The ASD asset strategy states 'Currently the technical life for concrete poles has not been determined; however, with the oldest installations approaching 52 years and fewer than ten have been replaced due to deterioration, it is expected to last beyond 60 years and may well achieve a mean service life of 100 years. This will be determined through the ongoing inspection and condition assessment regime and analysis of deterioration and replacement rates.'

64 Estimated to increase to 50 years with improved galvanising

65 IR#020 Q15_Q18_ POLES CONF

66 Replacements - Outputs from KPMG 'Poles_weibullCurveGenerator'

| | Output[66] | Replacement | Staked |
|---|---|---|---|
| POLE GRC | 0 | 0 | 0 |
| **Expected failures** | **19,162.0** | **16,335.4** | **2,826.6** |

*Source: EMCa derived from EMca IR#020 Poles Model*

385. These are higher numbers than the 17,637 poles identified for intervention in the pole summary, however they indicate that the staked poles have been determined by application of a 28% staking ratio for that pole group.

386. In another area of the same worksheet titled '3A. Weibull Analysis results', AusNet has included the following staking assumptions, which indicate a lower staking ratio of 22% for those poles that are able to be reinforced:

- 1. Sub-transmission poles not stakeable
- 2. If pole has already been staked, then replacement only, and
- 3. Apart from point 1 and 2, remaining poles apply 78:22 Replacement vs staking ratio.

### Pole intervention volumes are likely to be similar to historical practice is a reasonable assumption

387. We have not undertaken an independent review of the serviceability assessment for wood poles. We understand that ESV has undertaken a review of wood pole management practices of each of the Victorian DNSPs and made recommendations which have been (or are being) implemented by each of the DNSPs.

388. For forecasting, our focus is on whether AusNet has demonstrated that its forecast of pole interventions is based on reasonable process and assumptions, and more likely than not to reflect an expenditure forecast that meets the capex criteria.

389. AusNet has sought to apply Weibull analysis to its pole population; however the pole population does not deteriorate or fail in a homogeneous manner. AusNet appears to have addressed this by looking at sub-populations, which should improve its analysis. However, the modelling does not consider pole degradation factors, which may change the composition of the pole replacement and reinforcement volumes within a pole population or sub-population.

390. Based on AusNet's condition data, it considers that the poles subject to intervention would exceed those included in its forecast:

> *'approximately 16% of wood poles – approximately 28,800 - are in the poorest condition (C5) and, upon inspection, may require reinforcement or replacement. Again, this is significantly below our proposed volume of wood pole replacements of 13,000.'*[67]

391. Using trending alone, and AusNet's change of inspection frequency to a 5-year interval, we would expect that the intervention may increase relative to historical levels based on extrapolation of the same find rate.

### Streetlighting poles should be removed from SCS forecast

392. We consider that the provision and maintenance of public lighting services includes poles dedicated to the provision of streetlighting, and which is more typically treated as ACS. As discussed above, AusNet has included replacement and reinforcement of steel poles used for this purpose in its forecast SCS repex.

393. We asked AusNet to explain the scope of this project and the rationale for inclusion as SCS rather than ACS. In response, AusNet stated:

> *'This description is used by AusNet to distinguish between overhead powerline poles and residential underground-supplied streetlight steel columns. It specifically pertains to the*

[67] Regulatory proposal, page 133

*poles (columns) themselves and does not include the luminaire, which is maintained, replaced, and treated separately under ACS."*[68]

394. We find that this is inconsistent with the definition of public lighting services, and the treatment applied by AusNet for the current RCP.

395. In its RRP for the current RCP, AusNet removed expenditure associated with steel poles from its forecast repex:

*'..following the submission of our Initial Proposal we amended our forecast to remove expenditure associated with steel poles that were to be used only for public lighting and corrected for an error that resulted in an over-estimation of our poles forecast."*[69]

396. We are not aware of any changes which would change the treatment of this expenditure. We reviewed the Framework and Approach and found no mention of steel poles used for streetlighting.

### Staking ratio is lower than in other networks

397. Based on Table 3.29, the staking rate as a percentage of total distribution pole interventions is approximately 19%.[70] We consider this low compared with industry standard staking rates approaching 40%.

*Table 3.29: Summary of pole replacements and staking volumes*

| Pole description | Sum of Replacement | Sum of Pole staking |
|---|---|---|
| Distribution poles - HV complex 148HVC | 1,331 | 355 |
| Distribution poles - HV simple 148HVS | 6,219 | 1,155 |
| Distribution poles - LV 148LVP | 4,891 | 875 |
| **Sub-total - Distribution poles** | **12,441** | **2,385** |
| Distribution poles - street lights 148SIM | 1,682 | 466 |
| Sub-transmission poles - complex 147COM | 29 | 0 |
| Sub-transmission poles - simple 147SIM | 633 | 0 |
| **Total** | **14,785** | **2,851** |

*Source: EMCa derived from EMca IR#020 Poles Model*

398. Figure 3.13 shows the staking rate as a percentage of total wood poles replaced as recorded in the RIN. This will include poles replaced in response to other drivers, however we expect the volumes associated with the pole replacement program to dominate.

399. We observe historical staking rates[71] averaging around 40% prior to 2024-25. For the next RCP, the staking rate at a total pole level[72] averages 26%. Whilst this average exceeds the wood pole staking rate calculated for the pole intervention program alone, both values are well below the historical staking rate and industry practices. Based on this raw analysis, the forecast reinforcement rates are much lower than AusNet has historically undertaken.

68 AusNet response to IR020

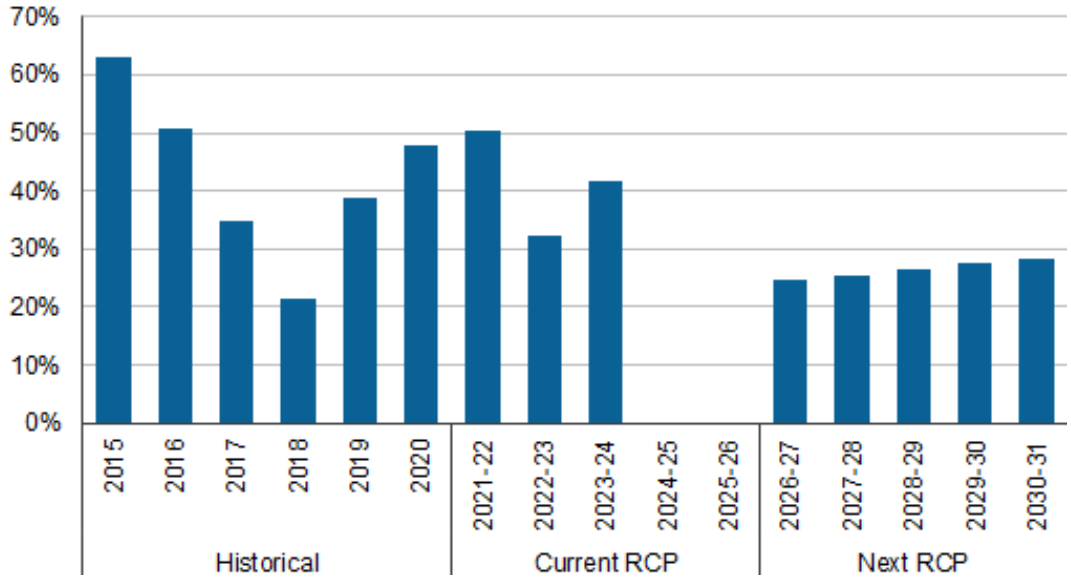
69 AusNet RRP (REVISED REGULATORY PROPOSAL 2022-26 3 DECEMBER 2020 p49)

70 Calculated as 2385 divided by the sum of 12441+2385

71 Calculated as a ratio of pole reinforcements divided by pole interventions (reinforcements + replacements)

72 This includes distr bution wood poles and all staking, inclusive of staking / reinforcement of poles other than wood.

*Figure 3.13: Calculated staking rate*




*Source: EMCa derived from RIN*

400. There may be valid reasons for a lower staking rate, and which include greater use of concrete as alternative to wood due to termites or other environmental conditions, degradation of poles not suitable for reinforcement, higher percentage of replacement of already reinforced poles or policies that prevent reinforcing in some areas (such as highest bushfire risk areas). We observe that AusNet has much lower reinforcing rates than Powercor, which has similar environmental considerations. We have not been provided a compelling reason for this lower staking rate.

### Overlap with other programs has been removed

401. AusNet has applied post model adjustments to its poles forecast based on two criteria:

- Overlap with planned or on going works, and/or
- SME input to determine actual asset condition and need for grouped replacement. T

402. AusNet has determined that the percentage of poles over 65 years in its network is 4.0% and used this as the basis to remove poles in the corresponding project areas.

403. On the modelled outcome of 17,637 interventions, AusNet estimated that 4% or 705 poles would be included in other programs and removed these from this program. The removals were done by:

- 22 direct removal of known sub transmission poles, and
- 683 by application of a proportionate reduction to distribution pole replacement and distribution pole reinforcement (LV and HV).[73]

### Consideration of alternate volumes, or forecasting methods has not been explored

404. In response to our enquiry as to how AusNet has determined the prudent scope and timing of the proposed replacement volume for the next RCP, including by consideration of alternate replacement volumes, it stated:

> *'Proposing a lower volume than we have forecast using this methodology is not a feasible option, as it would be inconsistent with our regulatory and legislative safety obligations relating to pole inspection, and the replacement of unserviceable poles.*

[73] There were no post model adjustments applied to streetlight pole replacement. However streetlight pole reinforcement were included in the total pole reinforcement numbers, subject to the post model adjustment.

*While it is a slight increase on current period actual and planned volumes, we consider our proposed pole replacement volumes to be conservatively low, given the ageing profile of our wood pole fleet'*[74]

405. We consider that the analysis of alternate volumes for intervention, and which may extend to different forecasting methods and/or the impact to risk of higher or lower intervention volumes is a key consideration in demonstrating a prudent and efficient intervention volume.

### Unit costs appear reasonable

406. AusNet has stated that it has been subject to market-driven cost pressures in its unit rates, however despite increasing volumes the proposed increase in repex for the next RCP is 7% higher than expected capex in the current RCP. AusNet refer to the change in service delivery partner as helping to has helped to:

*'...moderate the effects of these factors, contributing to a slight decrease in average pole unit rates (across all pole types) between the current and next regulatory periods (including the impact of fleet and plant costs, which are not included in Zinfra rates and, therefore, form part of our forecast of non-network expenditure).'*[75]

407. The unit rates applied align with those included in the unit rates document and are within a reasonable range of costs. As discussed in section 2, the method applied by AusNet to calculate its unit rates for the activities covered by its OMSA appear reasonable.

### Contractor support costs have been included

408. Assuming the volume data is correct, the costs included in the cost build up model total $184.8 million ($2024), however a higher value of $190.8 million ($2024) has been used as the basis of the input to the capex model. AusNet has stated that the higher cost includes contractor support costs (i.e. Zinfra overheads are not captured in unit rates and charged to AusNet separately). These costs are excluded from the poles cost buildup.

409. Our review has focussed on direct costs. We are also aware that in response to our information request,[76] AusNet has reprofiled its contractor support costs across the repex program.

### Findings

410. We consider that the proposed increase in its pole replacement program is not justified, and the expenditure is overstated.

411. As actual pole interventions are based on actual observed / measured condition, rather than a forecasting model, we consider that the volume of pole interventions are likely to be similar to those undertaken historically. However, AusNet has included poles dedicated to the provision of streetlighting, and which is more typically treated as alternative control services (ACS) and which should be removed. We found that this was proposed and subsequently removed in the determination for the current RCP.

412. AusNet has also assumed a lower staking rate than in other networks, and lower than it has traditionally undertaken which results in a higher proportion of replacements, at a higher unit cost. Absent better information, we consider that a more reasonable forecast should be based on a staking rate in line with AusNet's current practice.

74 AusNet response to IR020

75 Regulatory proposal, page 134

76 AusNet response to IR020

## 3.3.6 Crossarms

### What AusNet has proposed

413. AusNet has included crossarm replacement at a total estimated cost of $46.4 million as shown in Table 3.30.

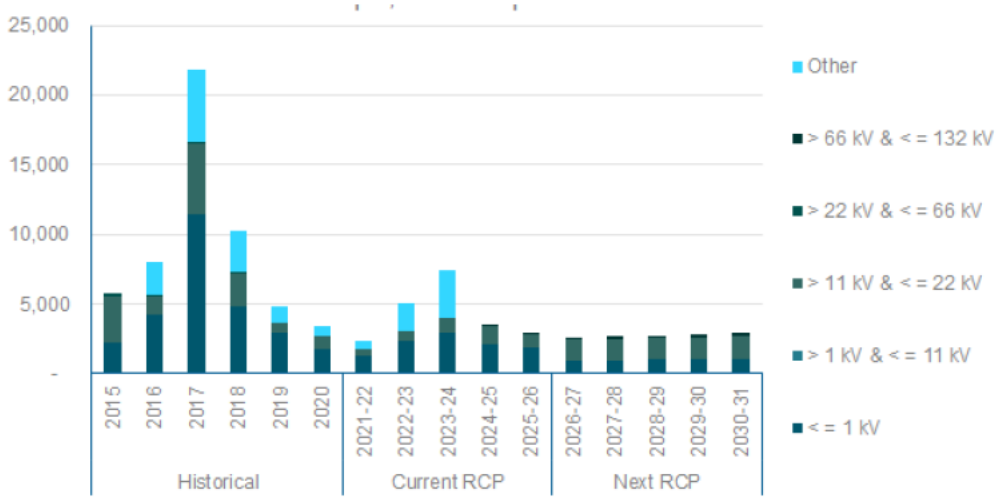
*Table 3.30: AusNet proposed for crossarms repex - $m, real FY2026*

| Crossarms | 2026-27 | 2027-28 | 2028-29 | 2029-30 | 2030-31 | Total |
|---|---|---|---|---|---|---|
| HV | 5.4 | 5.7 | 5.9 | 6.2 | 6.4 | **29.6** |
| LV | 2.4 | 2.5 | 2.6 | 2.7 | 2.9 | **13.1** |
| sub transmission | 0.7 | 0.7 | 0.7 | 0.8 | 0.8 | **3.7** |
| **Total** | **8.5** | **8.9** | **9.2** | **9.7** | **10.1** | **46.4** |

*Source: EMCa table, derived from AusNet SCS capex model*

414. According to RIN data, the volume of crossarm replacement is decreasing relative to historical levels as shown in Figure 3.14. We assume that the total replacement volume of 13,816 indicated in the RIN also includes other programs that result in crossarm replacements, including resilience and which are beyond the scope of our review.

*Figure 3.14: Comparison of historical and forecast pole top structure replacement volume*




*Source: EMCa derived from RIN*

### Assessment

#### Crossarm replacement modelling is based on predicted failure volumes and not economic analysis

415. The approach to determining the crossarm replacement volume is as described for poles, with beta of 2.5 and eta (shape value) of 95. No economic analysis is provided.

416. The replacement modelling results in 9,810 failures predicted for the next period, however the proposed volume is higher, at 10,452. We expect that this is likely due to differences in the model and spreadsheet representation.

#### Overlap with other programs has been removed

417. As for poles, the same assumption has been applied to remove 4% of crossarm replacements that AusNet considers would be replaced by other programs. The crossarm replacement volume is reduced using an allocation of 71% HV and 29% LV crossarms in

each year. No ST crossarms have been removed from this process. The proposed replacement volume, after removal of crossarm replacements undertaken as part of other programs, is shown in Table 3.31.

*Table 3.31: Proposed crossarm replacement volume*

| | Model output | 2026-27 | 2027-28 | 2028-29 | 2029-30 | 2030-31 | Total |
|---|---|---|---|---|---|---|---|
| Crossarms - HV | 5,937 | 1,046 | 1,087 | 1,127 | 1,168 | 1,209 | **5,637** |
| Crossarms - LV | 3,697 | 664 | 689 | 715 | 742 | 769 | **3,579** |
| Crossarms – Sub-transmission | 818 | 153 | 158 | 164 | 169 | 174 | **818** |
| **Total** | **10,452** | **1,863** | **1,934** | **2,006** | **2,079** | **2,152** | **10,034** |

*Source: EMCa derived from EMCa IR#020 Crossarms and ASD - AusNet - Replacement and safety programs - cost buildup - 31 Jan 2025 - CONF*

#### Whilst consideration of alternate volumes or forecasting methods has not been explored, AusNet has proposed a reduction to the proposed number of replacements

418. We generally consider that analysis of alternate volumes for intervention, and which may extend to different forecasting methods and/or the impact to risk of higher or lower intervention volumes, is a key consideration in demonstrating a prudent and efficient intervention volume. Whilst we did not see evidence that AusNet had done this for its proposed crossarm replacement program, we observe that AusNet has reduced its crossarm replacements when compared with the current RCP.

#### Unit rates appear reasonable

419. The unit rates applied align with those included in the unit rates document and are within a reasonable range of costs.

#### Findings

420. Despite an absence of economic analysis included for its crossarm replacement program, we consider the proposed repex for pole top structure replacement is reasonable. We base this primarily on a decrease in the number of replacements from historical levels and assumed unit costs that we consider are within a reasonable range of costs.

### 3.3.7 Conductor

#### What AusNet has proposed

421. AusNet has included conductor replacement at a total estimated cost of $127.1 million as shown in Table 3.32.

*Table 3.32: AusNet proposed for conductor repex - $m, real FY2026*

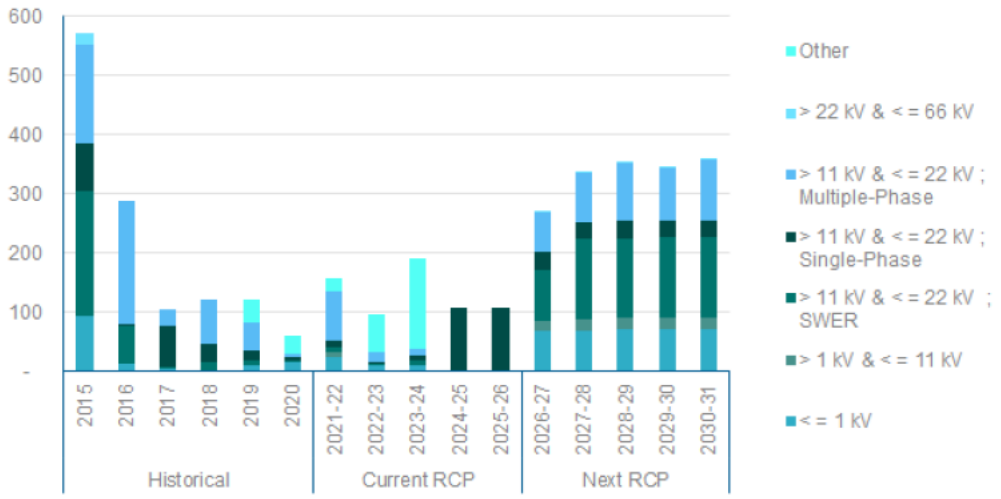
| Conductor | 2026-27 | 2027-28 | 2028-29 | 2029-30 | 2030-31 | Total |
|---|---|---|---|---|---|---|
| ACSR HV (sub transmission) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | **0.0** |
| ACSR LV & MV | 8.7 | 8.9 | 9.1 | 9.3 | 9.4 | **45.3** |
| Aluminium LV & MV | 9.4 | 9.5 | 9.7 | 9.9 | 10.0 | **48.6** |
| Cu HV | 2.3 | 2.4 | 2.5 | 2.5 | 2.6 | **12.4** |
| Steel | 4.1 | 4.1 | 4.1 | 4.2 | 4.2 | **20.8** |
| SWER (non-codified) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | **0.0** |
| **Total** | **24.5** | **25.0** | **25.5** | **26.0** | **26.2** | **127.1** |

*Source: EMCa table, derived from AusNet SCS capex model*

422. This is in addition to conductor-related expenditure included in its safety program, and its compliance program.

423. According to RIN data, the volume of conductor replacement is increasing relative to historical levels. AusNet states that the volume of condition-based conductor replacement is decreasing by 10% from around 1,040 km in the current period to around 930 km in the 2026-31 regulatory period. To understand the volume of conductor replacement proposed, we considered the total conductor replacement as shown in Figure 3.15.

*Figure 3.15: Comparison of historical and forecast conductor replacement volume (km)*




*Source: EMCa derived from RIN*

424. Figure 3.15 shows a step increase in conductor replacement volumes commencing in the next RCP, to a level above that recorded in recent history. This is due to continuing (and expanding) the safety-driven programs commenced in the current RCP.

### Assessment

#### Conductor modelling assumptions have not been adequately explained or calibrated

425. AusNet's approach to determining the conductor replacement volume is as described for pole and crossarms. However, the Weibull parameters appear to be standard values of 3.5 and eta (shape value) of 50.

426. The application of the Weibull distribution does not appear to be based on conductor natural age or assessed condition, but a modelled age. We have not been provided the basis of the modelled age.

427. AusNet has not adequately described how the failure distribution has been derived from or calibrated against observed experience in relation to failures. In addition, when the results of the modelling indicate such a large step increase in replacement volume, we would have expected to see some further top-down analysis presented to test the robustness of the modelling outcomes, which we have not seen.

### Replacement volume determined when it is economic to replace

428. AusNet determines the replacement year of each conductor segment as the year that the NPV is at its maximum.

429. From this model,[77] AusNet has determined the average replacement volume over 7 years then used this volume as the basis of its proposed 5-year program. To do this, it has identified all items that are indicated as being NPV positive in year 0 to year 7 inclusive as shown in Table 3.33. In other models that AusNet has applied, the data from years 3 to 7 was included. In this way, AusNet states that it seeks to smooth the conductor replacement volume between the current and next RCP.

*Table 3.33: Model outputs (km)*

| | Modelled optimal year | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| **Program** | **0** | **1** | **2** | **3** | **4** | **5** | **6** | **7** | **Total** |
| Conductor model | 15.4 | 12.1 | 17.6 | 21.3 | 418.2 | 280.0 | 195.7 | 358.8 | **942.3** |

*Source: ASD – Conductor – Economic model 31 Jan 2025 - CONF*

430. AusNet provides the breakdown of its proposed conductor replacement volume of 942km by conductor type as indicated in Table 3.34.

*Table 3.34: Proposed conductor replacement volume by conductor type (km)*

| Conductor description | Model output | Annual replacement volume |
|---|---|---|
| Conductor - Cu HV | 98.3 | 19.7 |
| Conductor - ACSR LV & MV | 335.0 | 67.0 |
| Conductor - Steel | 150.6 | 30.1 |
| Conductor - Aluminium LV & MV | 357.8 | 71.6 |
| Conductor - ACSR HV (Subtr) | 0.3 | 0.1 |
| Conductor - Aerial Bundled Cables | 0.0 | 0.0 |
| Unknown | 0.3 | 0.1 |
| **Total** | **942.3** | **188.5** |

*Source: EMCa derived from ASD – Conductor – Economic model – 31 Jan 2025*

### We consider that the assumed consequence values are overstated

431. For a number of the conductor sections we reviewed, the consequence values appeared very high. We saw examples of this for the estimate of value of unserved energy and also bushfire consequence. We were not able to see how the calculations flowed through the model from the input data for all conductor sections, as the model provided to us was an extract.

432. The updated model provided to us included the derivation of the CoF values, as the combination of likelihood and consequence. For the customer CoF we summarise as:

- Likelihood as a ratio of the length of conductor exposed to the failure:

[77] ASD – Conductor – Economic model – 31 Jan 2025

- If a Distribution Feeder Automation (DFA) scheme was in place, the likelihood determined as the ratio of section length divided by substation length
- If a DFA scheme was not in place, the likelihood being one minus the ratio of distance to the substation divided by the substation length, and
- Consequence is the multiple of average yearly demand, average customers impacted by the outage and VCR.

433. We make the following observations about the formula:

- The segmentation and restoration are only taken account of for DFA schemes, where the likelihood reflects the portion of section affected. Whereas if a DFA scheme was not in place, the likelihood impacted the portion of substation length downstream (as measured by distance from the substation) of the conductor section; therefore, it ignores any potential segmentation, and
- The full average customer outage time is assumed for all outages.

434. We looked further into the data provided and found that the average demand was consistent across the feeders for each substation. The model appears to consider the conductor section as a proportion of the length of conductor associated with the substation, and therefore the substation load is more relevant than the individual feeder load. However, this assumes that the substation load and feeder characteristics are homogeneous, and which is not likely to be the case.

435. We consider that the combination of these factors is likely to result in an overstatement of the benefit for some conductor sections.

### AusNet state that the overlap with other programs has been removed

436. Included in the updated copy of the model provided with IR020, AusNet has applied a post model adjustment.

437. AusNet has determined that a total of 17.2km of conductor is likely to be replaced in other programs and has removed this volume from the proposed program. However, a direct reduction would result in a revised total of 925.1 km, however a slightly higher total of 927km has been included in the submission.[78] We don't consider this a material difference for the purpose of our assessment.

### Absent consideration of alternate volumes or forecasting methods, AusNet's proposed increase is not sufficiently justified

438. We consider that the analysis of alternate volumes for intervention, and which may extend to different forecasting methods and/or change the resulting network risk of higher or lower intervention volumes is a key consideration in demonstrating that the proposed program is reflective of a prudent and efficient intervention volume. Whilst this has not been demonstrated, AusNet states that the proposed replacement volume is a decrease on historical levels, when the additional safety and compliance programs are not included. This is despite a small increase to the proposed expenditure.

439. Absent this analysis, we are not able to confirm that AusNet is proposing a decreasing program. Based on the volumes recorded in the RIN data, the annual average conductor replacement for the first three years of the current RCP was approximately 150km per year inclusive of all programs.[79] Including the estimate replacement volume, the annual average reduces to 132km and 660kms in total. We are not able to isolate the volumes included for the asset replacement program separately from other programs that also replace conductor (e.g. bushfire) and therefore need to consider the implications across all conductors.

440. If we consider that the largest bushfire conductor replacement program is insulation of SWER, and AusNet state it is on track to replace 100km over the regulatory period and approximately 7 km of SWER due to condition, then the balance of 555kms is primarily due

78 ASD – AusNet – Replacement and safety programs – cost buildup – 31 Jan 2025 - CONF

79 Including other category

to the asset replacement program, or approximately 110km per year. With this perspective, the proposed program of 188.5km would represent a material increase on this volume of replacement.

441. At a total level, inclusive of all programs replacing conductor, AusNet proposes to replace over 330 kms per year, or over 1,600 kms in the next RCP.

#### Unit rates are within a reasonable range of costs

442. AusNet describes the driver of the increase in expenditure for conductor replacement as increases in conductor unit rates due to market-driven cost pressures, with the average conductor unit rate (across all types) increasing by approximately 20% between the current and next RCPs.

443. The unit rates applied align with those included in the unit rates document and are within a reasonable range of costs. However, we found different numbers in the models for a sample of conductor sections. As the results were the same across both models, we didn't place any weight on these differences.

#### Findings

444. We consider that AusNet has not sufficiently justified the proposed increase in conductor replacement and therefore that its proposed conductor repex is overstated.

445. AusNet has not adequately described how the failure distribution it has used has been derived from or calibrated against observed experience in relation to failures. In addition, when the results of its modelling indicate such a large step increase in replacement volume, we would have expected to see some further top-down analysis presented to test the robustness of the modelling outcomes and which we have not seen.

446. Whilst AusNet states that the proposed volumes are similar to the current RCP, this is not supported by RIN data, which suggests that this is not the case. We consider that the conductor program is best considered in aggregate, inclusive of all programs targeting the replacement of conductor.

## 3.4 Assessment of safety programs

### 3.4.1 What AusNet has proposed

447. AusNet has included five safety projects for the next RCP at a total estimated cost of $97.2 million in its repex forecast as shown in Table 3.35. This is in addition to the safety programs included in its augex forecast.

*Table 3.35: AusNet proposed for safety repex - $m, real FY2026*

| Safety | 2026-27 | 2027-28 | 2028-29 | 2029-30 | 2030-31 | Total |
|---|---|---|---|---|---|---|
| Proactive Fuses | 18.9 | 8.6 | 7.6 | 9.1 | 8.3 | **52.5** |
| Bare conductor condition | 1.7 | 1.7 | 1.7 | 1.8 | 1.8 | **8.7** |
| SWER condition | 0.6 | 0.6 | 0.6 | 0.6 | 0.6 | **3.1** |
| Proactive insulation / undergrounding SWER | - | 7.8 | 7.8 | 7.9 | 7.9 | **31.4** |
| SWER Earths | 0.3 | 0.3 | 0.3 | 0.3 | 0.3 | **1.5** |
| **Total** | **21.6** | **19.0** | **18.0** | **19.6** | **19.0** | **97.2** |

*Source: EMCa table, derived from AusNet SCS capex model*

448. We show the replacement volumes and unit rates assumed in Table 3.36.

*Table 3.36: Proposed safety program replacement volume*

| Safety Program | 2026-27 | 2027-28 | 2028-29 | 2029-30 | 2030-31 |
|---|---|---|---|---|---|
| Proactive Fuses | 3,510 | 1,596 | 1,395 | 1,661 | 1,506 |
| Bare conductor condition/risk-based replacement (Codified Areas) | 2 | 2 | 2 | 2 | 2 |
| SWER condition/risk-based replacement (Codified Areas) | 4 | 4 | 4 | 4 | 4 |
| Proactive insulation/undergrounding of SWER (Codified areas) | - | 50 | 50 | 50 | 50 |
| SWER Earths | 81 | 81 | 81 | 81 | 81 |

*Source: AusNet replacement sand safety program cost build up*

### General network incidents are decreasing, however fires from asset failure incidents

449. An important indicator of the change in safety risk on the network is the number of asset failures, and specifically incidents with potential for a fire start. AusNet states that the latter has been decreasing since 2009:

> *'...since 2009, the number of incidents with the potential to cause a fire and the actual number of fire starts caused by our assets has fallen. These figures show that despite weather conditions worsening we have been able to achieve a slight downward trend in potential and actual fires.'*[80]

450. This trend is also evident in the ESV public safety report, that shows that the number of all asset failure incidents and contact incidents are lower than the long-term average.[81] However, according to ESV, the numbers of fires from asset failure incidents was lower in 2022–23 than the long-term average in all categories, except for HV fuse failures and conductor failures. We observe that these categories are a focus of AusNet's proposed programs.

## 3.4.2 Proactive Fuses

### What AusNet has proposed

451. The proactive MV fuse program targets Expulsion Drop Out (EDO) fuses and Boric Acid (BA) fuses, which are both known for contributing to asset fires and are among the leading causes of ground fires.

452. AusNet proposes to continue the current fuse replacement program and proactively replace approximately 1,900 fuses per annum. In addition, fuses would be replaced in association with the pole replacement program, and further BA fuse replacements due to candling would be covered as a part of the reactive program.

453. AusNet Services utilises the fire loss consequence model (FLCM) to undertake an economic analysis of the fuse population. The focus of the EDO strategy is to continue replacing the EDO fuses, which represent the highest risk, with Fault Tamer fuses, or equivalent.[82]

454. The proposed replacement volumes have been derived using a semi-quantitative risk assessment method using a consequence/likelihood matrix. The consequence of a fuse

80 Regulatory proposal, page 203

81 ESV, 2023 safety performance report on Victorian Electricity networks

82 AMS 20-13

malfunction is assigned with a consequence cost which is determined by the bushfire effect cost, value of unserved energy, and health and safety cost. The replacement cost has been derived from historical financial records.

### Assessment

#### AusNet states that it is replacing a higher level of fuses than was included in the determination for the current period

455. The regulatory proposal for the current RCP states:

> *'Our proposal for the 2022-26 regulatory period sees us continuing our current EDO fuse replacement program and the replacing approximately 1,750 EDO fuses per annum. This compares to the 2,900 EDO fuses that we expect to replace annually in the period 2016-20. The forecast cost for these fuses is $23.2 million (direct, $2021).'*[83]

456. In response to our information request, AusNet states its proactive replace approximately 7,200 (1,800 p.a.) fuses between 2023-26.[84] AusNet included a statement regarding the allowance in the current period:

> *'We also note the expected replacements in the current period are significantly above the allowance approved of 1,928 units (386 p.a. over 5 years).'*[85]

457. We did not find commentary about this program from the AER in its determination.

#### The unit rate has increased materially over this time

458. The average unit rate applied to the current RCP is approximately [redacted] 2021) and after conversion to $2024, is much lower than the assumed unit cost of [redacted] ($2024) for AusNet's proposal for the next RCP.[86]

459. AusNet's unit rate document[87] refers to the unit rate being based on OMSA rates and reported volumes and costs in historical annual RINs. We are not able to isolate this program in the RIN. We were curious about why the time period referred to in the calculation of the unit rate was between 2011 and 2013, which is more than 10 years ago, and seemingly not reflective of current rates.

460. Based on representations made by AusNet concerning other unit rates, the relationship to the OMSA agreement where AusNet states it has made reductions and on our own experience, we consider that the unit rate is likely to be higher than an efficient level.

#### Asset management strategy includes reference to a similar level of fuse replacements to what AusNet has proposed

461. The AMS for fuses is included in the AMS 20-13 Enhance network safety. The focus of the EDO strategy is to continue replacing the EDO fuses which represent the highest risk with Fault Tamer fuses, or equivalent. Despite reference to 1,750 fuses per year,[88] the strategy also refers to 9,688[89] over the next RCP (or approx. 1900 per year). Based on our analysis of the current period, it appears the AMS has reflected volumes that it has both incurred and is planning to undertake.

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83 AusNet Services Regulatory proposal 2022-26, page 94

84 AusNet response to IR020, Proactive fuses

85 AusNet response to IR020, Proactive fuses

86 ASD - AusNet - Replacement and safety programs - cost buildup - 31 Jan 2025 - CONF

87 ASD - Appendix 6C AusNet - Unit Rates-31 Jan 2025 - CONFIDENTIAL

88 AMS 20-13, Table 1

89 AMS 20-13, Table 5

### Fuse related failures are amongst the highest of its peers

462. In AusNet's response to IR020, it provided an extract from a report produced by Energy Safe Victoria (with the name of other major electricity companies (MECs) redacted) and shared with AusNet demonstrating the asset failure performance for fuses, compared with other MECs in Victoria. We provide a copy in Figure 3.16. Whilst not normalised for asset population, AusNet concludes that this data demonstrates that it is experiencing significantly higher numbers of HV fuse failures than its peers, underscoring the continuation of its EDO and BA fuse replacement programs.

*Figure 3.16: Comparison of asset failure incidents for fuses across MECs*

**OSIRIS - SERIOUS & OTHER INCIDENTS (R28 vs R29) BY CATEGORY, MEC & FY**

| NSR Category | 2020 | 2021 | 2022 | 2023 | 2024 | 2025 | Total |
|---|---|---|---|---|---|---|---|
| **Asset Failure** | **118** | **130** | **109** | **111** | **108** | **48** | **624** |
| **AusNet Services Distribution** | **74** | **77** | **74** | **80** | **77** | **44** | **426** |
| **Fuse** | **74** | **77** | **74** | **80** | **77** | **44** | **426** |
| Boric acid | 38 | 41 | 52 | 62 | 60 | 35 | **288** |
| EDO fuse | 23 | 27 | 20 | 18 | 15 | 7 | **110** |
| Any other type | 9 | 3 | | | | 1 | **13** |
| Connection box | 2 | 2 | 1 | | | | **5** |
| Powder filled | 2 | 1 | | | 1 | 1 | **5** |
| Conductor (bare) | | 2 | 1 | | | | **3** |
| Disconnector/isolator | | | | | 1 | | **1** |
| Other | | 1 | | | | | **1** |
| [redacted] | **29** | **48** | **26** | **21** | **21** | **3** | **148** |
| **Fuse** | **29** | **48** | **26** | **21** | **21** | **3** | **148** |
| EDO fuse | 20 | 32 | 18 | 10 | 11 | 2 | **93** |
| Boric acid | 3 | 11 | 1 | 3 | 3 | | **21** |
| Connection box | 2 | 1 | 2 | 3 | 3 | 1 | **12** |
| Meter board (including fuses) | 2 | | 3 | 4 | 2 | | **11** |
| Any other type | | 2 | 2 | | | | **4** |
| Powder filled | 1 | 1 | | | 1 | | **3** |
| Disconnector/isolator | | | | 1 | 1 | | **2** |
| Pole mounted;Boric acid | 1 | | | | | | **1** |
| Surge diverter | | 1 | | | | | **1** |
| [redacted] | **12** | **3** | **9** | **9** | **8** | **1** | **42** |
| **Fuse** | **12** | **3** | **9** | **9** | **8** | **1** | **42** |
| [redacted] | **1** | **1** | | **1** | **1** | | **4** |
| **Fuse** | **1** | **1** | | **1** | **1** | | **4** |
| [redacted] | **2** | **1** | | | **1** | | **4** |
| **Fuse** | **2** | **1** | | | **1** | | **4** |
| **Total** | **118** | **130** | **109** | **111** | **108** | **48** | **624** |

| Category | 2020 | 2021 | 2022 | 2023 | 2024 | 2025 | Total |
|---|---|---|---|---|---|---|---|
| **Asset Failures** | **1** | **281** | **262** | **276** | **178** | **76** | **1,074** |
| **AusNet Services (D)** | **1** | **203** | **196** | **235** | **127** | **60** | **822** |
| **Fuses** | **1** | **203** | **196** | **235** | **127** | **60** | **822** |
| LV fuse | | 113 | 78 | 144 | 35 | 3 | **373** |
| HV fuse (boric acid) | | 48 | 67 | 52 | 62 | 40 | **269** |
| HV fuse (EDO) | 1 | 36 | 43 | 32 | 26 | 15 | **153** |
| HV fuse (powder-filled) | | 2 | 6 | 4 | 1 | 1 | **14** |
| HV fuse (Fault Tamer) | | 3 | 2 | 3 | 3 | 1 | **12** |
| HV fuse (unknown) | | 1 | | | | | **1** |
| [redacted] | | **75** | **61** | **39** | **42** | **14** | **231** |
| **Fuses** | | **75** | **61** | **39** | **42** | **14** | **231** |
| HV fuse (EDO) | | 63 | 55 | 27 | 30 | 11 | **186** |
| HV fuse (powder-filled) | | 4 | 3 | 5 | 6 | | **18** |
| HV fuse (boric acid) | | 3 | 3 | 4 | 4 | 1 | **15** |
| LV fuse | | 5 | | 3 | 2 | 2 | **12** |
| [redacted] | | | **2** | **1** | **8** | | **11** |
| **Fuses** | | | **2** | **1** | **8** | | **11** |
| HV fuse (EDO) | | | | 1 | 4 | | **5** |
| LV fuse | | | 2 | | 1 | | **3** |
| HV fuse (powder-filled) | | | | | 2 | | **2** |
| HV fuse (boric acid) | | | | | 1 | | **1** |
| [redacted] | | **3** | | **1** | **1** | **2** | **7** |
| **Fuses** | | **3** | | **1** | **1** | **2** | **7** |
| LV fuse | | | | 1 | 1 | 1 | **3** |
| HV fuse (boric acid) | | 1 | | | | 1 | **2** |
| HV fuse (EDO) | | 1 | | | | | **1** |
| HV fuse (powder-filled) | | 1 | | | | | **1** |
| [redacted] | | | **3** | | | | **3** |
| [redacted] | | **3** | | | | | **3** |
| [redacted] | | **3** | | | | | **3** |
| **Total** | **1** | **284** | **262** | **276** | **178** | **76** | **1,077** |

*Source: IR020*

463. Our observation is that AusNet's fuse failures are amongst the highest of the Victorian MECs and this provides further support for the continuation of a program for the replacement of its BA and EDO fuses to minimise fire risk. We focus on whether AusNet has determined the prudent volume of this program, accepting that a program should be undertaken.

### Economic modelling used as basis for increase in replacement volume, and which is likely overstated

464. AusNet states that the proposed annual replacement volume of ~1,930 is broadly in line with its current replacement rates. AusNet's proposed volume of replacements of 9,668 units over the next RCP is based on the output of its economic modelling.

465. We requested a copy of the modelling that AusNet had undertaken and were provided with a model that reproduces the python script that calculates the PoF, CoF and runs the NPV equation, based on the following:[90]

- AusNet has applied a standard eta of 50 years and beta of 3.5. We were not provided the basis for establishing these Weibull parameters, or whether these parameters were aligned with or calibrated to AusNet's observed experience.
- The rating of the bushfire risk (Environment CoF) area is based on the Fire Loss Consequence model (FLCM) which is used to help prioritise fuse replacements, in

90 EMCa IR#020 Proactive Fuses.xlsm

accordance with the multipliers and methodology for the bushfire CoF included in its risk assessment methodology.

- No sensitivity analysis has been presented.

466. We have concerns over the application of standard Weibull parameters without calibration to observed performance, and which may result in overstating the risk and number of fuse replacements that AusNet will undertake.

467. The year of replacement has been identified based on when the investment first becomes NPV positive and is therefore economic to replace during the next RCP. As discussed in section 2, we consider that this is likely to advance each project relative to its justified economic timing, and therefore to result in a program that is larger than is efficient in the next RCP.

#### Findings

468. We consider the proposed increase to the proactive fuse program is not sufficiently justified, and the proposed repex overstated.

469. AusNet has not established a sufficient case for an uplift from the replacement volume included in the current RCP, given statements made by AusNet that the number of fire starts have been decreasing.

470. We have concerns over the application of standard Weibull parameters without calibration to observed performance, and which may result in overstating the risk and number of fuse replacements that AusNet will undertake.

471. The unit rate for AusNet's proposed program is higher than AusNet has included in its proposal for the current RCP, and notwithstanding market-based increases, the value proposed is likely to be higher than an efficient level.

### 3.4.3 Bare conductor condition

#### What AusNet has proposed

472. AusNet's strategy is to continue the program of conductor replacement targeting deteriorated conductor, based on the risk modelling outcomes. AusNet has proposed 10kms for replacement in the next RCP.

#### Assessment

##### Proposed replacement volume is a slight increase on the current period

473. AusNet's current condition-based replacement forecast is for 7 km of SWER conductor in Codified Areas to reach end of life over the 2021-25 regulatory period. This represents 1% of the SWER conductor in Codified Areas replaced over a 5-year period.

##### Assumed unit rates assumed are higher than other parts of its program

474. According to unit cost report, the unit cost of [redacted] has been applied based on recent Project PCRs to replace 3-phase bare 22kV with covered 22kV line. However, this cost exceeds the cost assumed for replacing High Voltage Aerial Bundled Cable with High Voltage Underground cable assumed at [redacted] and therefore does not appear correct.

475. The relevant entries in the unit cost attachment are shown in Table 3.37.

*Table 3.37: Comparison of unit rates ($000, real 2024)*

| Project type | Unit cost ($000) | Basis |
|---|---|---|
| [redacted] | [redacted] | [redacted] |
| [redacted] | [redacted] | [redacted] |
| [redacted] | [redacted] | [redacted] |

*Source: ASD - Appendix 6C AusNet - Unit Rates-31 Jan 2025 - CONFIDENTIAL*

476. We observe that AusNet assumes that it is cheaper to underground than to install covered conductor.

477. We also tested this against AusNet's 'overhang removals' also known as '56Ms.' If we assume a 40m span, as a worst-case scenario, the equivalent per km rate is [redacted] and excludes efficiencies associated with a per km rate. However, this is also materially less than the covered conductor rate assumed.

478. For our assessment purposes, we consider that AusNet's existing rate for replacement of bare conductor of [redacted] ($2024) and replacement of bare conductor with covered conductor rate of [redacted] ($2024) provides a reasonable basis for its forecast. This also aligns with historical RIN and suggests this should have been applied.

### Findings

479. We consider the proposed bare condition program is slightly overstated.

480. Given the relatively low volume of replacement and being comparable to the volumes being replaced in the current RCP, we consider that the volume of replacement proposed for this program is reasonable. In determining an overall capex allowance for the replacement of conductor we consider that the conductor replacement program is adjusted to reflect the addition of this program.

481. However, the unit rate is higher than has been applied in other parts of AusNet's program.

## 3.4.4 Replacement of bare conductor condition in SWER

### What AusNet has proposed

482. AusNet has proposed to replace 20km of bare SWER with an insulated version over the next RCP due to its aging condition. This represents approximately 3% of the SWER conductor population located in Codified areas.

### Assessment

#### AusNet has not provided a forecasting methodology

483. According to AMS 20-136[91] the approach to forecasting deteriorated conductor requiring replacement is described in AMS 20-52 Conductor. We checked AMS20-52 and did not find reference to a forecasting method, or derivation of the replacement volume.

484. AusNet did not supply a model to support its proposed forecast.

#### Unit rate assumption is reasonable

485. The unit rate applied is the same rate applied for the SWER condition replacement of [redacted] ($2024). These rates are stated by AusNet as being based on historical rates from the current and previous regulatory periods.

486. We consider the moderate increase above that applied for the bare conductor replacement rate of [redacted] to account for additional works associated with covered conductor is reasonable.

### Findings

487. We consider the proposed condition-based replacement of bare conductor in SWER project is reasonable. Whilst we have concerns that the volume of conductor has not been supporting with sufficient justification, the low volume is likely to be reasonable.

488. In determining an overall capex allowance for the replacement of conductor we consider that the conductor replacement program is adjusted to reflect the addition of this program.

## 3.4.5 Proactive insulation / undergrounding of SWER bare conductor

### What AusNet has proposed

489. AusNet proposes to continue the program from the current RCP to proactively replace bare overhead conductor in SWER with covered conductor. AusNet states that the 22 kV overhead network in Codified Areas[92] is protected by REFCL technology. However, REFCLs provide no protection against fire starts caused by SWER lines.

### Assessment

#### AusNet considers the previous bushfire reviews have set expectations for increasing rates of replacement of SWER conductor

490. AusNet states that the Victorian Bushfire Royal Commission (VBRC) and the subsequent Powerline Bushfire Safety Taskforce (PBST) with both reviews recommending undergrounding or insulating SWER lines in Codified Areas over a 10-year time period. Also, acknowledging that the timeframes for this recommendation were not taken up in Victorian legislation, AusNet states that the VBRC and PBST established replacement rate expectations with their investment in the Powerline Replacement Fund (PRF).

491. The relevant references cited by AusNet are:

- VBRC recommendation 27 – replace bare conductor with an alternative, and
- Victorian government Regulatory Impact Statement (2015) modelling assumed all would be replaced by 2040.

91 ASD - AusNet - AMS 20-136 - Proactive Insulation of SWER - 31012025 – CONF

92 Codified Areas are areas of high bushfire risk, as defined under the Electricity Safety Act 1988

### AusNet is proposing to double its current program

492. AusNet does not consider that the volume of 20km of condition-based replacement of SWER conductor in Codified areas is sufficient, and is proposing to accelerate the current program by doubling the replacement volume from 100km to 200km per regulatory period:

> *'… our proposed program, with a forecast cost of $27.2m (direct, real 2023-24), will continue and accelerate the work carried out during the current period. A replacement rate of 200km per regulatory period would see the replacement of all SWER and bare conductor by 2040, which is longer than the 10-year period recommended by the VBRC but within the 2040 timeframe.'*[93]

493. The proactive replacement program is proposed in addition to the condition-based replacement program. In its regulatory proposal, AusNet states:

> *'Because the average life of conductor is significantly longer than 25 years, replacement of SWER conductor based on condition alone will not result in replacement of SWER conductor in a timeframe consistent with the recommendations of the VBRC and PBST or the assumption in the RIS (by 2040). For example, we have assumed that 20km of SWER conductor in Codified Areas will reach end of life over the 2026-31 regulatory period.*
>
> *During the previous regulatory period, the PRF provided a significant amount of expenditure ($74m) to businesses to replace these assets. This program has led to material reductions in bushfire risk in these areas. In the current regulatory period, we are on track to deliver the 100km of replacement volumes approved at the last determination.* [94]

### Economic analysis has not been provided

494. AusNet has not provided an economic analysis to support its proposal, stating that the program was included based on maintaining average bills broadly stable in real terms:

> *'In increasing the size of this program to 200km during the next regulatory period, we have carefully considered the overall costs, and bill impacts of our proposal, as a whole. As discussed in our Executive summary, our Revenue Proposal will keep average bills broadly stable, in real terms'* [95]

495. AusNet proposes that the SWER conductor will be replaced with a combination of insulated conductor and underground cables and has adopted the same unit rate as for the condition-based replacement, being [redacted] ($2024).

#### Findings

496. We consider that the proposed increase for the proactive insulation / undergrounding of SWER bare conductor project is not justified and the proposed repex materially overstated.

497. AusNet has not provided an economic analysis or other modelling of benefits to support its proposal to double to the replacement volume in the next RCP.

## 3.4.6 SWER Earths

#### What AusNet has proposed

498. AusNet proposed to address compliance to its electricity safety management system (ESMS) and governing legislation to address 405 sites in HBRA, 81 per year at a cost of [redacted] per site.

93 AusNet regulatory proposal EDPR 2026-31, page 207

94 AusNet regulatory proposal EDPR 2026-31, page 207

95 AusNet regulatory proposal EDPR 2026-31, page 208

### Assessment

499. During our discussion with AusNet during the onsite, we understand that this is a new program. Given the significant role the earth return plays with the operation of the SWER network, and specifically protection schemes, we consider that inclusion of this program is reasonable.

### Findings

500. We consider that the project targeting the replacement of SWER earths is reasonable.

## 3.5 Assessment of compliance programs

### 3.5.1 What AusNet has proposed

501. AusNet has included a low service compliance project for the next RCP at a total estimated cost of $17.3 million as shown in Table 3.38.

*Table 3.38: AusNet proposed for compliance repex - $m, real FY2026*

| Compliance | 2026-27 | 2027-28 | 2028-29 | 2029-30 | 2030-31 | Total |
|---|---|---|---|---|---|---|
| Low service compliance | 3.4 | 3.4 | 3.4 | 3.5 | 3.5 | **17.3** |

*Source: EMCa table, derived from AusNet SCS capex model*

502. In addition, AusNet has included a further $11.2 million for development of a 3D model based on the LiDAR results in its Digital program (non-network capex) as shown in Table 3.39. We consider these two projects together.

*Table 3.39: AusNet proposed for compliance expenditure (part of non-network capex) - $m, real FY2026*

| Compliance | 2026-27 | 2027-28 | 2028-29 | 2029-30 | 2030-31 | Total |
|---|---|---|---|---|---|---|
| Conductor clearance compliance (3D Model/LiDAR) | 3.2 | 2.6 | 2.2 | 1.8 | 1.3 | **11.2** |

*Source: EMCa table, derived from AusNet SCS capex model*

### 3.5.2 Low service/conductor program – reactive program

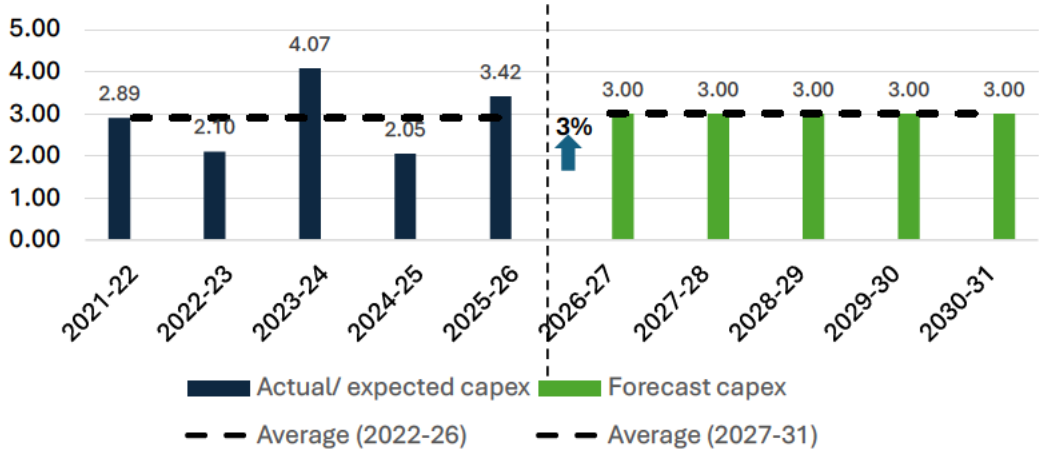
#### What AusNet has proposed

503. AusNet has proposed a program to reactively respond to low service/conductor breaches at an estimated cost of $15 million for the next RCP. This is based on the current business as usual (BAU) program, of $3 million p.a.

#### Assessment

504. We asked AusNet to provide information relating to its historical program, reproduced in Figure 3.17.

*Figure 3.17: Comparison of forecast and historical low service/conductor remediation program*

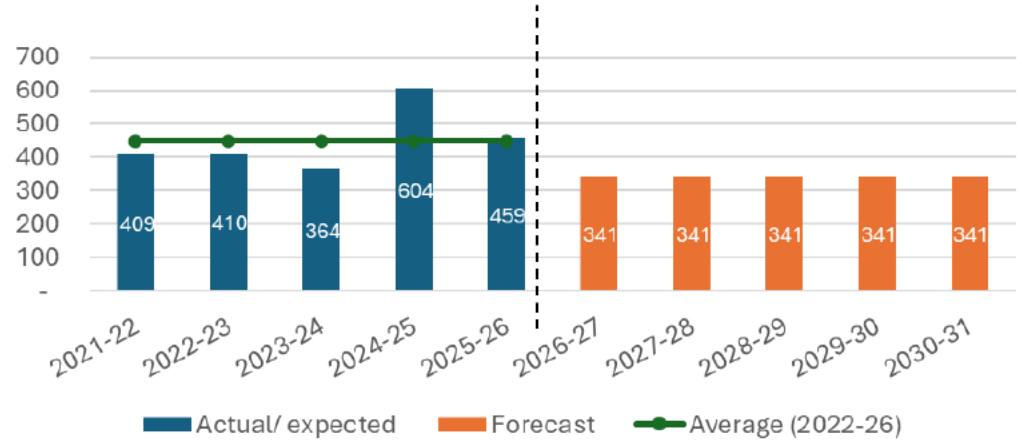



*Source: IR020*

505. We understand that the program covers combined conductor and service cable low clearance notifications requiring corrective action.

506. AusNet has also provided data on the historical and forecast replacement volumes as shown in Figure 3.18.

*Figure 3.18: Comparison of historical and forecast low service/conductor remediation program volumes*




*Source: IR020*

507. AusNet has stated that the forecast expenditure is based on historical expenditure, and not an estimate of volumes based on known or predicted non-compliances.

508. In doing so, maintaining the same expenditure is reflected in a reduced volume offset by an increase to the estimated unit rate to $8,800 ($2024). AusNet considers that the cost per LV pole is expected to be higher than has been incurred historically (focussing on service cables) due to work that will be required including a higher number of pole replacements.

### Findings

509. We consider that the proposed expenditure for the reactive low service/conductor rectification program is reasonable, given the uncertainties associated with the scope of works. Also, that AusNet has not included additional rectification works arising from its completion of LiDAR for LV networks to be completed in the next RCP.

### 3.5.3 Low service/conductor program – data capture

#### What AusNet has proposed

510. For the next RCP, AusNet has proposed to continue its Light Detection and Ranging (LiDAR) program to capture the remaining 50% of data across its network. In the current RCP, AusNet will have captured data related to approximately 50% of its network, prioritising the network in HBRA with another 50% remaining.

511. Following completion of the data capture, AusNet plans to develop a 3D model to provide a detailed view of each overhead line asset. The 3D model will assist with identifying electrical line clearances and encroachments including vegetation.

#### Assessment

##### Estimated cost reflects a build-up of requirements

512. The estimated cost of LiDAR to complete the remaining 50% of the network is $10 million ($2024) over the next RCP. The estimated cost is based on a build-up of cost elements based on survey of 27,000 km[96] for LiDAR capture and pole-top imagery capture as shown in Table 3.40.

*Table 3.40: Cost build-up of data capture program*

| Works | Description | Cost (millions $2024) |
|---|---|---|
| LiDAR | Majority of the cost is associated with the LiDAR capture using fixed wing aircraft and associated crew. Other costs include geo processing, classification and processing of imagery (data management) | 1.67 |
| Corridor imagery | Costs of easement imagery storage and processing | 0.03 |
| Pole tops | Costs of twin engine helicopter for pole top imagery (all-inclusive cost) | 7.90 |
| Project | Costs of project management, mobilisation and demobilisation | 0.54 |
| **Total** | | **10.15** |

*Source: EMCa derived from IR020 New Geo costing model_V1 - CONF*

513. The majority of the costs are contractor works, accounting for 89% of the total estimated cost and represent a reasonable build-up of costs for the scope of works.

##### Estimated cost is in line with original project estimate, commenced in current RCP

514. AusNet states that the original project to *cover LiDAR capture, data cleaning and processing and load into viewing platform* was estimated to cost $26 million, with approximately $13 million incurred for stage 1 with 50% of the HBRA network captured.[97] Based on AusNet's information, the estimated cost is within the cost estimate at the commencement of the project.

##### AusNet has identified additional costs in in its digital program

515. AusNet states that the '*cost for hosting and processing our data are digital related cost that are embedded within our digital capex forecast.*'[98] However we did not find any additional

[96] Based on the survey of 18,000 km of line in a grid pattern, assuming a 1.5 multiplier

[97] AusNet response to IR020

[98] AusNet regulatory proposal EDPR 2026-31, page 207

information that explains this statement, or where the additional costs may be reflected in the proposed digital capex forecast.

516. AusNet identified a further cost of $5 million ($2024) for digital processes and which we infer is associated with moving its imagery to the Neara platform. However, we did not see where these costs had been explicitly included in the proposed compliance capex, nor where the surrender of licences associated with its current platforms had similarly been recorded.

517. We did however find the proposed $5 million included in AusNet's Network Model Management (NMM) project which we consider in our assessment of AusNet's digital program in our companion report to the AER.

#### Findings

518. We consider that the proposed expenditure for data capture is reasonable.

## 3.6 Findings and implications for proposed repex

### 3.6.1 Summary of findings

#### General

519. AusNet has proposed a repex forecast that is 74% above the repex included in the capex allowance for the current RCP and $527.6 million (or 67%) above the repex that it expects to incur in the current RCP.

520. AusNet refers to deteriorating asset condition and increasing unit rates as the key drivers for the increase in repex.

521. We have been asked by the AER to consider approximately 60% of the proposed repex by AusNet across a range of asset groups, split between distribution lines related expenditure (poles, crossarms and conductor) and substation related expenditure (transformers, switchgear, SCADA and Other). The AER nominated specific projects and programs from AusNet's capex model for our review, and which include asset replacement, safety and compliance programs. Our findings relate to the projects and programs included in our review.

522. AusNet has included part of its replacement of its ADMS system in a project titled '*10 ADMS Energy Management (SCADA/OT portion)*' as repex. We consider this as a part of our assessment of the Digital program in a separate report to the AER.

523. AusNet has included a further $11.2 million for development of a 3D model based on the LiDAR results in its Digital program (non-network capex) to complement the low service program included in the compliance repex. We consider there are sufficient synergies across the two projects to include this in our review of the proposed repex.

524. The information provided initially by AusNet was not conducive to a review in accordance with the capex assessment guidelines, as the models and supporting information were incomplete. We made several requests for the models and supporting information that we considered that AusNet had relied upon in preparing its expenditure forecast and were subsequently provided with this information. We have taken account of this information in our review.

525. As discussed in section 2, we found examples of modelling issues that are described in that section that we consider have led to a higher-than-prudent level of replacement. Where cost estimates were provided, we found evidence that the cost estimates were higher than an efficient level due to higher unit rates than AusNet has been incurring and/or inclusion of risk allowances.

### Substation-related asset replacement expenditure

526. AusNet provided models for its substation-related expenditure, however in some cases their functionality was limited. We asked for and were provided with additional models that assisted our ability to review the proposed projects and programs. Some of the models continued to be based on hard-coded values, which limited our ability to understand the methods that AusNet had applied to derive this value in some cases.

527. We find that AusNet's proposed program is made up of substation rebuild projects deferred from the current RCP and new projects for the next RCP. Based on AusNet's application of its post model adjustments, and general capex smoothing the timing of the substation rebuild projects has included some deferral. However, we have not been convinced by AusNet's timing analysis and expect that here may be further deferral of some projects, resulting in expenditure being incurred outside of the next RCP.

528. For substation projects (including rebuild, plant and secondary systems) we found that the analysis was sensitive to changes in the VCR applied by AusNet, and application of the values included in the 2024 AER VCR study results in deferral of the timing of some projects.

529. We also found application of some of the probability of failure distributions that AusNet had applied had not been adequately calibrated against its observed experience, or where its modelling indicated a step increase in replacement volumes that should have necessitated a review of replacement volumes using other methods.

530. We consider that the method applied by AusNet to determine its program based only on positive NPV has led it to propose projects in advance of when their timing is justified.

### Distribution lines-related asset replacement expenditure

531. The models for its distribution lines related expenditure are largely based on AusNet's historical trends in defects, and not economic analysis as required under the AER guidance.

532. AusNet states that the asset replacement volumes that it has proposed represent slight increases on its historical replacement. However, upon closer review, we find elements of the program that are not sufficiently supported. This is particularly the case for poles repex, whereas for crossarms the volume is lower than AusNet has been incurring.

533. For conductor repex, whilst the volumes are similar, the total replacement volumes when considering the addition of the safety and compliance programs, represent a material step increase.

534. We consider that the analysis of alternate volumes for intervention, and which may extend to different forecasting methods and/or the impact to risk of higher or lower intervention volumes, is a key consideration ion demonstrating a prudent and efficient intervention volume.

### Safety-driven expenditure

535. AusNet's safety program comprises the replacement of conductor, SWER earths and fuses. For conductor replacement, these programs are in addition to those included as part of its asset replacement and compliance driven repex. We consider that analysis of the prudent and efficient conductor replacement should take account of the total volume of conductor replacement targeted under each of these programs. To that end, we consider that AusNet has not sufficiently justified parts of its proposal including the proposed proactive insulation of its SWER network. AusNet has not provided an economic analysis to support its proposed increase in proactive insulation of its SWER network, stating that the program was included based on 'managing average bills broadly stable in real terms.'

536. For other conductor replacement programs, we consider that the relatively low volume of replacement that AusNet has proposed for its condition-based conductor programs are reasonable. However, in parts we found some examples of unit rates that differed from AusNet's published unit rates and which suggests that these rates are reflected in the forecast expenditure.

537. We find that the programs targeting the SWER earths are reasonable, however the proposed uplift that it has proposed for the proactive fuse program is not. AusNet has not demonstrated that the uplift is economic, or that the performance of the network is declining such that the uplift is prudent to undertake.

#### Compliance-driven expenditure

538. For the compliance-driven programs we have reviewed, we consider that the low/service conductor programs comprising AusNet's reactive rectification program, and data capture are reasonable, and reflect a prudent option.

### 3.6.2 Implications for proposed capex allowance

539. We have been asked to review projects with aggregate proposed capex of $799.1 million, including conductor compliance IT of $11 million. For the current report, we exclude repex for the ADMS OT project of $40 million which we assess in our companion ICT report. These projects comprise part of AusNet's aggregate proposed repex of $1,317 million.

#### Alternative forecast methodology

540. For the two projects that we were asked to review under the category of pole top structure asset group repex and Compliance, we consider AusNet's proposed capex is reasonable.

541. For each of the other eight categories of expenditure that we were asked to review, we consider that AusNet's proposed capex is not a reasonable forecast of its expenditure requirements for the next RCP. Our proposed alternative forecast for these categories involves one or more of the following adjustments, to the extent that it formed the basis of AusNet's forecast and which we consider to be not justified or overstated:

- Adjustment to the volume of work
- Adjustment to the unit cost basis for the proposed forecast, including by removal of the additional risk allowance
- Adjustment to the timing of the proposed expenditure, resulting in deferment beyond the end of the next RCP
- Adjustments to correct modelling issues and/or unsupported or incorrect model input assumptions
- Adjustment to align the forecast with historical spend, where an ongoing level of expenditure represents a reasonable default assumption and where the proposed increase was not otherwise justified.

#### Alternative forecast of expenditure

542. We consider that a reasonable alternative forecast for AusNet for the repex categories that we reviewed, would be between 30% and 35% less than AusNet has proposed.

543. We stress that our advice on an alternative forecast relates only to the categories of expenditure within the scope of our review and does not necessarily have any implication for repex that was not within the scope of our review.

# 4 REVIEW OF PROPOSED AUGMENTATION EXPENDITURE (AUGEX)

AusNet has proposed a material uplift in augex activity relative to the augex that it expects to incur in the current period.

The AER has asked us to assess a subset of AusNet's proposed $960 million augmentation program for the next RCP, comprising projects and programs with an aggregate capital expenditure of $678 million. This includes CER-related augex programs totalling $173.7m, which we review in section 5; therefore in the current section we review augex programs with an aggregate value of $504.7m.

Overall, we consider that AusNet's proposed augex that we reviewed is materially overstated. This is for a number of reasons, but which primarily relate to unsupported assumptions in AusNet's cost-benefit analyses and which overstate the economic benefits of the proposed projects.

We consider that a reasonable alternative forecast for the projects within the augex categories that we have reviewed in the current section, would be between 45% and 55% less than AusNet has proposed.

## 4.1 Introduction

544. We reviewed the information provided by AusNet to support each of the five augex programs in our scope and as necessary asked clarifying questions, both in writing and at a face-to-face meeting with AusNet representatives. We sought to confirm the need, quantum, and optimal timing of each project that we were asked to review.

545. In the sections that follow, we identify the programs we have been asked to review from AusNet's full list, and then we present our assessment of the individual projects.

## 4.2 Proposed augex by program

546. AusNet proposes augex of $959.9 million in the next RCP as shown in Table 4.1.

*Table 4.1: AusNet proposed augex - $m, real FY2026*

| Program | 2026-27 | 2027-28 | 2028-29 | 2029-30 | 2030-31 | Total |
|---|---|---|---|---|---|---|
| Compliance | 8.1 | 5.8 | 11.9 | 13.1 | 17.1 | 56.0 |
| Connection Enablement | 20.2 | 51.0 | 29.7 | 33.7 | 45.9 | 180.4 |
| Construction insurance | 0.4 | 0.3 | 0.3 | 0.4 | 0.4 | 1.8 |
| Demand Driven Augex | 60.2 | 80.3 | 109.4 | 68.0 | 82.5 | 400.4 |
| DER Integration | 9.5 | 7.3 | 0.0 | 23.6 | 0.0 | 40.4 |
| Innovation | 0.4 | 0.4 | 0.4 | 0.5 | 0.5 | 2.3 |
| REFCL compliance | 0.0 | 0.0 | 14.2 | 28.6 | 33.7 | 76.5 |
| Reliability Improvement | 39.7 | 20.2 | 17.3 | 30.0 | 30.2 | 137.4 |
| Resilience | 12.0 | 9.7 | 7.4 | 6.9 | 6.5 | 42.6 |
| Safety | 5.9 | 7.4 | 4.7 | 2.1 | 2.3 | 22.3 |
| **Total** | **156.3** | **182.4** | **195.3** | **206.8** | **219.1** | **959.9** |

*Source: EMCa table derived from AusNet SCS capex model*

### 4.2.1 EMCa's Scope of Augex Review

547. Table 4.2 shows the AusNet augmentation project amounts that the AER has asked us to review, by driver. In aggregate the projects total $678.4 million, which is approximately 70% of the total proposed augex of $959.9 million.

*Table 4.2: AusNet proposed augex within EMCa's scope - $m, real FY2026*

| Augex within scope | 2026-27 | 2027-28 | 2028-29 | 2029-30 | 2030-31 | Total |
|---|---|---|---|---|---|---|
| Safety | 5.9 | 7.4 | 4.7 | 2.1 | 2.3 | 22.3 |
| REFCL compliance | 0.0 | 0.0 | 14.2 | 28.6 | 33.7 | 76.5 |
| Compliance | 8.1 | 5.8 | 7.8 | 4.8 | 8.8 | 35.3 |
| Connection enablement | 20.2 | 51.0 | 29.7 | 33.7 | 45.9 | 180.4 |
| Demand Driven augex | 52.9 | 73.1 | 102.1 | 60.7 | 75.1 | 363.9 |
| **Total** | **87.1** | **137.3** | **158.5** | **129.9** | **165.8** | **678.4** |

*Source: EMCa table, derived from AusNet SCS capex model*

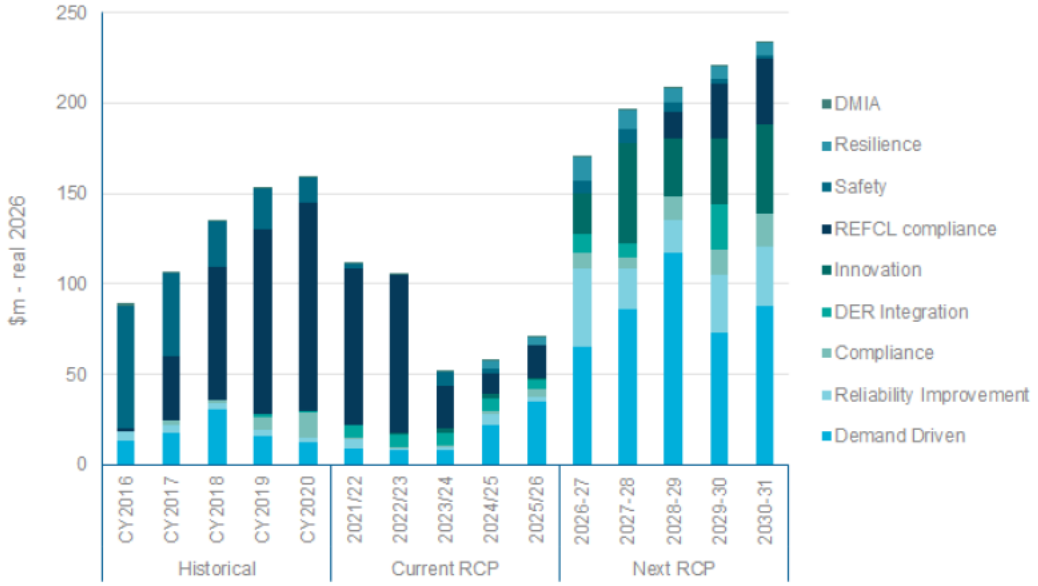
548. The proposed Compliance augex ($35.3m) is for two CER integration projects, which we assess in section 5[99] along with $138.5 million of the proposed Demand-driven augex for LV electrification, therefore totalling $173.7m reviewed in that section. In the current section, we therefore review the other programs, totalling $504.7m and comprising safety, REFCL compliance, connection enablement and the non CER-related demand driven augex.

### 4.2.2 Augex trend

549. AusNet identifies 'new drivers' of expenditure being (i) enabling the connection of large renewable generators, (ii) responding to network resilience challenges in the face of climate change, (iii) compliance challenges, and (iv) forecast new demand. AusNet states that these drivers are contributing to a step increase in its required augex in the next RCP as shown in Figure 4.1.

[99] This comprises the Steady State Voltage Compliance project of $26.9m and the Supply Improvement reactive program of $8.4m, both of which are reviewed in section 5

*Figure 4.1: AusNet augex time series (direct plus overhead) - $m, real 2026*




*Source: EMCa graph derived from AusNet SCS capex model and its response to IR010 – Q03*

# 4.3 Assessment of safety program

## 4.3.1 What AusNet has proposed

550. AusNet has included two programs within its safety program in its proposed augex totalling $22.3 million as shown in Table 4.3. This is in addition to the safety programs included in its repex forecast as discussed in section 3.

*Table 4.3: AusNet proposed safety driven augmentation - $m, real FY2026*

| Safety | 2026-27 | 2027-28 | 2028-29 | 2029-30 | 2030-31 | Total |
|---|---|---|---|---|---|---|
| Early fault detection/broken conductor detection (High consequence areas) | 4.4 | 5.9 | 3.2 | 0.6 | 0.5 | **14.5** |
| Fall arrest systems | 1.5 | 1.5 | 1.5 | 1.5 | 1.8 | **7.9** |
| **Total** | **5.9** | **7.4** | **4.7** | **2.1** | **2.3** | **22.3** |

*Source: EMCa table derived from capex model*

### EFD program includes an ongoing opex component

551. In addition to the above augex program, AusNet has proposed an opex step change for the Early fault detection (EFD) program of $7.8 million as shown in Table 4.4. We consider that there are dependencies across these two programs to consider these together.

*Table 4.4: AusNet proposed of Early fault detection step changes - $m, real FY2026*

| Step change | 2026-27 | 2027-28 | 2028-29 | 2029-30 | 2030-31 | Total |
|---|---|---|---|---|---|---|
| Early fault detection | 1.6 | 1.6 | 1.6 | 1.6 | 1.6 | **7.8** |

*Source: EMCa table derived from AusNet EDRP 2026-31 – Opex Model*

### 4.3.2 Early fault detection

#### What AusNet has proposed

552. AusNet is proposing to install EFD devices on its network in Codified[100] and High Bushfire Risk Areas (HBRA) as part of the bushfire safety program.

553. AusNet has proposed a roll-out of [redacted] devices to be installed on the SWER network in the first three years of the next RCP at a cost of $14.5 million capex. A unit rate of [redacted] ($2024) has been assumed.

554. In addition, AusNet has proposed an opex step change for introduction of early fault detection technology at a cost of $7.8 million for the next RCP. A similar cost would be required every five years, comprising a licensing fee for the software operation of the IT and communications system supporting the operation of the EFD devices.

555. AusNet has provided a dedicated asset management strategy for its EFD program (AMS-137) to consider ways in which technology can be used to manage fire risk from unidentified defects.

556. The proposed EFD program will have 3 stages spread across three separate regulatory periods. Stage 1 (2026-2031), centres on the SWER Network and a portion of polyphase with the key objective of operationalising the attributes library and workflow. Stage 2 and 3 centre on Polyphase Networks and are wholly contingent on the success and viability of stage 1 to achieve operational maturity with the key objective to roll out across the Network as an economic Fire and outage prevention method.[101]

#### Assessment

##### AusNet undertook a concept project in the current RCP

557. The EFD devices detect partial discharges that occur from early signs of a fault (for example deteriorating insulator material, conductor degradation). Data regarding the early signs of fault are communicated to AusNet via the device's inbuilt cellular communications module. As such, the technology helps detect and pinpoint defects (with an accuracy of ±10 metres) in electrical infrastructure before they develop into electrical faults that cause equipment damage, permanent outages, and public safety threats such as fallen wires and bushfires.

558. EFD devices have not been installed previously in Australian distribution networks. AusNet, Powercor/CitiPower, Victorian state government and IND.T have undertaken various trials of EFD devices in Victorian networks. Specifically, AusNet has installed 310 EFD units through various trials across 14 feeders,[102] with the latest trial of the single-wire earth return (SWER) Firesafe EFDs installed across the codified areas.

559. AusNet states that the trials have established these devices can detect latent defects on the network. However, AusNet also states that the data presented by this technology includes a significant number of spurious alerts:

> *'the portal includes substantial numbers of alerts which are not operationally viable to follow up with site visits. More work is required to enhance the alerts and provide confidence in dispatching resources to the site following an alert.'*[103]

##### The driver of the program for the next RCP remains unclear

560. We asked AusNet to clarify the driver of the program, which remained unclear from our review of the provided submission material.

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100 Codified = 'Electric Line Construction Area' as defined within the Electricity Safety (Bushfire Mitigation) Regulations. ELCAs are the highest fire loss consequence areas where insulated medium voltage networks are mandated.

101 ASD - AusNet - AMS-137 - Early Fault Detection - 31012025 - CONF

102 Of these units, the 39 'SWER' units are the oldest and are set to be retired due to the decommissioning of the 3G network.

103 ASD - AusNet - AMS-137 - Early Fault Detection - 31012025 – CONF, page 3

561. AusNet states that some defects cannot be detected using traditional inspection methods. Given its SWER network has a high consequence of fire starts, and that its REFCL network does not cover the SWER network, failure to address these defects could (in rare cases) be catastrophic. Accordingly, it is seeking to mitigate bushfire danger AFAP as it progresses to a mature state with greater deployment providing opportunity to develop the defects attributes library.

562. AusNet has not established an obligation to installed EFD devices on its SWER network. Although, AusNet refers to the requirement to install EFD devices as part of its exemption conditions for the WOTS24 network.

> *'In April 2023, AusNet received a technical exemption from Energy Safe Victoria to isolate a part of the WOTS24 network from REFCL protection using an Isolation Transformer. One condition of this exemption was the requirement to install and operate Early Fault Detection equipment along 193km of the WOTS24 network.'*[104]

563. AusNet has not established a change in risk, that would necessitate the installation of EFD devices on its network, or that its current practices are deficient or not meeting the needs of its overarching regulations. In its AMS, AusNet states:

> *'The inspection programs that AusNet applies to the Network are robust and as far as practicable, effective.'*[105]

564. We checked the draft ESMS that AusNet has presented to ESV, the current approved bushfire management plan (v28) and current DAPR and did not find reference to this program to manage bushfire risks.

### Benefits of the EFD devices remain uncertain

565. According to AusNet's AMS document, the development of this technology appears to have commenced with research by Melbourne University into use of IoT and machine learning for detection of defects from the abnormal radio signatures that they emit.

> *'Off the back of this research –IND Technology patented the EFD technology in 2013 and subsequently was successful in obtaining grants from the Victorian government for trials of EFD devices with AusNet and Powercor. The EFD has proven reliable and effective in identifying defective equipment giving off invisible signals. The EFD is now deployed in countries with similar bushfire challenges to that of AusNet. The United States and Canada have deployed thousands of these units and, given their success, are increasing their programs.'* [106]

566. AusNet describes the function of the system as being able to detect an abnormal radio frequency (RF) signal emitted as a result of a powerline defect. The EFD data collection units (DCU) detect these signals, collect site information and send an alert to the central server to determine the location.

567. AusNet referred us to reports of the trial period, which was also shared with Powercor. We have reviewed this material and conclude that the devices generate a large number of spurious readings which if not adequately filtered led to unnecessary and inefficient truck rolls.

568. We requested a copy of the latest report from the trial project[107] to confirm the source of benefits claimed by AusNet. The trial report was prepared by the vendor IND.T, as a deliverable of the trial and was not, as previously understood, a source of the benefits claimed by AusNet. The report stated that the only EFD systems on SWER were installed over 5 years ago and have since been retired.

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104 ASD - AusNet - AMS-137 - Early Fault Detection - 31012025 - CONF

105 ASD - AusNet - AMS-137 - Early Fault Detection - 31012025 - CONF

106 ASD - AusNet - AMS-137 - Early Fault Detection - 31012025 - CONF, page 6

107 Firesafe SWER EFD Trial Final Report November 2024

569. More recent results support that this technology has the potential to identify defects, however the experience to date is that issues confirmed by inspection did not require urgent attention, and there was no evidence to suggest that the defect would not be raised using traditional techniques.

570. Based on our reading of supporting materials, we determined that there was a high level of spurious alerts generated from these systems which are not able to be actioned. AusNet stated that in the first 6 months of 2024, it had received 10,996 alerts from 300 units. Analysis of alerts is a manual time-consuming process. If all were acted upon, this would result in significant resources to investigate, and worse if expanded to additional devices on the network.

571. By example, AusNet presented the results of its analysis and onsite investigation of alerts on its WOTS24 feeder, which has 37 EFD units installed. The investigations considered 61 locations with varying levels and frequencies of RF discharge. AusNet identified the top 10 priority sites for visual and corona camera inspection, but no anomalies were found. A follow-up inspection was undertaken by the vendor IND.T, which was expanded to 14 sites. The reason for the differing number of sites was not explained, and we assume this included the original 10 sites. Based on our reading of the results, no actionable defects were identified.

572. Despite the significant number of spurious alerts, based on the results of the trial AusNet has claimed that the EFD devices are effective.

573. More revealing are comments included in the AMS that state (emphasis added by EMCa):

> *'AusNet believes the devices have the ability to detect latent defects, but the attributes library and workflow assignment* ***requires significant work to become integrated into 'business as usual' operations.al (sic) and fit for purpose****. A project will be required to develop a robust useable product. It is expected vast increased amounts of data will be required to feed in and with the aid of AI and machine learning the attributes Library can be refined to enable an operational viable application of the product. The project will enhance the attributes Library and provide confidence to AusNet in dispatching resources to the site of an alert. To gather confidence and refine the model the following initiatives need to be enacted.*
>
> *1. A dedicated project team will be required to further enhance the accuracy of the Attributes Library.*
>
> *2. A large volume of devices is required to gather a significant data load required to refine the Attributes Library.*
>
> *3. In-field site inspection tools and skills to enhance latent defect detection rates'*[108]

574. We agree with AusNet's conclusions here, that the devices have proven the ability to pick up RF signatures, however there is insufficient evidence to indicate that the device or surrounding technology is capable of efficiently locating actionable defects. More work is required to develop the product, before such time as the benefits of installing this product can be realised by consumers.

575. We conclude that the nature of this project is R&D and at this time, it does not align with the NER capex objectives.

### Estimated costs are higher than the vendor quotation

576. AusNet has sourced a quotation from the vendor IND.T, for [redacted] for Hardware supply and system commissioning, and [redacted] for a five-year SaaS licence for [redacted] units.[109] This equates to approximate unit cost for supply and installation of [redacted] It is

[108] ASD – AusNet – AMS-137 Early fault dete4ction – 31012025 – CONF, page 12

[109] ASD – AusNet – Quotation early fault detection – 31 Jan 2025 - CONF

unclear if the scope of works was for AusNet, or how the unit cost has been determined that AusNet has relied upon.

577. An assumed unit rate of [redacted] ($2024) for [redacted] units would result in a total cost of [redacted] ($2024) and which is lower than the $12.6 million ($2024) that AusNet has proposed for this program. A further element of [redacted] ($2024) is included but not explained.

### We identified several modelling issues which cast doubt on the reasonableness of the project

578. AusNet states that modelling the benefit is low due to the very low customer density of SWER and given the Probability of Failure is low due to the strong condition of the network. We asked for a copy of the economic model outlining the benefits of this program[110] and were provided with a model that AusNet stated calculates the NPV of the program under different assumptions.

579. The model confirms that the quantity of [redacted] was calculated as 1 EFD device per 3.5km of SWER line, assuming a total of 6,400km of SWER. This appears to align with AusNet's strategy of full coverage of its SWER network,[111] however the 1 per 3.5km ratio is not explained. We suspect this is based on the Trial report by IND.T which estimated a mid-range figure of 3.6km per EFD.

580. The model includes around 120,000 records which we assume are unique assets, however the model is limited to equipment id. Of these 26,349 appear to have been identified as SWER and each have estimated benefits that contributed to the total benefits of this program. The relationship between the 26,349 equipment lines and 6,400km of SWER is not clear to us.

581. AusNet also assumes an effectiveness level of 30% to account for the fact that not all detected defects can be actioned prior to practical failure of the asset. For example, if a tree makes contact with and breaks a conductor, the EFD may detect the defect, but there is no opportunity to prevent the failure. In our discussions during the onsite, we understood that the definition of effectiveness was much broader and related to the ability of the EFD to detect an actionable defect that could result in a failure. Based on the examples provided, we do not consider that this effectiveness is sufficient to account for the results observed from the trial, and in fact the effectiveness of the current solution appears much lower given the level of spurious alerts.

582. We found several modelling issues, which we consider collectively overstate the likely benefits assumed in this model. However, in a further request to explain how the model (EFD sensitivity 2 – CONF) has been used to determine the proposed volume, timing and expenditure. AusNet stated that the model and its results were not relied upon:

> *'The model's main purpose was to demonstrate the NPV amounts under the different scenarios listed above. However, the model has not been used to determine volume, timing or expenditure. The proposal is to cover the entire SWER network in the upcoming RCP. Expenditure is based on quotations from IND-T to cover the entire SWER network, not the results of the model.'*[112]

583. In this latter response we were provided with a model with different unit rates assumed of [redacted] ($2024), and where the difference was not explained.

### Findings

584. We consider that the Early Fault Detection project has not been sufficiently justified.

585. We consider that a program to target the highest risk areas of the SWER is reasonable, however AusNet has not adequately demonstrated that the program as proposed is prudent or efficient. Specifically, we have concerns that the benefits of the EFD devices remain

110 AusNet response to IR009, Question 23

111 AusNet's 2025-2029 DAPR states there are 6,421km of overhead (SWER)

112 AusNet response to IR020 Question 27

highly uncertain and require ongoing development of the technology and associated work practices.

586. Alongside the modelling issues we identified, the absence of documentation that explains and supports the modelling approach and tests the sensitivities of the outcomes is a key weakness of the proposal.

### 4.3.3 Fall arrest system

#### What AusNet has proposed

587. AusNet has proposed the completion of its program to install fall arrest systems (FAS) on its remaining steel lattice towers in the 66kV sub-transmission network at a rate of 18 towers per year. The program includes providing a central ladder on the tower body and installing fall arrest systems.

#### Assessment

588. We asked AusNet to clarify why FAS (which we understand is a level 3 control) are being implemented over the use of EWP (which we understand is a superior level 2 control) for all sites, when EWPs may be suitable for some sites.

589. In response, AusNet stated that the use of EWP or EPV (Elevated Platform Vehicle) is not viable in most scenarios primarily due to access issues. This includes (i) access issues leading to the tower, and (ii) access issues at the tower.

> *'We recognise the recommendations by WorkSafe that EWPs are a better method of access to towers, however where it is not practical to do this, the next level recommended is the permanent fall arrest system which is a level 3 control. The installation of fixed fall arrest systems (FAS) has already been communicated with WorkSafe to comply with the relevant OHS Regulations'*[113]

590. We find the response by AusNet to be satisfactory.

591. There are 465 steel lattice towers in AusNet's 66kV sub-transmission network.[114] In response to our request to provide the historical replacement volumes and expenditure for the current RCP, AusNet states that there are 208 Leg & Ladder FAS installed on its network with capex of $4.5 million since 2017.[115]

592. The proposed program will result in the installation of a fall arrest system on 50 towers in each of the first four years of the next RCP, with 58 towers in the final year, totalling 258.

593. AusNet has applied a unit rate of [redacted] ($2024) and which we consider is within a reasonable range of acceptable costs and comparable to historical spend after taking account of likely price increases since project inception. AusNet stated that the Fall Arrest system project had been deferred out of the current period into the next RCP because it wanted to observe and obtain feedback from its delivery partners on the performance of the installed FAS before commencing on the remaining 258 towers.

#### Findings

594. We consider that the proposed Fall Arrest System project is reasonable.

### 4.3.4 Findings

595. We are satisfied that the proposed capex for FAS is reasonable and reflects a prudent and efficient forecast of the proposed capex.

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113 AusNet response to IR020 question 24

114 AMS Network safety

115 AusNet response to IR020 question 25

596. However, we are not convinced by the analysis presented by AusNet of the benefits of the Early Fault Detection. We consider that the analysis does not justify the proposed capex or opex and that the absence of documentation that explains and supports the modelling approach and tests the sensitivities of the outcomes is a weakness of the proposal.

## 4.4 Assessment of REFCL compliance program

### 4.4.1 What AusNet has proposed

597. Our scope of review includes the review of AusNet's proposed REFCL compliance program, totalling $76.5 million for the next RCP as shown in Table 4.5.

*Table 4.5: AusNet proposed compliance augmentation - $m, real FY2026*

| REFCL compliance | 2026-27 | 2027-28 | 2028-29 | 2029-30 | 2030-31 | Total |
|---|---|---|---|---|---|---|
| REFCL Driven Augmentation | - | - | 14.2 | 28.6 | 33.7 | 76.5 |

*Source: EMCa table derived from capex model*

598. The program includes interventions at four substation sites: SMR, WOTS, WYK and KLK to ensure that the REFCL capacity exceeds the capacitive loading in the network in order to meet the regulations. AusNet has not provided economic analysis of its program due to the mandatory compliance obligation.

### 4.4.2 Assessment of REFCL compliance program

#### AusNet has an obligation to maintain REFCL compliance

599. As stated by the AER in its final decision for the current period:

> *'Following the 2009 Victorian Bushfires Royal Commission, legislative amendments were introduced to reduce the likelihood of bushfire starts from electrical equipment faults. These amendments place regulatory obligations to achieve certain protection performance requirements (referred to as 'required capacity') at 22 of AusNet Services' zone substations. A REFCL is a protection device typically installed at a zone substation used to achieve the required capacity to reduce the risk of faulted power lines starting bushfires.'*[116]

600. Whilst these comments may be read as requiring the establishment of REFCLs at each of AusNet's 22 sites, they equally apply to ensuring that AusNet continues to meet the performance requirements over time as the network changes.

601. During the current period, AusNet has completed tranche 3 of the REFCL project which is the final tranche of the REFCL program and transitioning to on-going REFCL compliance.

#### AusNet has determined the need for intervention at four sites

602. Increasing capacitive current is driving the need to invest in further mitigation efforts to ensure AusNet Services can maintain compliance with the Regulations, referred above as the performance requirements. AusNet has developed network capacitance forecasts based on the characteristics of each zone substation supply area, the standard topology of cables installed for Underground Residential Developments (URDs) and other known network augmentation.[117]

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116 AER - Final decision - AusNet Services distr bution determination 2021–26 - Attachment 5 - Capital expenditure, page 5-13

117 ASD – AusNet – REFCL BC – 31012025 - PUBLIC

603. Whilst this results in step increases as new URDs are commissioned, AusNet develops an indicative annual trend. Constraints are then determined at each of the ZSS locations against the capacitive current limits. The limits may be exceeded at (i) the zone substation 22kV bus, or (ii) along the outgoing ZSS 22kV feeders of the installed REFCL units.

604. Based on its forecast capacitance levels, AusNet concludes that intervention is required at four sites: SMR, WOTS, WYK and KLK.

*Table 4.6: Location of intervention to meet REFCL compliance*

| Location | Preferred option | Technical feasibility | Timing |
|---|---|---|---|
| SMR | Remote REFCL[118] | Remote REFCL on SMR24 will reduce the capacitance on SMR bus 2 by the required amount. Least cost technically acceptable option. | 2028 |
| WOTS[119] | Remote REFCL | Remote REFCL on WOTS25 will reduce the capacitance on WOTS25 by the required amount and is the least cost technically acceptable option.<br><br>Remote REFCL on WOTS Bus 1 will reduce the capacitance on Bus 1 by the required amount and is the least cost technically acceptable option. | 2026 |
| WYK | Installation of Isolating transformer | To reduce capacitance below 80A on WYK24 it is proposed to install 11 x 300kVA isolation transformers over 5 years. | 2026 |
| WYK | Remote REFCL[120] | To reduce capacitance on WYK bus 1 below the 87A limit it is proposed to install a Remote REFCL on WYK13. This will also bring the capacitance on WYK13 below 80A | 2026 |
| KLK | Remote REFCL | To reduce capacitance below 80A on KLK11 it is proposed to install a Remote REFCL on KLK11. | 2026 |

*Source: EMCa derived from ASD – AusNet – REFCL BC – 31012025 - PUBLIC*

605. AusNet does not consider that changes to the network demand forecast will materially impact the outcomes or scope of works of its RECL compliance program.

### AusNet has selected options in each case from suitable set of options to address excessive capacitive charging

606. Depending on the characteristics of the supply system and the substation at which excessive capacitance is forecast, AusNet uses one or more of the following options:

- installation of Isolating transformers
- Remote REFCL
- New Zone Substation.

607. AusNet also included a list of non-credible options that it considered, including capacitance transfer. We asked AusNet to explain specifically why a network configuration option was not considered for these projects, or in combination with other options. In its response, AusNet stated that

118 SMR (Single solution to address both the zone sub SMR bus 2 and feeder SMR24)

119 This site is a Terminal Station (WOTS - Wodonga Terminal Station) – whilst a transmission asset, AusNet 22kV distribution feeders come from WOTS.

120 WYK- Woori Yallock (Single solution to address both the zone sub WYK bus 1 and feeder WYK13)

*'Network reconfigurations were assessed as a potential solution; however, they were deemed not to be a credible option due to one or more of the following constraints:*

- ***Regulatory Compliance:** REFCL-protected networks cannot be transferred to non-REFCL networks due to legislative requirements mandating compliance with bushfire mitigation regulations.*
- ***Capacity Limitations:** The available load capacity on adjacent feeders is insufficient to accommodate the required transfer without exceeding network constraints.*
- ***Capacitance Headroom Constraints:** The receiving network lacks sufficient capacitance headroom, which could compromise REFCL operation.*
- ***Power Quality Considerations:** Transferring load between networks may introduce unacceptable power quality issues, including voltage fluctuations, potentially impacting customer supply reliability.*[121]

608. AusNet's explanations of: (i) the advantages and limitations of each of its solutions options: (ii) its rationale for the selection of the option or combination of options in each of the five substations: and (iii) its response to our questions collectively satisfies us that the prudent option has been selected in each case.

609. On the basis of the descriptions of the options and option selection steps, we consider its forecasting process to be reasonable.

### Estimated costs are high level and within a reasonable range based on previous costs

610. The proposed program is made up of two options across four geographical areas:

- Option 2, installation of isolating 300kVA transformers in the distribution network for WYK24 only at a cost of $4.1 million ($2024) for 11 isolating transformers
- Option 3, remote REFCL
- Installation of a remote REFCL in the distribution network for SMR24, WOTS25, WYK bus1, KLK11 at cost of $12.3 million ($2024)
- Installation of a remote REFCL in the distribution network for WOTS bus1 at cost of $12.3 million ($2024)

611. AusNet directed us to two cost estimates relied upon in developing the forecast expenditure as shown in Table 4.7.

[121] AusNet response to IR009 Question 20

*Table 4.7: P50 cost estimates for REFCL ($2024)*

| Cost category | Remote REFCL | | WYK24 | |
|---|---|---|---|---|
| [redacted] | [redacted] | [redacted] | [redacted] | [redacted] |
| [redacted] | [redacted] | [redacted] | [redacted] | [redacted] |
| [redacted] | [redacted] | [redacted] | [redacted] | [redacted] |
| [redacted] | [redacted] | [redacted] | [redacted] | [redacted] |
| [redacted] | [redacted] | [redacted] | [redacted] | [redacted] |
| [redacted] | [redacted] | [redacted] | [redacted] | [redacted] |
| [redacted] | [redacted] | [redacted] | [redacted] | [redacted] |
| **Total** | **12,275,929** | **100%** | **4,139,808** | **100%** |

*Source: EMCa derived from ASD – AusNet - Direct Cost Summary - General Remote REFCL – Confidential and REFCL WYK ZSS – Copy - CONF*

612. The costs have a heavy component of contracted works and we expect that AusNet's history of REFCL installation should allow estimation at a high level of accuracy.

613. The estimates provided to us are high level only. For the Remote REFCL the estimate was labelled indicative. We note there are material items that do not appear to align with the scope, including:

- Other (P50) which we have labelled as a risk allowance in Table 4.7, calculated as 8% of the total. A similar item was removed from the WYK24 cost estimate, totalling $0.91 million (and which is in addition to other cost allowance items).
- Seed funding of [redacted] and VCR estimate costs of [redacted] both marked with the comment 'is this required.'

614. We checked the cost allowances included in the revised regulatory proposal for the current RCP and found the scope for the BGE project to be broadly similar, as it required Remote REFCL, load transfer and isolation transformers at a cost of $9.9 million.[122] Other compliance projects and the tranche 3 works did not have a similar scope, nor did we have access to the cost estimates. We assume this was developed in $2018, consistent with the input to its capex model. Adjusting to be on the same basis as the cost estimate used for the next RCP the comparison cost would increase to approximately $11.7 ($2024), noting the slight difference in scope. When AusNet's proposed cost is adjusted to remove additional items, this figure is within a reasonable tolerance of the estimates included in the forecast.

### AusNet's proposed project timing reflects deferring timing

615. The optimal timing of work is very dependent on assumptions surrounding the development of the electricity network, including new subdivisions and specifically underground cable extensions.

616. We have reviewed the capacitance forecasts provided by AusNet.[123] We noted that the proposed timing of the interventions is planned later in the next RCP (years 3 to five) than the timing from its forecast model would suggest, with the majority of interventions due by 2026 based on when the forecast capacitance exceeds the stated limit. This earlier timing would suggest commencement in the current RCP.

617. We queried the potential disconnect between the timing indicated by the capacitive current forecasts at a bus level or feeder level appear to exceed the limits, and the proposed capex

122 AusNet Services – Revised Regulatory proposal – 2021-26 – AMS 20-406 – BGE REFCL Compliance maintained Planning Report – December 2020

123 Hardcoded data included in EDPR FORECATS_V1_with worst case damping value – PUBLIC, and IR009 Q18

timing. Specifically, where the data indicated that the capacitive current may be exceeded at some locations. In its response to our question, AusNet stated that

> *'The values presented in the tables above (in response to Question #18) represent the forecast projections for the period 2026 to 2031. There are no identified instances of ESV non-compliance due to high capacitance. REFCL compliance is assessed by Energy Safe Victoria (ESV) based on field test results.*
>
> *For the majority of the identified projects, capacitance levels are projected to exceed the prescribed limits by 2026. As a result, these projects will commence design and construction immediately upon approval by the AER to ensure their completion and commissioning as soon as possible.'* [124]

618. We explored this further during our onsite discussion. When asked how AusNet meets its obligations, noting the exceedance of capacitance levels, we were advised that AusNet undertakes operational measures to ensure that the network capacitance levels are not exceeded. As the limits being monitored occur during the summer months, and when 'fire mode' is activated, AusNet undertakes manual monitoring and switching during 'fire season' to ensure that capacitance limits are maintained.

619. We noted that the REFCL works in the current period, were also delivered later in the period than planned. We were advised this was due to delays in approvals and not related to AusNet's delivery capability.

#### Additional observations

620. We observed that the network capacitance forecasting methods employed by AusNet and Powercor differ. In its final decision for AusNet, AER stated:

> *'Powercor and AusNet Services used different approaches to forecasting capacitive charging current. Ongoing compliance was a significant component of the REFCL forecast capex. This is due to the forecast growth in network capacitance, primarily driven by growth in underground networks with no bushfire risk. We will closely consider these forecasts compared to the actual capacitance at the next reset if required. We encourage the distributors to continue considering alternative options and exploring possible exemptions to lower costs for consumers for neutral or improved bushfire-risk outcomes.'*[125]

621. We were not made aware of any issues by ESV in meeting its compliance obligations, associated with forecasting network capacitance levels.

### 4.4.3 Findings

622. We consider that the proposal to address requirements at four sites as part of AusNet's proposed REFCL compliance program is reasonable.

623. We consider that the forecasting process applied by AusNet is reasonable, the solutions reflect a reasonable estimate of its requirements and AusNet has taken reasonable steps to defer the augmentation. However, we consider the application of the risk allowance and additional costs contributes to a higher than efficient cost.

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124 AusNet response to IR009, Question 19

125 AER - Final decision - AusNet Services distr bution determination 2021–26 - Attachment 5 - Capital expenditure, page 5-19

# 4.5 Assessment of Connection Enablement projects

## 4.5.1 What AusNet has proposed

624. As shown in Table 4.8, AusNet proposes $180.4 million capex during the next RCP on four projects to provide capacity on parts of the 66kV network to enable connection of prospective new large renewable generators (wind and solar).

*Table 4.8: AusNet proposed connection enablement augex - $m, real FY2026*

| Connection Enablement | 2026-27 | 2027-28 | 2028-29 | 2029-30 | 2030-31 | Total |
|---|---|---|---|---|---|---|
| Wodonga – Barnawartha<br>WOTS 66kV Loop: Build new WO-BWA 2nd 66kV Line | 8.7 | 26.4 | - | - | - | **35.1** |
| Morwell East stage 1<br>MWTS East 66kV Loop - Stage 1: MWTS-TGN Lines Upgrade | 1.7 | - | - | - | - | **1.7** |
| Morwell East stage 2<br>MWTS East 66kV Loop - Stage 2: MWTS-SLE-MFA Lines Upgrade | 0.2 | 1.9 | 5.8 | 3.6 | 3.6 | **15.1** |
| Morwell South<br>MWTS South 66kV Loop: MWTS-LGA Lines Upgrade | 9.6 | 22.7 | 23.8 | 30.1 | 42.3 | **128.5** |
| **Total** | **20.2** | **51.0** | **29.7** | **33.7** | **45.9** | **180.4** |

*Source: EMCa table, derived from AusNet SCS capex model*

## 4.5.2 Assessment - forecasting methods

### Selection of augmentation projects

#### Proactive investment for connection of generators in the distribution network has not been done in the NEM

625. AusNet acknowledges that proactive investment in distribution networks to accommodate (prospective) embedded generation is new to DNSPs.[126] However, it cites alignment of its proposed subtransmission network augmentation to the revised National Electricity Objective, with its inclusion of an objective to meet emission reduction targets, as a basis for its approach.

626. As outlined in section 1, we have assessed the proposed expenditure in accordance with the requirements of the NER capital expenditure criteria (refer to Figure 1.2) and the NER capital expenditure objectives (refer to Figure 1.3). We have taken particular note of the economic analyses undertaken by AusNet, including the input assumptions (costs and benefits) and the steps taken to ensure optimal timing of the proposed expenditure. We have not provided an assessment or opinion on the regulatory treatment of the proposed expenditure under the NER.

#### The four proposed connection enablement projects are at various stages of RIT-D

627. Table 4.9 shows the status of the three projects with respect to the RIT-D process and one (WOTS 66kV loop) in the RIT-D process. Two of the four projects are in the delivery phase with completion scheduled for 2027.

126 AusNet EDPR Onsite Workshop - Day 2 Pack CONF, slide 50

*Table 4.9: RIT-D status of AusNet's connection enablement projects*[127]

| Project | PSCR / OSR | PADR / DPAR | PACR/ FPAR / BC | Delivery Phase | Target completion |
|---|---|---|---|---|---|
| MWTS East 66kV loop - stage 1 MWTS-TGN line upgrade | ✓ | ✓ | Approved * | Underway | 2027 |
| MWTS East 66kV loop - stage 2 MWTS-SLE-MFA lines upgrade | Not started | | | | 2030 |
| MWTS South 66kV loop: MWTS-LGA lines upgrade | ✓ | ✓ | In progress | Not started | 2030 |
| WOTS 66kV loop: build new WO-BWA 2nd 66kV line | ✓ | ✓ | Approved* | Underway | 2027 |

*Source: AusNet EDPR Onsite Workshop – Day 2, slides 62-65; AusNet website; ✓ = published*
** internal approval to proceed (i.e. by AusNet)*

### The concentration of connection enquiries and applications broadly aligns with the proposed projects to increase capacity

628. Figure 4.2 shows the connection enquiries received by AusNet geographically. The majority of connection enquiries are from solar and battery proponents. The highest concentration of enquiries is in the vicinity of the Morwell Terminal Station (MWTS), leading AusNet to progress three of the four connection enablement projects in that area.[128] AusNet also proposes a connections enablement project in the area supplied by Wodonga Terminal Station (WOTS).

629. The target areas in which AusNet has chosen to invest align to the concentration of (i) volume of preliminary connection enquiries, and (ii) connection applications:[129]

- Morwell East: 1,360 MW of enquiries, 310MW of which are subject to connection applications
- Morwell South: 860MW of enquiries (the second highest), none of which have progressed to the connection application stage, and
- Wodonga-Barnawartha: 390MW of enquiries, with 80MW of connection applications (the second highest).

630. The connection enquiries broadly align to the solar and wind potential 'build capacity' determined by AusNet.[130]

### Connection at 66kV appears less expensive than at higher voltages, enhancing prospects for proponent enquiries progressing to connection

631. AusNet states that the four projects will unlock 950MW of additional capacity at $0.21 million per MW, which it claims to be '*significantly less than the $0.54-$5.5 million for other solutions.*'[131] Ultimately it will be a commercial decision for the large-scale renewable energy generation proponents to decide where and at what voltage to connect.

127 Project Specification Consultation Report (PSCR), Project Assessment Draft Report (PADR), Project Assessment Conclusions Report (PACR), Options Screening Report (OSR), Draft Project Assessment Report (DPAR), Final Project Assessment Report / Business Case (FPAR/BC)

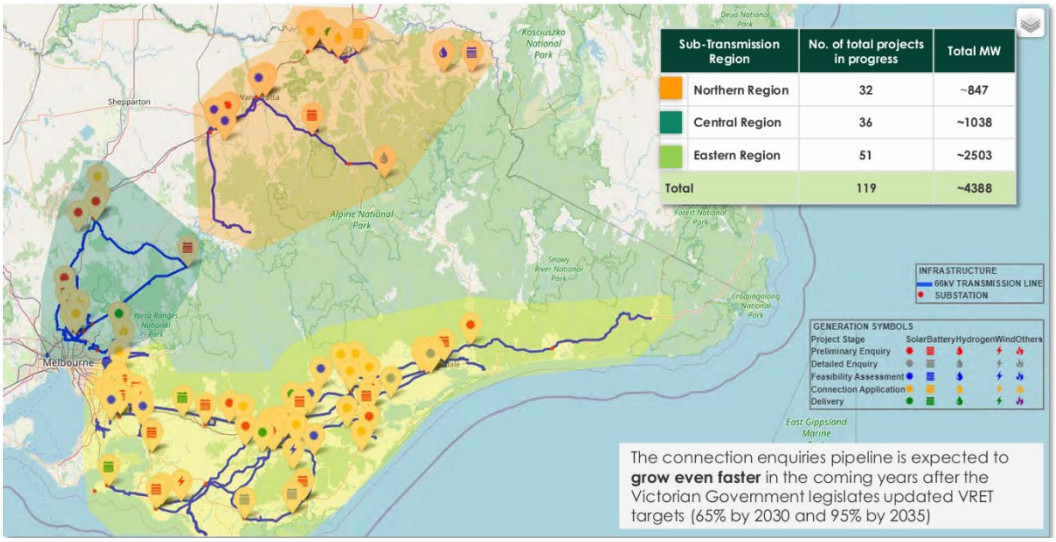
128 That is, MWTS East Stages 1 and 2; MWTS South

129 ASD - AusNet - Large renewables enablement program - 310125 – PUBLIC, Table A1

130 AusNet EDPR Onsite Workshop – Day 2, slide 53

131 AusNet EDPR Onsite Workshop – Day 2, slide 55

*Figure 4.2: Distribution connection enquiries pipeline (to March 2025)*




*Source: AusNet EDPR Onsite Workshop – Day 2, slide 52*

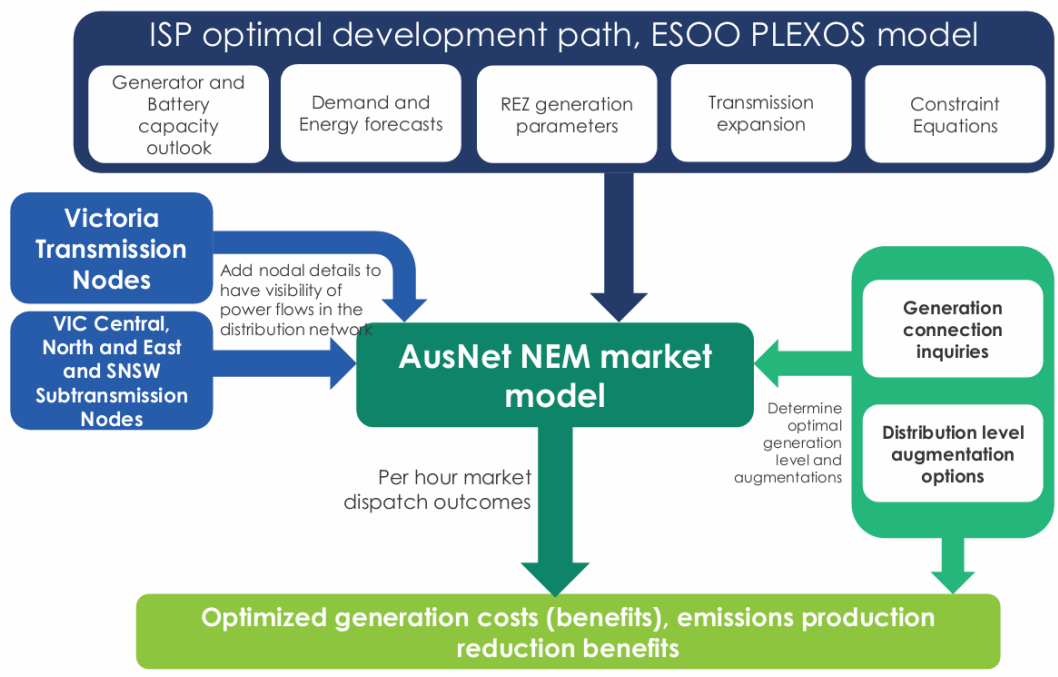
### Modelling approach

632. Figure 4.3 shows diagrammatically AusNet's market modelling approach which is the cornerstone of its cost-benefit analysis that it uses to determine the optimum timing and target capacity enhancement in the most prospective locations.

633. The output of AEMO's PLEXOS energy market simulation model is an input to AusNet's NEM Market model and whilst familiar to us, both the AEMO model and AusNet market models represent a 'black box' for the purposes of assessing the proposed projects. Nonetheless, we spent considerable time during a meeting with AusNet representatives to understand the inputs to and outputs from its model. We also followed-up with additional questions to confirm our understanding.

634. AusNet states that it has identified the locations with the highest renewable generation connection enquiries and derived from its model the 'optimal' MW of generation to maximise benefits of those connections. The benefits are derived from reduced generation costs and reduced generation emissions by displacing assumed non-renewables generation. AusNet then matched augmentation options to alleviate constraints to enable connection of what it considered to be the optimal generation.

*Figure 4.3: Overview of AusNet's market modelling*




*Source: AusNet EDPR Onsite Workshop – Day 2, slide 56*

### Market benefits are assumed by AusNet to accrue for 45 years

635. We asked AusNet for an explanation of the basis for its assumption that the market and emissions benefits would continue to accrue for 45 years. Our concern is that with the strong government-backed drive to replace non-renewable generation from the NEM, that the claimed benefits from off-setting such generation would reduce over time.

636. We summarise AusNet's response as follows:[132]

- For the economic assessment ,a period of 45 years was considered as it is the average life of primary assets
- After some time, the benefits of replacing high-cost fossil fuel generation would gradually decrease as the high-cost fossil fuel generation retires and its analysis assumes there are minimal residual benefits in the later years of the asset's life, and
- For most of the proposed projects we observed that the project becomes cost beneficial within first 10 years.

637. AusNet's response regarding the projects becoming 'cost beneficial' within the first 10 years is only true if sufficient generation progresses to connection status at the locations designated within the next three to four years. We discuss our concerns about the uncertainty with the assumed generation connections below. We therefore remain of the view that benefit streams should not be assumed to persist at the levels that AusNet has assumed for 45 years or even for 10 years beyond connection.

### Modelled benefits rely upon a large proportion of connection enquiries progressing rapidly to connections

638. AusNet's modelling of benefits relies upon a large proportion of the 'pipeline' of connection enquiries progressing to actual connections, within a timeframe in which there is a net benefit to do so. In our experience there are a lot of variables that influence a proponent's intent to connect and its capability to connect (e.g. including access to finance). Factors

132 AusNet IR009 Consolidated response, question 31 (ii)

such as timing, location, unit size, and plant operational characteristics are other variables that ultimately will determine the market and emissions benefits.

639. AusNet does not have control of these variables and has sought to mitigate the impacts of uncertainty through sensitivity analyses, which is reasonable but renders conclusions entirely dependent on interpretation and understanding of the uncertainty ranges for the various input parameters.

#### Generators can connect if capacity is constrained

640. It appears that the counterfactual assumed by AusNet's modelling is that unless AusNet builds spare capacity in advance of fully committed, fully financed generators, they will not connect in their preferred locations.

641. However, new renewable generator connections can and do occur with constrained access. This is a commercial decision for each generator proponent and to an extent undermines the assumption that AusNet is making that connection will not occur and therefore no benefits will accrue even if there is not fully unconstrained capacity at all times.

#### Risk of transfer of benefits between transmission and distribution connection of renewable generators

642. At the on-site we explored AusNet's assumption that there would be no transfer of market benefits between the connection of renewable generation at the transmission level in the ISP (and as modelled in the PLEXOS model) for projects that eventually connect *instead* at 66kV. We also asked whether AusNet had discussed its modelling assumptions with AEMO to help confirm the appropriateness of its assumptions, and our understanding is that it had not but intended to do so in the near future. In our view, confirmation from AEMO about the appropriateness of AusNet's modelling with respect to ISP assumed benefits is necessary to provide confidence in AusNet's benefit analyses.

### Non-network solutions

#### Non-network solutions are unlikely to be credible alternatives to network augmentation for adding capacity for new generation

643. AusNet has followed the RIT-D process for two of the four projects and the RIT-T for the other,[133] which, among other things, requires the DNSP to identify the opportunities for non-network alternatives to the preferred network augmentation option (which in turn is based on cost-benefit analysis).

644. AusNet advises that in each case, it received no non-network options/submissions in response to the Project Specification Consultation Report (PSCR) and on that basis concluded in each case that there are no credible non-network options to address the identified need. However, we consider that this is not a relevant consideration for a 'need' which is specifically to provide an unconstrained network connection for a generator. The alternatives to providing the proposed network augmentation comprise the full set of locations under consideration by generators for their projects, across the NEM.

## 4.5.3 Assessment - Wodonga - Barnawartha

### What AusNet has proposed

645. The Barnawartha zone substation (BWA) is connected to the Wodonga zone substation (WO) via a single 16.6km 66 kV feeder. AusNet advise that there is little capacity in the network to connect any of the prospective new generation estimated to be 390MW.[134]

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133 As of this time, AusNet had not commenced the RIT-D process for the proposed MWTS East 66kV loop - stage 2 MWTS-SLE-MFA lines upgrade

134 5MW in delivery, 80MW connection applications, 20MW in feasibility assessment; 65MW detailed enquiry,220MW preliminary enquiry

646. To provide 180MW of unconstrained capacity to BWA to enable supply to potential large-scale renewable generation, AusNet proposes (i) commissioning the WOTS spare transformer and (ii) adding a new WO-BWA 66 kV line in parallel with the existing line by 2027 at a cost of $35.1 million in the next RCP.

647. The Project Assessment Conclusions Report (PACR) for the project was published in December 2024, the project has received internal approval, and the project is in the delivery phase, with more than 50% of the total project cost of $80.4 million ($2024) expected to be spent in the current RCP.

### Assessment

#### BWA does not have the capacity to supply more large-scale renewable generation

648. The rationale behind AusNet's consideration of network augmentation in the WOTS supply area is that:

- There is 52 MW of existing large-scale generation connected at WOTS
- 370 MW of the 390 MW of renewable generation connection enquiries would, as proposed, be connected to BWA. The WO-BWA 66kV line has a summer rating of 64 MVA, and
- The single radial line has relatively low reliability.

#### There is only 5MW of connections in the delivery phase with 80MW in the connection application phase

649. Whilst there is a total of 390MW of 'interested' renewable generators in the pipeline, 220MW is in the preliminary enquiries stage and it is very uncertain how much if any will progress to connection application.

650. Even at the 'other end of the 'pipeline', the financeability of the 80MW of connection applications is unclear – that is, it is not clear from the information provided that the full 80MW is likely to connect. We assume that the 5MW in delivery phase can connect unconstrained because of existing spare capacity.

651. In our view AusNet's planned pre-emptive investment in 180MW generation capacity may be premature given the uncertainty in actual generation that may/will connect by 2027 or thereabouts (i.e. the planned commissioning date). Nonetheless, there appears to be some prospect for up to 180MW of generation connecting sometime in the next decade.

#### AusNet evaluated four network augmentation options[135]

652. AusNet evaluated the following network options through the PADR, selecting Option 4, which has the highest capital cost and the highest NPV:[136]

1. Commission the WOTS spare transformer and augment the existing WO-BWA 66 kV line with 19/4.75 AAC conductor ($65.1 million capex, NPV $35.8 million, $2024)
2. Commission the WOTS spare transformer and augment the existing WO-BWA 66 kV line with 37/3.75 AAC conductor ($65.6 million capex, NPV $116.7 million, $2024)
3. Commission the WOTS spare transformer and add a second circuit to the existing WO-BWA 66 kV line ($76.3 million capex, NPV $126.6 million, $2024)
4. Commission the WOTS spare transformer and add a new WO-BWA 66 kV line in parallel with the existing line ($80.4 million capex, NPV $127.9 million, $2024).

653. AusNet states that the augmentation will enable connection of 180MW of the 390MW aggregate connection enquiries.

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135 AusNet also identified a fifth and sixth option – the fifth is similar to Option 4, but as it had a materially higher cost, it was not progressed; the sixth option was to deploy dynamic line rating, but this was deemed to be insufficient to address the identified need; we consider AusNet's position to be reasonable

136 ASD - AusNet - WOTS-BWA PACR - 310125 – PUBLIC, pages 3, 11-12; ISP Step Change Scenario

### The difference between the NPVs of Options 2, 3 and 4 is relatively small with the results very sensitive to the number of new generation connections

654. We discuss the key modelling assumptions in section 4.5.2 and which underpin market impact, emissions reduction, and reliability improvement benefits.

655. The NPVs of Options 2, 3 and 4 vary by less than 10% ($11.2 million) with the cost of the options varying by 23% ($14.8 million). The three options each provide a path to removing the WO-BWA constraint and increasing 66kV connection capacity. The higher NPV of Option 4 is due to:

- An increase in the rating of the interconnection of 79MVA (to 143MVA) compared to +54 MVA for Option 2 and +64MVA for Option 3, increasing the potential to support new generation, and
- A likely improvement in supply reliability, although as revealed in the economic modelling, the contribution of improved supply reliability (in probabilistic terms) is trivial compared to the market and emissions benefits.[137]

656. Unsurprisingly, AusNet's sensitivity analysis shows that the positive NPV for all options is very sensitive to the generation connected – for Option 4:

- 10% reduction from the assumed Generation connected base case reduces the NPV by 85%[138] - the Base generation is 'optimal MW of generation' determined from AusNet's modelling, as discussed in section 4.5.2; in this case it is 180MW, and
- 10% increase from the assumed Generation connected base case reduces the project NPV by 60%.

657. Again, as discussed in section 4.5.2, this indicates that the viability of the project is strongly dependent on how much of the prospective generation actually connects:

- Although it was not readily able to be determined from AusNet's model, it is reasonable to assume that a variance of -20% of generation connected to WOTS (i.e. -36MW/144MW total) with or without other unfavourable variances, may render the project uneconomic
- AusNet's NPV requires benefits from FY37 to FY72 to be positive, noting that after 10 years the base case NPV is negative.

#### Findings

658. We consider that AusNet's proposed investment is not sufficiently justified.

659. AusNet has followed the RIT-T process and is proceeding with the appropriate technical solution and at what is likely a reasonable cost because it *'is expected to maximise the present value of the net economic benefit to all those who produce, consume and transport electricity in the NEM.'*[139]

660. However, the selected option is very sensitive to the amount of generation that ultimately connects and the market benefits that will, over time, accrue to the project, particularly post 2037 in this case. As discussed in section 4.5.2, there is considerable uncertainty about the quantum of these benefits.

## 4.5.4 Morwell East Stage 1

#### What AusNet has proposed

661. AusNet has received connection inquiries for 1,360 MW of renewable generation to the Morwell 66 kV network, which already has 123.1 MW of connected generation. The Morwell

137 ASD - AusNet - WOTS-BWA Economic model - 31012025 - PUBLIC

138 Estimated from reference to Figure 1, ASD - AusNet - WOTS-BWA PACR - 310125 – PUBLIC, which appears to be for the ISP Step Change Scenario; from the model provided, the reduction in NPV for ISP Progressive Change scenario (-10% generation case) is from $66.6m to $11.0m, which is approximately the same, at -83%

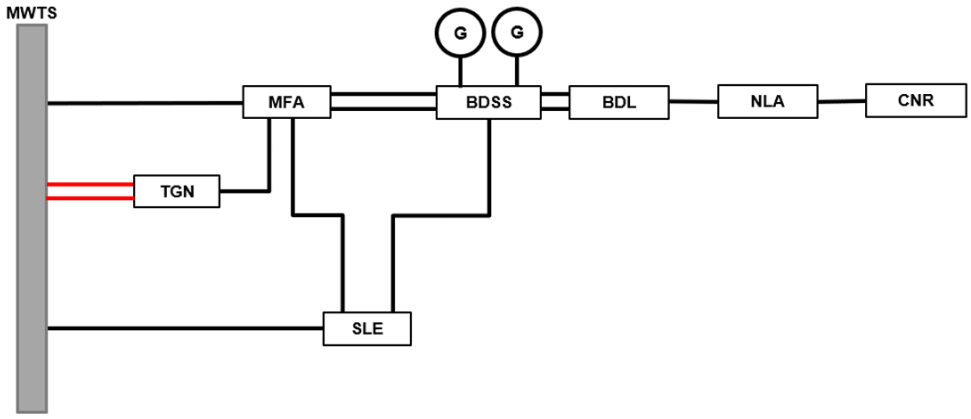
139 ASD - AusNet - WOTS-BWA PACR - 310125 – PUBLIC, page 19

East sub-transmission network does not have sufficient capacity to connect significant additional renewable generation. The identified need is to enable more renewable generation in the Morwell East network.

662. A project to replace lower-rated sections of the two 66kV lines between Morwell Terminal Station (MWTS) and Traralgon zone substation (TGN) with higher rated conductor to provide 250MW more transfer capacity as shown in Figure 4.4. The estimated project cost is $7.1 million ($2024) with $1.7 million to be incurred in the first year of the next RCP, noting that the project is underway.

663. AusNet is also proposing augmentation of TGN-MFA (refer to section 4.6.2) and of the SLE-MFA 66kV line in the next RCP.

*Figure 4.4: Morwell East sub-transmission network augmentation – stage 1*




*Source: ASD - AusNet - Large renewables enablement program - 310125 – PUBLIC, Figure 11*

## Assessment

### Morwell East sub-transmission network does not have sufficient capacity to supply prospective renewable generation

664. Of the 1,360 MW of renewable generation connection enquiries, a 77 MW solar farm has commitment to proceed and an 80MW solar farm is in an 'advanced stage'.[140]

665. The MWTS-TGN No.1 line rating is 39.4 MVA, constraining parallel operation with the No.2 line (91.45 MVA), and creating a bottleneck for connecting new generation in the vicinity of TGN at 66kV.[141] AusNet states that '*only a portion of the proposed generation connections could be accommodated by the existing assets, and the output of the connected generation would have to be curtailed during peak generation due to the constraints of the network.*'[142]

### The connections pipeline status suggests there are reasonable prospects for the 250MW extra capacity to be utilised within the next RCP

666. The applications pipeline for Morwell east is stronger that for the Wodonga-Barnawartha and Morwell South areas, with 310MW of generation in the Connections application phase in late 2024. Despite the lack of clarity regarding the financial status of these projects and developments since, we consider that with a further 245MW of projects in the 'detailed enquiry and Feasibility assessment' phases, there is, overall, reasonable prospects for the 250MW of new capacity to be utilised within the next five years. In our view, despite the uncertainties of the net benefit streams attributed to the projects, the uncertainty is the least of the four projects we are reviewing.

140 ASD - AusNet - MWTS-TGN FPAR - 310125 – PUBLIC, page 6

141 The summer ratings of MWTS-MFA and MWTS-SLE lines are 73.73 MVA and 90.31 MVA

142 ASD - AusNet - MWTS-TGN FPAR - 310125 – PUBLIC, page 7

### AusNet evaluated three network augmentation options and is likely to have made the prudent selection if new generators connect in sufficient quantity

667. AusNet evaluated three network options, selecting Option 2 as it has the highest NPV:

1. Replace lower-rated sections of MWTS – TGN No.1 66kV line with 19/4.75 conductor ($4.4 million capex, NPV $88.3 million, $2024)
2. Replace lower-rated sections of both MWTS – TGN 66kV lines with 19/4.75 conductor ($7.1 million capex, NPV $93.3 million, $2024)
3. Replace both lines with MWTS – TGN both lines with 37/3.75 conductor ($34.9 million capex, NPV $79.7 million, $2024).

668. The preferred option enables an additional 250MW of renewable generation, which AusNet has determined to be the optimal amount.

669. AusNet received no proposals for non-network solutions in response to the OSR. A fourth network solution also involving uprating line sections was considered but superseded by the revised Option 1 shown above. AusNet also rejected the option of relying on dynamic line ratings because the rating improvement was not sufficient.

670. We consider that the preferred Option 2 is the prudent network augmentation choice.

### The difference between the NPVs of Options 1, 2 and 3 is not large with the preferred Option 2 having the highest NPV

671. The NPVs for the three augmentation options vary by less than 10% between the integrated system plan (ISP) Progressive Change and Step Change scenarios.

672. However, the NPV for the preferred Option 2 varies significantly if the generation connected varies from the base case 'optimal' level of 250MW:[143]

- A 10% reduction in generation connected (-25MW) reduces the NPV by about 40% (to $55 million) and changes the preferred option to Option 1
- A 10% increase in generation connected (+25MW) increases the NPV by about 19%.

673. The economic model AusNet provided does not enable us to test at what point the NPV for Option 2 becomes negative. It may be that the 'committed' two solar farms referred to above with combined outputs of 157MW may be sufficient to keep the project NPV positive with AusNet's modelling assumptions.

674. However, as discussed in section 4.5.2, the project NPV is very dependent on assumed market benefits beyond 2036.

### Removing the constraints in the MWTS – TGN will help meet demand growth and avoid voltage collapse in the East Gippsland 66kV loop

675. Our understanding is that the relatively low 39.4MVA rating of the MWTS-TGN #1 line will lead to load shedding if either the MWTS-TGN #2 line, MWTS-MFA line, or MWTS-SLE line is out-of-service during peak times.[144] It is our further understanding that the proposed project to uprate the MWTS-TGN #1 line is likely to reduce the load shedding required in case of outages of one of the these three other 66kV lines.

### Findings

676. We consider that the expenditure proposed in the next RCP is reasonable.

677. The project is in the delivery phase and is proposed to be completed in FY27. AusNet has selected Option 2, which is expected to maximise the NPV. Whilst there remains uncertainty regarding the extent of renewable generation, load demand, and economic benefits that will accrue to the proposed project, it appears the project is likely to satisfy the capex criteria because:

143 ASD - AusNet - MWTS-TGN FPAR - 310125 – PUBLIC, Figure 1

144 ASD - AusNet - East Gippsland 66kV loop augmentation BC - 31012025 – PUBLIC, Contingency step 1, Appendix B

- Two large solar generation projects are likely to connect within the next 2-3 years
- There is a significant pipeline of renewable energy projects that may progress to connection in the vicinity of TGN
- The line uprate is likely to reduce unserved energy in the East Gippsland loop over time, and
- AusNet has completed the RIT-D process with its proposed option favoured from those evaluated.

### 4.5.5 Morwell East Stage 2

#### What AusNet has proposed

678. AusNet's proposed stage 2 augmentation is to upgrade the MWTS – Sale (SLE) – Maffra (MFA) 66kV line to enable 300MW of additional renewable generation to connect to the network in the vicinity of Sale without operating constraints. The estimated capital cost is $15.1 million in the next RCP (with approximately $0.5 million capex in the current RCP). It is scheduled to be completed in FY2031.

#### Assessment

##### Two other augmentation projects have been proposed by AusNet but with uncertainty about future generation connections, demand increases and constraints

679. This project is proposed as an extension to the capacity provided by Stage 1 and is scheduled to follow the proposed augmentation of the TGN-MFA 66kV line, discussed in section 4.6.2.

- The MWTS East 66kV stage 1 which is underway increases the connection capacity for renewable generation by 250MW at TGN by 2027.
- The MFA-TGN upgrade project, to be commissioned in 2029, addresses thermal and voltage collapse limitations with projected demand growth.

680. AusNet states that:

> *After MWTS – TGN and TGN – MFA augmentations, MWTS – SLE – MFA sections… become the constraining elements to accommodate more renewable generation to the Morwell East network.*[145]

##### AusNet evaluated three network augmentation options and is likely to have made the prudent selection if new generators connect in sufficient quantity

681. AusNet evaluated three network options to address constraints to connection of new generators at Sale zone substation (SLE), selecting Option 1 as it has the highest NPV:

1. Augment existing MFA – SLE line with 19/4.75 AAC conductor to achieve 100.7 MVA summer rating ($13.7 million capex, NPV $25.9 million, $2024)
2. Add new 19/4.75 line in parallel with existing MFA – SLE line to achieve 101 MVA summer rating ($28,4 million capex, NPV -$18.2 million, $2024)
3. Augment the existing MFA – SLE line with 37/3.75 AAC conductor to achieve 118 MVA summer rating ($13.8 million capex, NPV $4.8 million, $2024).

682. Each of the three option scopes include uprating the MWTS-SLE line section to achieve 100.7 MVA rating.[146]

145 ASD - AusNet - MWTS East Stage 2 Business case - 310125 – PUBLIC, page 5

146 ASD - AusNet - MWTS East Stage 2 Business case - 310125 – PUBLIC, pages 9, 10, 12

### The difference between the NPVs of Options 1, 2 and 3 is large with the preferred Option 1 having the highest NPV

683. The Option 1 NPV is much greater than that of the other two options evaluated by AusNet, so this is our focus.

684. The Option 1 benefits are estimated to be $35.3 million (PV, 2024) accrued over a study period of 50 years and rely heavily on the assumed benefit streams from emission reductions and market benefits. However, it is clearly the superior option from those considered.

### Sensitivity analyses do not include variation of the assumed connected generation

685. Whilst AusNet has provided an economic model which includes sensitivity analyses of the discount rate and project cost, it does not include an analysis of the NPV variance with lower or higher generation connection.

686. Based on the results of the other connection enablement projects for which this information has been provided, it is reasonable to assume that this project's NPV would also be very sensitive to the MW of new renewable generation that actually connects, where the generator(s) are located, and their operating characteristics. Even a 10% reduction from the assumed optimal capacity of 300MW is likely to reduce the NPV considerably and, as we have noted in the other connection enablement projects, the positive NPV is also strongly reliant on benefits well beyond 2031 (i.e. after the assumed connection), for which there is considerable uncertainty.

### The basis for the timing of the project is unclear

687. AusNet nominates connection by 2030 in its business case, but considerable expenditure is incurred in 2031[147] – we assume therefore that the project is mooted to be in place by the summer of 2030/31 (i.e. in calendar year 2030).

688. The is no compelling rationale for the timing provided in the business case other than what we assume is the time by which AusNet considers there will be sufficient connection applications around SLE to justify the investment. This appears to be speculative.

#### Findings

689. We consider that the proposed expenditure is not sufficiently justified.

690. The project is proposed to be completed in FY2031. AusNet has selected Option 1, which is expected to maximise the NPV, which is in accordance with the RIT-D process.

691. However, there is considerable uncertainty for the need for this project in the next RCP, with the uncertainty arising from the following sources:

- The selected option is very sensitive to the amount of generation that ultimately connects to SLE and the timing of it
- The impacts of demand growth and the quantity and characteristics of renewable generation that may connect to TGN or MFA are also uncertain
- The market benefits that accrue beyond the first 10 years of the project.

## 4.5.6 Morwell South

#### What AusNet has proposed[148]

692. A total of 523.7 MW of embedded generation capacity is installed on the AusNet sub-transmission and distribution networks connected to Morwell Terminal Station (MWTS) of which 277.4 MW is large-scale embedded generation (the balance is rooftop solar). The Morwell South network has 146.36 MW of the large-scale connected generation. AusNet

147 ASD - AusNet - MWTS East Stage 2 Business case - 310125 – PUBLIC, Table 4

148 CE MWTS South_DPAR

has received another 860 MW of large-scale generation connection inquiries to connect to the Morwell South network. There is little capacity in the network to connect any of the prospective new generation (without constraint), with the constraint being the lower-rated of the two 59 km MWTS-Leongatha (LGA) lines.

693. To provide more capacity to the Morwell South network, AusNet proposes replacing the conductors of both MWTS-LGA 66kV lines with a higher rated conductor (37/3.75 AAC), increasing the summer rating to 118MVA (each line). The cost estimate is $128.5 million[149] to be incurred in the next RCP.

694. The DPAR for the project was published in October 2024.

### Assessment

#### Morwell South does not have the capacity to supply more large-scale renewable generation (unconstrained)

695. We consider that there is sufficient rationale behind AusNet's consideration of network augmentation in the Mowell South supply area for reasons discussed above.

#### AusNet evaluated three network and two non-network options[150]

696. AusNet evaluated the following options through the Project Assessment Draft Report (PADR) – it selected Option 3, which has the highest capital cost and the highest NPV as shown in Table 4.10.

*Table 4.10: Comparison of options*

| Option | Description |
|---|---|
| 1 | Augment MWTS – LGA No.2 line with 19/3.25 conductor ($36.6 million capex, NPV $18.6 million, $2024) |
| 2 | Augment MWTS – LGA both lines with 19/4.75 conductor ($88.4million capex, NPV $34.6 million, $2024) |
| 3 | Augment MWTS – LGA both lines with 37/3.75 conductor ($106.1 million capex, NPV $73.2 million, $2024) |
| 4 | Connect a 60 MW / 240 MWh utility BESS to MWTS-LGA No. 3 66 kV line close to LGA ZS (5 years) ($4.2 million opex p.a., NPV -$16.2 million, $2024)[151] |
| 4a | Connecting a 60 MW / 240 MWh utility BESS (LGA BESS) to MWTS-LGA No. 3 66 kV line close to LGA ZS (5+5 years) ($4.2 million opex p.a., -$67.2 million, $2024) |
| 5 | Connect a 60 MW / 240 MWh utility BESS to LGA/WGI-LSSS2 66 kV line close to LGA ZS (5 years) ($4.2 million opex p.a., $32.5 million, $2024) |
| 5a | Connect a 60 MW / 240 MWh utility BESS to LGA/WGI-LSSS2 66 kV line close to LGA ZS (5+ 5 years) ($4.2 million opex p.a., $5.7 million, $2024). |

*Source: CE MWTS South_DPAR, Table 1, pages 11-12; ISP Step Change Scenario*

697. The three network augmentation options remove the MWTS-LGA constraint, with varying increases in capacity. The preferred Option 3 provides the highest combined line rating of 236MVA (Option 1 provides 128MVA and Option 2, 210MVA).

149 This is significantly higher than the nominated capex for AusNet's preferred Option 3 in the DPAR at $106.1 million ($2024) even allowing for escalation

150 AusNet also identified a fifth and sixth option – the fifth is similar to Option 4, but as it had a materially higher cost, it was not progressed; the sixth option was to deploy dynamic line rating, but this was deemed to be insufficient to address the identified need; we consider AusNet's position to be reasonable

151 Options 4 and 5 were proposed in response to the OSR; Options 4a and 5a were added by AusNet

698. The non-network solutions are not cost-effective. The augmentation will enable 'optimal generation' connection of 220MW of the 860MW aggregate connection enquiries, according to AusNet's modelling.

#### The difference between the NPVs of Options 1, 2 and 3 is relatively large and are sensitive to generation connection quantity

699. We discuss the key modelling assumptions in section 4.5.2 and which underpin market impact, emissions reduction, and reliability improvement benefits.

700. The NPVs vary significantly between the ISP Progressive Change Scenario and the Step Change Scenario for all but the preferred Option 3, indicating that it is likely to be the preferred option with varying demand and other assumptions characteristic of the two ISP scenarios.

701. Nonetheless, we note that AusNet provides two methods for undertaking sensitivity analyses for the ISP Step Change Scenario, Option 3:

1. Method 1 shows that:
    a. 10% reduction from the assumed Generation connected base case reduces the NPV from about +$50 million to about -$5 million, and
    b. 10% *increase* from the assumed Generation connected base case *reduces* the project NPV to about -$20 million.
2. Method 2 shows that:
    a. 10% reduction from the assumed Generation connected base case reduces the NPV from about $80 million to about $30 million, a reduction of about 60%, and
    b. 10% increase from the assumed Generation connected base case reduces the project NPV to about $40 million.

702. The differences between the two methods are not explained by AusNet.

703. This analysis indicates that the viability of the project is strongly dependent on:

- How much of the prospective generation actually connects to the Morwell South 66kV network, and
- The assumed benefits from FY37 to FY72.

**Findings**

704. We consider that the proposed expenditure is not sufficiently justified.

705. AusNet has selected an option to replace the conductors of both MWTS-LGA 66kV lines with a higher rated conductor that is expected to maximise the present value of the net economic benefit should the optimal generation connect, which is in accordance with the RIT-D process.

706. However, the selected option is very sensitive to the amount of generation that ultimately connects and to the market benefits that accrue beyond the first 10 years of the project. As discussed as discussed in section 4.7.3, there is considerable uncertainty about the quantum of these benefits.

## 4.6 Assessment of Demand Driven augex

### 4.6.1 What AusNet has proposed

707. As shown in Table 4.11, AusNet has proposed nine demand-driven network augmentation projects that are within our scope. We assess the proposed expenditure of each project in the following sub-sections with the exception of LV augex (Electrification & Flexible Services) which we assess in section 5.4.

*Table 4.11: AusNet proposed demand driven augex - $m, real FY2026*

| Demand Driven Augex | 2026-27 | 2027-28 | 2028-29 | 2029-30 | 2030-31 | Total |
|---|---|---|---|---|---|---|
| Augment East Gippsland 66kV Loop | 0.0 | 0.0 | 15.2 | 15.4 | 0.0 | **30.6** |
| Augment Eastern Cranbourne 66kV Loop | 1.4 | 12.9 | 24.5 | 0.0 | 0.0 | **38.8** |
| Install a new 22kV distribution feeder (WOTS21) | 0.0 | 0.0 | 0.0 | 2.2 | 5.1 | **7.3** |
| Install a new 22kV distribution feeder (SMR11) | 0.0 | 0.0 | 0.0 | 4.3 | 10.1 | 14.3 |
| Install a new 22kV distribution feeder (WGL31) | 0.0 | 0.0 | 0.0 | 5.7 | 13.4 | **19.1** |
| New Pakenham South ZSS | 1.7 | 18.7 | 36.1 | 0.0 | 0.0 | **56.5** |
| New Wollert ZSS | 28.3 | 17.9 | 0.0 | 0.0 | 0.0 | **46.2** |
| WGI new Tx | 0.0 | 0.0 | 4.1 | 4.2 | 4.2 | **12.6** |
| LV Augex (Electrification & Flexible Services) | 21.5 | 23.5 | 22.2 | 29.0 | 42.3 | **138.5** |
| **Total** | **52.9** | **73.1** | **102.1** | **60.7** | **75.1** | **363.9** |

*Source: EMCa table, derived from AusNet SCS capex model*

## 4.6.2 East Gippsland 66kV Loop

### What AusNet has proposed

708. AusNet has proposed augex of $30.6 million in the next RCP to implement is proposed East Gippsland 66kV loop reinforcement project.

709. AusNet has identified that, among other things, '*coincidental loading at six zone substations [in the East Gippsland 66kV loop] is forecast to reach 160MVA over the 2024/25 summer period under POE10 conditions, which exceeds the loop N capacity of 147MVA and is expected to exceed capacity under POE50 conditions by 2027.*'[152]

710. AusNet considers three network augmentation options and a non-network solution in its business case, selecting Option 1, reconductoring of the entire Traralgon – Maffra 66kV line as the preferred option at a capital cost of $30.6 million to be completed in FY2030.

711. There are two related projects:

- AusNet is currently implementing a project to increase the capacity of the MWTS-TGN 66kV lines – refer to our assessment in section 4.5.4, and
- AusNet proposes increasing the capacity of the MWTS-SLE and SLE-MFA 66kV lines – refer to our assessment in section 4.5.5.

### Assessment

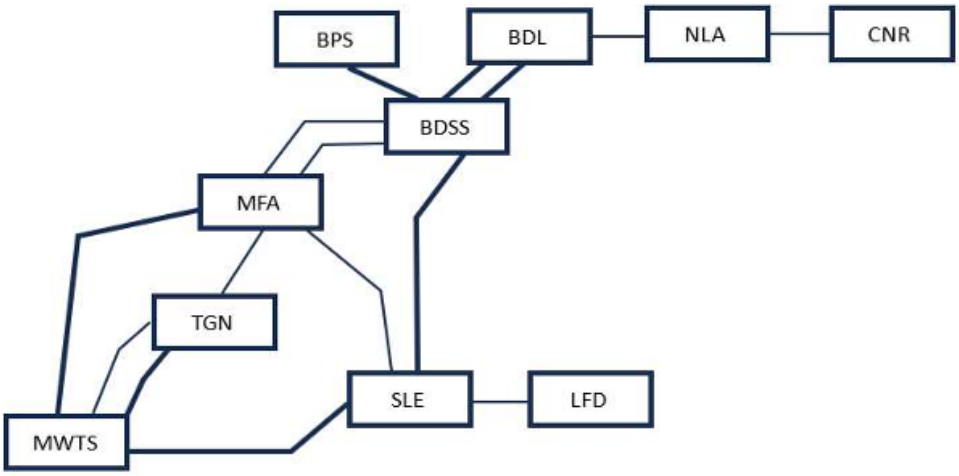
#### The Gippsland 66kV loop has several low-capacity long lines making it susceptible to voltage regulation challenges and it is isolated, restricting load transfer capacity

712. Figure 4.5 shows the high and low-capacity lines in the Gippsland loop. The worst-case N-1 condition is loss of the MWTS-SLE line. Characteristics that affect voltage management and thermal capacity are the long line lengths and the isolation from other 66kV networks.[153]

[152] ASD - AusNet - East Gippsland 66kV loop augmentation BC - 31012025 – PUBLIC, page 2

[153] Load transfers only available in the west portion of the loop at Traralgon (TGN)

*Figure 4.5: High capacity (bold) and low-capacity lines in the Gippsland 66kV loop*




*Source: ASD - AusNet - East Gippsland 66kV loop augmentation BC - 31012025 – PUBLIC, Figure 3*

### AusNet presents a compelling case for intervention within the next RCP if demand growth forecasts are realised

713. AusNet forecasts increasing peak demand over the next RCP driven primarily by customer growth, electrification of homes, and electric vehicle (EV) uptake within the region. In addition to the forecast peak demand of 160MVA exceeding the loop's N capacity:

- Coincidental 50PoE demand is expected to exceed N capacity by 2027
- The loop's N voltage collapse limit of 180MVA is expected to be surpassed by the summer 2031/2032 10PoE demand.
- The loop's N-1 capacity of 86.5MVA has been exceeded since at least 2018 under 50PoE conditions (i.e. with the major MWTS-SLE section being out of service).
- Network support from Bairnsdale Power Station (BPS) is no longer available (since 2022)[154] – we asked AusNet to confirm that all reasonable efforts had been made to secure a new, economically viable network support contract. From AusNet's response, we are satisfied that a commercially viable contract is not currently available.[155]

714. The thermal capacity limits require load shedding of up to 50% of total demand on four zone substations under certain worst-case conditions.

715. In our view there is a compelling case for AusNet to investigate means of alleviating the constraints.

### AusNet's range of options is reasonable

716. In addition to the network support contract with BPS and the 'do nothing' option, AusNet identified four options:

1. Reconductor the entire TGN-MFA 66kV line ($26.5 million, $2024)
2. Construct a new TGN-SLE 66kV line ($50.7 million capex, $2024)
3. Establish a TGN-SLE/MFA 66kV line ($61.8 million capex, $2024)
4. Construct a 30MW/150MWh battery energy storage system ($180 million capex, $2024).

717. AusNet selected Option 1, which in addition to having the lowest capex, has the highest estimated NPV at $142.6 million over a 30-year study period. The optimal timing is 2029.

154 ASD - AusNet - East Gippsland 66kV loop augmentation BC - 31012025 – PUBLIC, page 6

155 AusNet response to IR009 Q27

718. Provided the cost estimate is reasonable and the EUE derivation for each option is robust, Option 1 is likely to be the prudent and efficient choice, with the project to be completed within the next RCP.

#### Applying the 100% 50PoE demand forecast (summer and winter) leads to a 3-year deferral of the optimum timing (to 2032)

719. As a sensitivity study on demand, we used AusNet's EUE model to vary the maximum demand weightings to 100% 50PoE, which results in a three-year deferral of the optimum timing, to 2032.

#### Findings

720. We consider that the proposed East Gippsland 66kV loop reinforcement project is reasonable and with the demand forecast the optimal timing is to complete the project in FY29.

721. The project timing is susceptible to relatively small changes in demand. If the demand growth follows the 50PoE forecast, the optimal timing for the project would be delayed by three years.

### 4.6.3 Eastern Cranbourne 66kV Loop

#### What AusNet has proposed

722. AusNet has proposed augex of $38.8 million in the next RCP to implement is proposed Eastern Cranborne 66kV loop reinforcement project.

723. The Eastern Cranbourne 66kV network loop supplies more than 102,000 customers and AusNet has identified there is significant risk of unserved energy driven by the establishment of a new South-East Growth Corridor.

724. AusNet considers four network augmentation options and a non-network solution, selecting Option 1, installation of a new Cranbourne Terminal Station (CBTS) to Officer substation (OFR) 66kV line CBTS-OFR, as the preferred option at a capital cost of $38.8 million to be completed in FY2029.

#### Assessment

#### AusNet presents a compelling case for intervention within the next decade if demand growth forecasts are realised

725. AusNet states that: [156]

- Capacity constraints are primarily thermal capacity driven, with the loss of CBTS-LYD[157] 66kV line the worst-case outage, leading to overload of the CBTS-BWN[158] 66kV line (refer to Figure 4.6, which shows the proposed new Pakenham South zone substation, which we assess in section 4.6.5)
- The Eastern Cranbourne 66kV loop has an N capacity of 322MVA (including transfer capacity), N-1 capacity of 255MVA, and transfer capacity and demand management of 46.3 MVA[159]
- The N-1capacity was first exceeded under coincident 50PoE conditions in 2023; coincident maximum demand is expected to increase to 363 MVA in 2028

156 ASD - AusNet - Eastern Cranbourne 66kV loop augmentation BC - 31012025 – PUBLIC, page 2

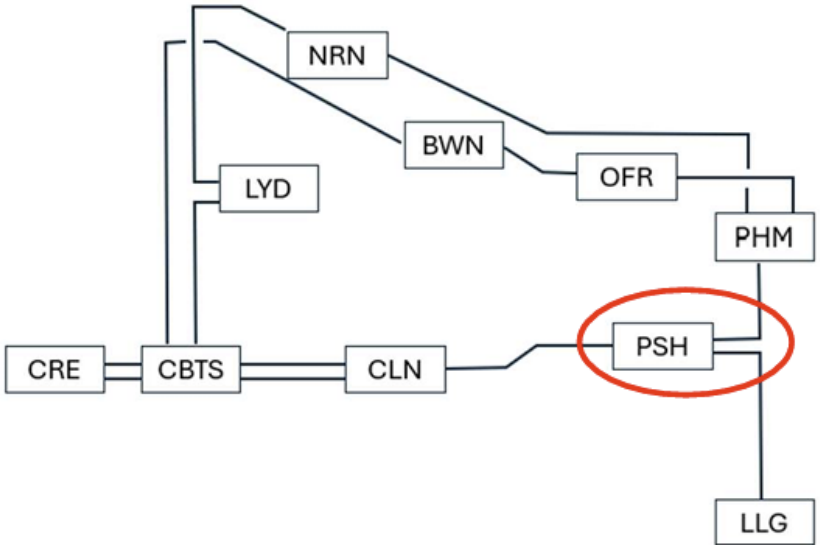
157 Lysterfield zone substation

158 Berwick North zone substation

159 Transfer capacity and demand management capacity is 46.3 MVA, however, AusNet advises that the majority of the transferable load can only be transferred from Clyde North (CLN) and so does not provide sufficient benefits to the northern section of the loop (LYD, BWN, NRN or OFR)

- The N capacity was forecast to be exceeded by the 10PoE demand in the summer of 2025 and by 2031 under summer 50PoE demand forecast, and
- All but the NRN-PHM and PHM-LLG 66kV lines will be overloaded under N-1 events. [160]

*Figure 4.6: Eastern Cranbourne 66kV network including proposed PSH zone substation*




*Source: ASD - AusNet - Eastern Cranbourne 66kV loop augmentation BC - 31012025 – PUBLIC, Figure 2 (extract)*

### AusNet's range of options considered is reasonable

726. In addition to the 'do nothing' option, AusNet identified four network augmentation options and a non-network option:

1. Install a new CBTS-OFR 66kV line ($33.8 million, $2024)
2. Install a new CBTS-PHM 66kV line ($40.2 million capex, $2024)[161]
3. Install new CBTS-PSH and PSH-PHM 66kV lines ($44.3 million capex, $2024)
4. Install a new CBTS-LLG 66kV line ($50.3 million capex, $2024), and
5. Construct a 25MW/100MWh battery energy storage system ($150 million capex, $2024).

727. AusNet also considered demand management and reconductoring the CBTS-BWN options but deemed them to be non-credible. Based on the justification provided in the business case, we consider the conclusions to be reasonable.

728. AusNet selected Option 1, which in addition to having the lowest capex, has the highest estimated NPV at $239.0 million over a 30-year study period. The optimal timing is nominated by AusNet as 2028 in the business case in some places and 2029 in others.[162]

### The proposed PSH zone substation defers the optimum timing for Option 1 to 2031

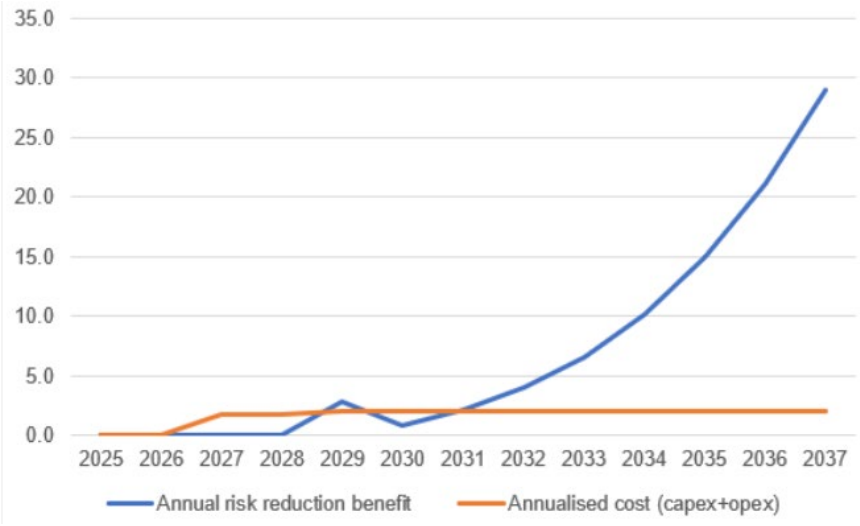
729. Whilst AusNet identifies the optimum timing for its proposed new CBTS-OFR 66kV line as 2029, its CBA model shows that the advent of the separately proposed PSH zone substation delays the optimum timing until 2031, as shown in Figure 4.7. Therefore, subject to PSH substation proceeding as planned, the new CBTS-OFR line could be deferred to 2031 or possibly beyond depending on actual demand growth.

160 Narre Warren; Pakenham; Lang Lang zone substations

161 PSH is Packenham Soth zone substation

162 For example, in section 4.3 (Preferred option), 2029 is quoted but in Tables 14-18 (sensitivity analyses), 2028 is nominated as the base case optimal timing

*Figure 4.7: Optimum timing – Eastern Cranbourne 66kV loop augmentation ($m2024)*




*Source: ASD - AusNet - Eastern Cranbourne 66kV loop augmentation economic model - 31012025 - PUBLIC*

#### Applying the 100% 50PoE demand forecast (summer and winter) is likely to lead to a two-to-three-year deferral of the optimum timing (to 2033 or 2034)

730. AusNet's own sensitivity analysis includes a low case of 98% demand (i.e. of the base case, which assumes 70% 50PoE and 30% 10PoE summer peak demand weighting), which results in the optimum timing being delayed to 2031.

731. We requested AusNet's EUE model for several demand-driven projects, however the Eastern Cranbourne 66kV loop EUE model was not provided. Based on the results from varying the similar East Gippsland 66kV loop model, we expect that varying the maximum demand weightings to 100% 50PoE, would similarly lead to a two-to-three-year deferral of the optimum timing, that is to 2033 or 2034.

#### Findings

732. We consider that the proposed Eastern Cranbourne 66kV loop reinforcement project is prudent. However, we found evidence of the inclusion of a risk allowance, which for the reasons we have discussed earlier in our report is not reflective of an efficient cost.

733. If the proposed Packenham South project is commissioned in the next RCP as planned, the proposed line upgrade can be deferred until 2031 with the current weighted demand forecast.

734. We note that the project timing is susceptible to changes in demand. If the demand growth follows the 50PoE forecast, the project may be able to be delayed by two to three years – that is, well into the next RCP.

### 4.6.4 Install a new 22kV distribution feeder (WGL31)

#### What AusNet has proposed[163]

735. Combined growth in demand from existing (brownfield) and newly developed (greenfield) sites in the Shire of Baw Baw, has led AusNet to identify looming constraints on the 22kV network, resulting in:

- An increasing risk of involuntary load shedding on 22kV feeders supplied by Warragul zone substation (WGL) beyond 2029, and
- Lack of capacity to connecting new customers to AusNet Services' network in the area supplied by WGL.

[163] ASD - AusNet - New 22kV distribution feeder (WGL31) BC - 31012025 – PUBLIC, pages 1- 12

736. AusNet's proposed solution is to construct a new 22kV feeder utilising the existing WGL24 feeder route at a cost of $16.3 million ($2024).[164] The new feeder will offload the existing WGL13 feeder and provide additional support to feeders WGL12, WGL21, and WGL24, which AusNet states are also close to be constrained.

### Assessment

#### AusNet presents a reasonable case for intervention within the next decade if demand growth forecasts are realised

737. There are nine 22kV feeders from WGL and data provided by AusNet suggests that the most heavily loaded feeders over the next RCP are likely to be WGL12 and WGL13. AusNet's business case presents the demand forecast versus capacity as shown in Figure 4.8 for WGL13. AusNet uses 'design' summer ratings:

- For WGL13:
  - 50PoE demand will exceed capacity of 12.4MVA in 2025
  - 10PoE demand already exceeds capacity
- For WGL12 (not shown)
  - 50PoE demand will exceed the capacity of 13.9MVA in 2028, and
  - 10PoE demand will exceed capacity in 2027.

738. None of the other feeders are expected to be overloaded prior to 2038.[165]

739. The forecast demand on WGL12 grows at a faster rate than for WGL13,[166] but nonetheless both feeders are forecast to be considerably overloaded by the end of the next RCP. There is therefore a prima facie case for some form of intervention within the next decade.

*Figure 4.8: WGL13 22 kV feeder load at risk (with no intervention)*


*Source: ASD - AusNet - New 22kV distribution feeder (WGL31) BC - 31012025 – PUBLIC, Figure 5*

#### AusNet undertook probabilistic cost-benefit analysis of four options

740. AusNet considers two network augmentation options and two non-network solutions in addition to the 'do nothing' (counterfactual) option:[167]

1. Construct a new 22kV feeder by utilising the existing WGL11 route ($21.5 million capex, $2024)

164 ASD - AusNet - New 22kV distribution feeder (WGL31) BC - 31012025 – PUBLIC, page 16

165 ASD - AusNet - New 22kV distribution feeder (WGL31) BC - 31012025 – PUBLIC, Tables 2, 5, 6

166 Perhaps reflecting the withdrawal of the temporary BESS support

167 AusNet advises it also considered three other network options that were deemed non-credible

2. Construct a new 22kV feeder by utilising the existing WGL24 route ($16.3 million capex, $2024)
3. Construct 5MW/10MWh Battery Energy Storage System (BESS) ($22.0m capex, $2024)
4. Contract external network support services to defer network investment (PV cost $118.0 million, $2024).

741. AusNet selected Option 2, the least cost option with the highest NPV ($280.6 million, $2024) of those considered. The economic timing determined from AusNet's cost-benefit analysis is 2029. Option 2 stands out as the best choice of the four options assessed by AusNet in detail.

742. The estimated capital cost of $16.3 million ($2024) makes provision for a new 22kV bus, exit cable, and new 22kV switch room in addition to the new feeder backbone (5.5km), voltage regulator and a new switch on the feeder. The work at the substation is required because there are no spare 22kV bays at WGL.

### AusNet rejects other network and non-network options

743. AusNet identifies that a low-cost alternative is available but that consolidating two feeders to release a feeder bay is uneconomical. We consider that this option is rejected without sufficient justification – for example, it may be able to economically defer the feeder upgrade cost of $12.2 million ($2024).[168]

744. We also expected to see explicit consideration in the business case of other typical network augmentation alternatives, either as part of a staged approach to building capacity to match load growth (i.e. when there is sufficient uncertainty) or as solutions, including:

- Uprating the WGL11 and/or WGL12 feeder exit cables – which could be cost-effective if significant demand is drawn from points near to the start of the feeder
- Installing ties between contiguous feeders to improve transfer capacity, and
- Feeder reconfiguration to provide increased permanent or temporary transfer capacity – this option is typically not feasible when all the feeders are isolated from each other, however that does not appear to be the case here[169] -
- for example, WGL23 has the lowest current and forecast demand and whilst it is separated from WGL12 by the WGL11, WGL13, and WGL31 feeder supply areas, it is not clear why open points could not be changed to transfer demand onto WG23.

745. AusNet's business case includes qualitative assessment of five non-network solutions and considers that two of these, Commercial Direct Load Control (DLC) and Behavioural Demand Response (BDR) may be able to defer investment in network augmentation by one-to-two years.[170] Given that currently 54% of customers are in the industrial and commercial segments, we concur that there are likely to be opportunities for demand management to cost-effectively defer the $16.3 million ($2024) capex proposed.

### We have several concerns with the modelling which are likely to lead to a modest reduction in EUE and therefore the assumed benefits

746. Firstly, transfer capacity is mentioned in the business case:

> *'The 22kV feeders interconnect with feeders from zone substations in Pakenham, Moe, and Leongatha. These interconnections do not allow for a sufficient load transfer from WGL to the other stations. The load transfer limit exists due to the distances from WGL*

168 ASD - AusNet - New 22kV distribution feeder (WGL31) BC - 31012025 – PUBLIC, page 8; no cost is provided

169 Refer to Figure 7 in the business case

170 ASD - AusNet - New 22kV distribution feeder (WGL31) BC - 31012025 – PUBLIC, Table 16

*to the other stations, the loadings of the interconnected feeders, and an insufficient number of ties.'*[171]

747. We assume the above reference is to the limitations of permanent load transfer as a solution. However, a note in the EUE model[172] indicates there is distribution transfer capacity (DTC) between some feeders which could be used following an N-1 contingency to reduce the amount of unserved energy.[173] However, it has not been taken into account in the modelling. The indicative amounts of DTC are relatively small and would likely diminish over the course of the next RCP. This infers that the reduction of the EUE would be relatively small by the end of the next RCP, however for completeness it should have been modelled.

748. A second matter is that AusNet has assumed unity power factor (pf) in converting its load duration curve (LDC) values from MVA to MW. This is likely to be a conservative assumption. A pf of a more typical 0.9 would have the effect of reducing the EUE (MWh) and therefore the EUE and the benefits from avoided EUE.

749. We also note that whilst reference is made to a battery energy storage system (BESS) installed in 2023 to offload WGL12 for three summers, no further information is provided in the business case, nor does the BESS appear in the CBA and other models. We assume that this contract will end as planned in 2026 and AusNet is proposing a long-term solution to the high loading on the majority of the WGL feeders (and which is forecast to increase). If this is the case, it is a reasonable position for modelling purposes.

#### The optimal timing is sensitive to the assumed demand forecast

750. AusNet's EUE analysis and therefore the optimal timing derivation is based on an assumed 70% 50PoE + 30% 10PoE demand forecast. This leads to the optimal timing of 2030. We requested AusNet's EUE model for the project, which includes a sensitivity study for a number of factors, including demand. The 'low case' demand is 90% of the base case demand and results in a 2-year deferral of the optimal timing (i.e. to 2032).[174]

751. Considering the potential reduction in EUE from the two modelling matters we identify above (i.e. assuming unity power factor and zero temporary DTC), it may be the case that a one-year deferment of the optimal timing under the base Case may result. This still leaves the project completion in the next RCP.

#### Findings

752. We consider that the proposed augex for establishing the new WGL31 feeder in the next RCP is not sufficiently justified.

753. There is a reasonable case for augmenting the supply capacity of WGL feeders sometime over the next decade. However, we consider that AusNet has not provided sufficient evidence to conclude that at least one of the network and/or non-network alternatives to its preferred Option 2 may provide a cost-effective means of managing demand uncertainty.

### 4.6.5 Install a new 22kV distribution feeder (SMR11)

#### What AusNet has proposed

754. AusNet proposes increasing the capacity of the 22kV network to supply the forecast demand in the Nagambie area to manage (i) the increasing risk of involuntary load shedding on the 22kV feeder SMR24 supplied from Seymour zone substation (SMR) beyond 2030, and (ii) constraints on connecting new customers in the area supplied by SMR24.

171 ASD - AusNet - New 22kV distribution feeder (WGL31) BC - 31012025 – PUBLIC, page 6

172 WGL13 - E@R Model- CONF, Demand – Low Case row 9

173 Undertaking load transfers requires switching in the distribution network which can take at least 30 minutes to enact, unless there are remotely controllable open point switches

174 AusNet's provided CBA model indicates the optimal timing is 2029, but its business case shows 2030 as the optimal timing (per Table 20 and Figure 15, ASD - AusNet - New 22kV distribution feeder (WGL31) BC - 31012025 - PUBLIC

755. AusNet proposes construction of a new 22kV feeder to offload SMR24 (Option 2) at a cost of $12.2 million ($2024) to be commissioned in 2030.

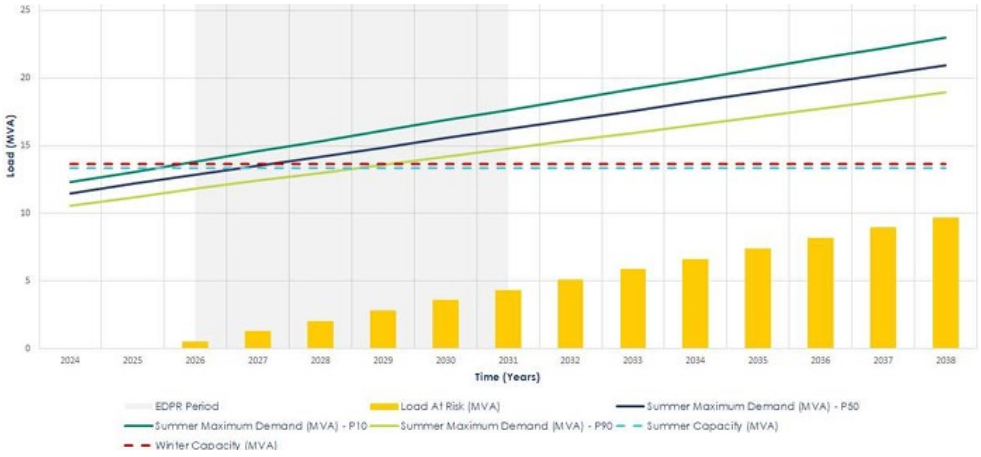
### Assessment

#### AusNet presents a reasonable case for intervention within the next decade if demand growth forecasts are realised

756. Unlike the business case and supporting analysis for the new WGL31 feeder discussed in above, the SMR11 business case explicitly identifies and includes available DTC in its determination of the demand forecast.[175] Figure 4.9 shows (i) the peak demand forecasts against various feeder ratings, and (ii) that the 50PoE forecast exceeds the feeder capacity in 2027 or 2028, noting that the load at risk shown in the figure is based on the margin between the 10PoE forecast and the summer capacity rating.

757. Given the forecast, there is a case for considering an intervention to provide more supply capacity from SMR within the next decade.

*Figure 4.9: SMR24 22 kV feeder- peak demand vs capacity (MVA)*




*Source: ASD - AusNet - New 22kV distribution feeder (SMR11) BC - 31012025 – CONF, Figure 3*

#### AusNet undertook probabilistic cost-benefit analysis of four options

758. In addition to the 'do nothing' (counterfactual) option, the following options were assessed by AusNet to identify the preferred solution:[176]

1. Manage SMR24 capacity with mobile generators - the mobile generators are assumed to be able to produce 2MW ($14.7 million opex, $2024)
2. Construct a new 22kV feeder (SMR11) to offload SMR24 – utilises existing infrastructure, such as shared easements and poles, to reduce the total cost ($12.2 million capex, $2024)
3. Construct a 2.5MW/5MWh Battery Energy Storage System ($8.8 million capex, $2024), and
4. Contract external network support services – procurement of network support to defer network investment ($55.2 million PV cost, $2024)

759. AusNet selected Option 2, the least cost option with, marginally, the highest NPV ($128.4 million, $2024) of those considered.[177] The economic timing determined from AusNet's cost-benefit analysis is 2029, although it proposes completing the two-year augmentation project

175 ASD - AusNet - New 22kV distribution feeder (SMR11) BC - 31012025 – CONF, Tables 3 and 4

176 ASD - AusNet - New 22kV distribution feeder (SMR11) BC - 31012025 – CONF, page 8-17

177 Option 1 and Option 3 NPV as determined by AusNet are $123.3 and $126.8m respectively ($2024); Option 4 NPV is $27.6m

in 2030. Option 2 stands out as the best choice of the four options assessed by AusNet in detail.

### AusNet identified three other network augmentation options which it considered unlikely to be cost effective

760. Unlike the WGL business case, in the SMR reinforcement business case AusNet discusses the 'do nothing' option further and three more network augmentation options:[178]

- No augmentation, instead 'risk manage' the feeder beyond 2026 – AusNet does not provide details of what risk management it would apply but says '*it is not possible to risk manage SMR24 as the 10%POE forecast exceeds 110% of the feeder rating*'. From this we infer that it means that reactively accepting the increasing likelihood of increasing periods of demand above the continuous rating of the feeder over the next RCP is not prudent; we consider this to be a reasonable position
- Feeder reconfiguration – AusNet states that SMR24 is a radial feeder with limited transfer capability
- Building additional feeder ties – rejected by AusNet because contiguous feeders '*such as BNR11 are also experiencing constraints'*; which in our view AusNet has not provided sufficient evidence to support this claim, but if it is actually the case, then the conclusion is reasonable, and
- Upgrade the feeder exit cable – AusNet rejects this because it would 'necessitate backbone capacity augmentations, which is considered uneconomical and would not deliver equivalent reliability benefits as the preferred option'; as discussed above, without evidence to the contrary, we consider that such an option may be viable as a staged approach to a longer-term solution such as Option 2 proposed by AusNet.

### AusNet also identifies five other non-network solutions and which may be able to economically support deferment of the proposed augmentation project

761. AusNet's business case includes qualitative assessment of five other non-network solutions and considers that two of these, Commercial Direct Load Control (DLC) and Behavioural Demand Response (BDR) may be able to defer investment in network augmentation by one-to-two years.

762. Given that currently 49% of customers are in the industrial and commercial segments, we also consider that there are likely to be opportunities for demand management to cost-effectively defer the capex proposed.

### EUE may be overstated due to a modelling assumption

763. Our understanding is that AusNet has assumed unity power factor (pf) in converting its load duration curve (LDC) values from MVA to MW. This is likely to be a conservative assumption. A pf of a more typical 0.9 would have the effect of reducing the EUE (MWh) and therefore the EUE and the benefits from avoided EUE.

### AusNet's 'low case' demand forecast leads to a four-year deferral of the preferred option

764. We requested AusNet's EUE model for the project and it includes a sensitivity study for a number of factors, including demand. The 'low case' demand is 90% of the base case demand. The 'low demand' case optimal timing is 2034 (i.e. a four-year deferral to AusNet's proposed 2030 commissioning year for Option 2),[179] noting that the NPV remains positive and higher than the other options.

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178 ASD - AusNet - New 22kV distribution feeder (SMR11) BC - 31012025 – CONF, page 8

179 SMR24 - E@R Model- CONF, Output for AusNet's NPV

### Findings

765. We consider that the proposed augex for establishing the new SMR11 feeder in the next RCP is not sufficiently justified.

766. There is a reasonable case for augmenting the supply capacity of feeder SMR12 (or off-loading it, as proposed) sometime over the next decade. However, we consider that AusNet has not provided sufficient evidence to conclude that at least one of the network or non-network alternatives (or a combination of solutions) to its preferred Option 2 may provide a cost-effective means of managing demand uncertainty.

767. Furthermore, if as we suspect AusNet's power factor assumption is conservative, correcting it to a lower value would reduce the EUE and therefore the benefit from the proposed feeder.

## 4.6.6 Install a new 22kV distribution feeder (WOTS21)

### What AusNet has proposed

768. AusNet proposes increasing the capacity of the 22kV network to supply the forecast demand in the city of Wodonga and surrounding areas which are predominantly services from Wodonga Terminal Station (WOTS). Specifically, development in the area supplied by WOTS25 feeder is expected to be capacity constrained from 2026.

769. AusNet proposes splitting WOTS25 into two feeders, creating a new WOTS21 22kV feeder at a cost of $6.3 million ($2024) to be commissioned in 2028.

### Assessment

#### AusNet presents a reasonable case for intervention within the next decade if demand growth forecasts are realised

770. The WOTS25 business case explicitly identifies and includes available distribution transfer capacity (DTC) in its determination of the demand forecast.[180] Figure 4.10 shows (i) the peak demand forecasts against various feeder ratings, with (ii) the 50PoE forecast exceeding the feeder capacity in 2027 or 2028, noting that the load at risk shown is the margin between the 10PoE forecast and the summer capacity rating.

771. Given the forecast, there appears to be a case for considering an intervention to provide more supply capacity from WOTS within the next decade.

*Figure 4.10: WOTS25 22kV Feeder demand vs capacity and load at risk (MVA)*


*Source: ASD - AusNet - New 22kV distribution feeder (WOTS21) BC - 31012025 – PUBLIC, Figure 4*

180 ASD - AusNet - New 22kV distribution feeder (SMR11) BC - 31012025 – CONF, Tables 3 and 4

772. AusNet undertook probabilistic cost-benefit analysis of four options. In addition to the 'do nothing' (counterfactual) option, the following options were assessed by AusNet to identify the preferred solution:

1. WOTS25 22kV feeder upgrade to a higher rating ($9.4 million capex, $2024)
2. Construct a new 22kV feeder (WOTS21) by splitting WOTS25 into two feeders ($6.3 million capex, $2024)
3. Construct 5 MW/10 MWh BESS ($22.0 million capex, $2024), and
4. Contract external network support services to defer network investment ($298.4 million PV cost, $2024).

773. AusNet selected Option 2, the least cost option with, marginally, the highest NPV ($740.6 million, $2024) of those considered. The economic timing determined from AusNet's cost-benefit analysis is 2028. Option 2 stands out as the best choice of the four options assessed by AusNet in detail.

774. The estimated capital cost of $6.3 million ($2024) includes 2km of new exit cable, replacing a pole, and two new switches.

### AusNet identified three other network augmentation options which it considered unlikely to be cost effective

775. Three of the four 'options considered but not progressed' are the same as enunciated in the SMR11 business case (risk management, feeder reconfiguration, and feeder ties) and the comments we made in section 4.6.5 apply. The fourth 'not progressed' option is to manage WOTS25 capacity with mobile generators, which AusNet dismisses because it '*does not provide connection opportunities for customers from areas without AusNet assets, such as the Leneva-Baranduda growth area.*'[181] Whilst this is not likely to be a cost-effective long-term solution to manage growth in the area, we consider that AusNet should have provided quantitative analysis to demonstrate that it is not a cost-effect short-term solution. However, given the relatively low cost the new exit cable (thanks to the spare bay), it is unlikely that mobile generators would provide a viable deferment option.

### EUE may be overstated due to a modelling assumption

776. Our understanding is that AusNet has assumed unity power factor (pf) in converting its LDC values from MVA to MW. This is likely to be a conservative assumption. A pf of a more typical 0.9 would have the effect of reducing the EUE (MWh) and therefore the EUE and the benefits from avoided EUE.

### AusNet's 'low case' demand forecast would lead to a two-year deferral of the preferred option

777. We requested AusNet's EUE model for the project and it includes a sensitivity study for a number of factors, including demand. The 'low case' demand is 90% of the base case demand. The 'low demand' case optimal timing is 2030 (i.e. a two-year deferral to AusNet's proposed 2028 commissioning year for Option 2).[182]

### Findings

778. We consider that the proposed augex for establishing the new WOTS21 feeder in the next RCP is reasonable.

779. There is a reasonable case for splitting WOTS25, creating new feeder WOTS21, sometime over the next decade. Given the relatively low cost of establishing WOTS21, it is likely to be the prudent investment within the next RCP.

181 ASD - AusNet - New 22kV distribution feeder (WOTS21) BC - 31012025 – PUBLIC, page 8

182 WOTS25 - E@R Model- CONF, Output for AusNet's NPV

## 4.6.7 New Packenham zone substation

### What AusNet has proposed

780. Based primarily on industrial development in the Officer and Packenham areas, AusNet expects maximum demand in 2031 to exceed the N rating of Clyde North zone substation (CLN) and the N-1 ratings of CLN, Officer zone substation (OFR), and Pakenham zone substation (PHM).

781. AusNet considers two network augmentation options in its business case, selecting Option 2, installation of a new Pakenham South zone substation (PSH), as the preferred option at a capital cost of $56.5 million to be completed in FY2028/29.

### Assessment

#### AusNet presents a reasonable case for intervention within the next decade if demand growth forecasts are realised

782. Peak 50PoE demand on CLN zone substation is forecast to exceed the N-1 capacity in 2026 and for approximately 30% of the year by 2031 (58% of the year based on 10PoE). The EUE for CLN at 1,204 MWh dwarfs the total EUE for the other two substations (3MWh and 0.34 MWh for OFR and PHM, respectively).

783. Furthermore, AusNet states that some 22kV feeders supplying the area are already thermally constrained.

784. It is therefore reasonable to assume that some form of intervention is required to offload CLN substation and the overloaded 22kV feeders within the next decade even if load growth is not as rapid as forecast.

#### AusNet considered two options in addition to 'do nothing'

785. In addition to the 'do nothing' option, AusNet identified two options:

- Install a second transformer at Lang Lang zone substation and construct a new 22kV feeders ($22.1 million, $2024), and
- Install a new Pakenham South zone substation ($49.2 million capex, $2024).

786. AusNet discounted the viability of demand side options '*[d]ue to the 'critical need to ensure a secure supply at Pakenham South growth area.'*[183] AusNet makes no mention of other non-network alternatives such as BESS as considered in other demand-driven business cases. However, based on the costs of BESS in the other AusNet business cases and the expected demand growth in the region, we consider it unlikely that a BESS would be cost-competitive.

787. AusNet selected Option 2 despite the higher capital cost because its NPV is over 20 times higher than the Option 1 NPV.

788. Option 1 involves adding a second 66/22kV 33MVA transformer, eliminating the EUE at LNG and reducing EUE in the study area. However, AusNet states that '*this option does not fully address the energy at risk at other zone substations identified in this business case over the long-term assessment period, nor does it provide a comprehensive solution for meeting new electricity demand growth.'*[184] Our assessment of its EUE modelling bears out this claim.

789. The scope of work for the preferred Option 2 includes 2 x 33MVA 66/22kV transformers, bus section, and 22kV feeder works. From the information provided it is to be located near the centre of the load growth and will reduce the EUE substantially, offloading CLN and reducing overloads on existing 22kV feeders.

183 ASD - AusNet - New ZSS Pakenham South BC - 31012025 – CONF, page 16

184 ASD - AusNet - New ZSS Pakenham South BC - 31012025 – CONF, page 18

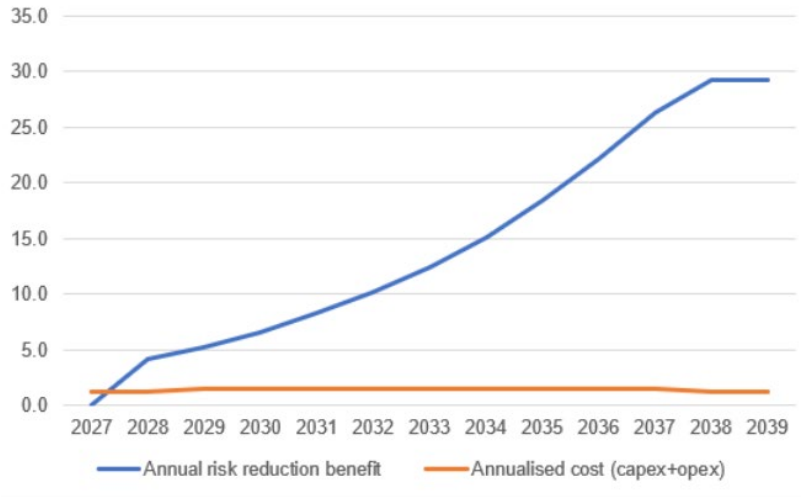
790. The NPV is very sensitive to the demand forecast, with AusNet's 'low case' (95% of the base case weighted demand forecast) showing a 50% reduction in NPV, however it is still strongly positive.[185]

### The optimal timing is likely to be in the next RCP

791. AusNet's cost-benefit model identifies the economic timing of the proposed PSH substation as FY2028, as shown in Figure 4.11. The extent of EUE growth due to the breach of N-1 and later N ratings at CLN lead to the optimal timing early in the next RCP.

792. Using an alternative 'low' demand forecast of 100% 50PoE, the monetised EUE is reduced from $8.9 million in 2029[186] to $3.4 million but given the annualised cost of the proposed work is $1.5 million, the optimal timing remains within the next RCP, all other things being equal.

*Figure 4.11: Optimum timing derivation – proposed new Pakenham South zone substation*




*Source: ASD - AusNet - New ZSS Pakenham South BC - 31012025 – CONF*

### Dependency of East Cranbourne 66kV loop timing on PSH

793. As noted in our assessment of the Eastern Cranbourne 66 kV loop augmentation proposal, establishment of PSH helps reduce the EUE in the region and enables deferral of the proposed new CBTS-OFR 66kV line. Given the sources of uncertainty regarding demand forecasts, building PSH seems a prudent next step to achieve manageable EUE risk in the region.

### Findings

794. With the assumed demand growth in the area, the optimal timing for building the proposed new Packenham South zone substation is within the next RCP and it is the prudent solution.

795. However, we found evidence of the inclusion of a risk allowance, which for the reasons we have discussed earlier in our report is not reflective of an efficient cost.

## 4.6.8 New Wollert Zone Substation

### What AusNet has proposed

796. AusNet advises that the 50PoE forecast demand will exceed the N capacity of the Kalkallo zone substation (KLO) that supplies load in the Wollert area by 2027.

185 ASD - AusNet - New ZSS Pakenham South BC - 31012025 – CONF, Table 12

186 2029 is the year in which monetised EUE first exceeds the annualised cost of the new substation

797. AusNet considers two network augmentation options and a non-network (BESS) option in its business case, selecting Option 1, installation of a new Wollert zone substation, as the preferred option at a capital cost of $46.2 million to be completed in FY2027/28.

### Assessment

#### AusNet presents a case for intervention within the next decade if demand growth forecasts are realised

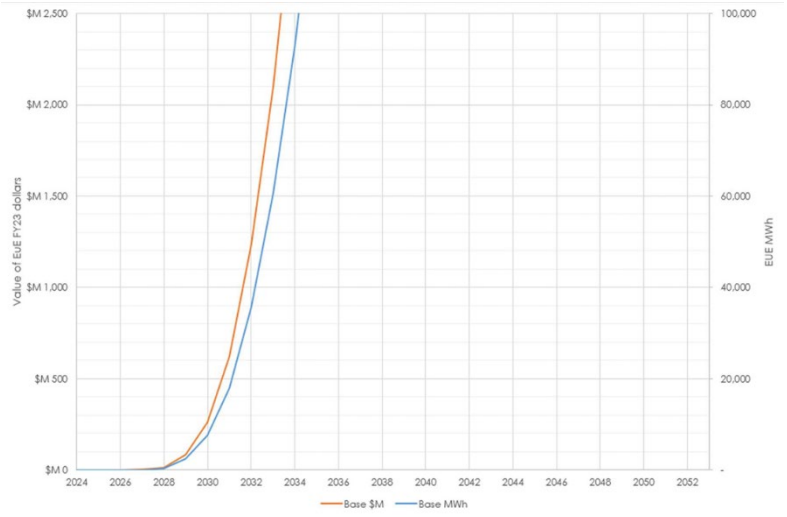
798. Forecast maximum demand is expected to exceed the ratings for the zone substations in the Wollert area, resulting in 18 GWh of EUE by 2031 if there is no intervention.[187]

799. KLO's demand is expected to exceed the N capacity for 20% or more of the year by 2031.[188] If this demand growth is realised, it generates a very high monetised EUE as shown in Figure 4.12. Even allowing for some emergency overload capacity, the EUE would be very high.

800. The peak demand on two of the three other zone substations in the Wollert area (Dorreen and Epping) has already exceeded the respective N-1 capacity limits, and peak demand on South Morang substation is forecast to exceed the N-1 ratings (but not the N rating). KLO therefore is the critical substation from an aggregate EUE risk-cost perspective.

801. In our view, this provides sufficient evidence to support some form of intervention within the next decade.

*Figure 4.12: Estimated value of EUE (primarily driven by expected overload of KLO)*




*Source: ASD - AusNet - WGI new Tx BC - 31012025 – PUBLIC, Figure 5*

#### AusNet considered three options in addition to 'do nothing'

802. In addition to the 'do nothing' option, AusNet identified three options:

1. Build new Wollert Zone substation - installing a new 2x33MVA 66/22kV zone substation ($40.4 million capex, $2024)
2. Install a third transformer at KLO - adding a third 33MVA 66/22kV transformer and third 22kV bus section ($47.0 million capex, $2024), and
3. Install a 1MW/4MWh BESS at KLO ($25.5 million, $2024).

803. Option 1 is AusNet's preferred solution, with the new Wollert substation to be located close to existing dual circuit 66 kV lines on the eastern edge of the Wollert precinct. This option

187 ASD - AusNet - New Wollert ZSS BC - 31012025 – CONF, page 8

188 ASD - AusNet - WGI new Tx BC - 31012025 – PUBLIC, LDC, Figure 4

relieves the loading at surrounding zone substations by eliminating the energy at risk at Kalkallo substation and providing capacity in Wollert to address future development.

804. Option 1 has the lower capital cost of the two network solutions and the highest NPV at $67.3 billion over the study period.

#### Sensitivity study indicates the project will be required in the next RCP

805. The NPV is sensitive to the demand forecast with AusNet's 'low case' (95% of the base case weighted demand forecast) showing a 30% reduction in NPV, however it is still strongly positive, due mainly to the amount of time demand is still expected to exceed the firm capacity of KLO.

806. AusNet's cost-benefit model identifies the economic timing of the proposed new Wollert zone substation as FY29 due to the extent of EUE growth from the breach of N-1 and later N ratings at KLO.

807. Using an alternative demand forecast of 100% 50PoE, the monetised EUE is reduced from $10.9 million in 2028 to $2.9 million. With the $3.3 million annualised cost of the proposed work, the optimal timing is deferred only one year and remains within the next RCP, all other things being equal.

#### Findings

808. With the assumed demand growth in the area, the optimal timing for building the proposed new Wollert zone substation is within the next RCP and it is the prudent solution.

809. However, we found evidence of the inclusion of a risk allowance, which for the reasons we have discussed earlier in our report is not reflective of an efficient cost.

### 4.6.9 WGI new transformer

#### What AusNet has proposed

810. Demand growth in the Wonthaggi and surrounding areas is expected to increase consistently over the next decade because of population growth and electrification of transport and households.

811. Wonthaggi zone substation (WGI) has three aged 1960s 10/13.5 MVA 66/22kV transformers, seven 22kV feeders, and outdoor switchgear.

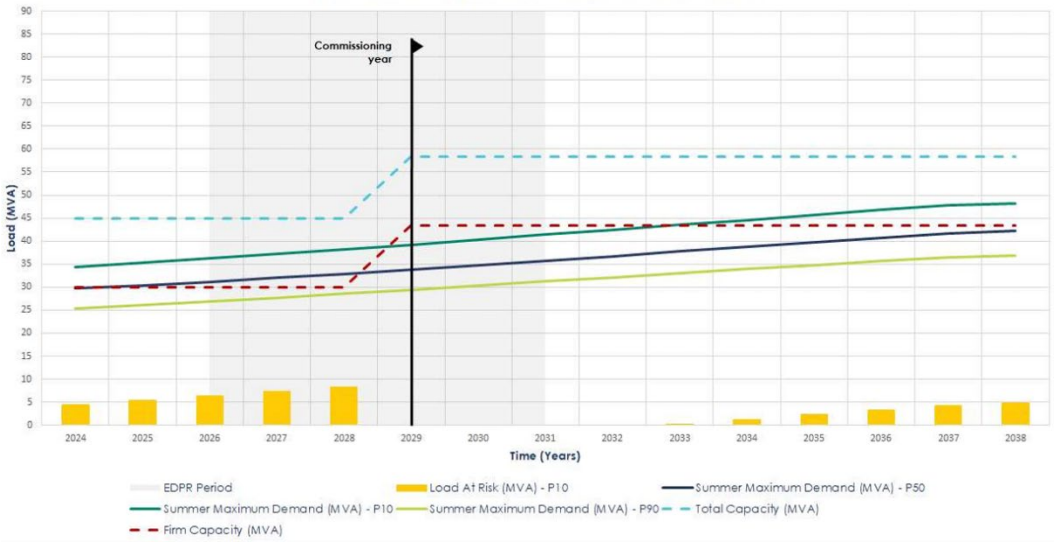
812. AusNet proposes installation of a new 20/33MVA 66/22kV transformer to replace one of the existing transformers at a cost of $12.6 million.

#### Assessment

#### AusNet presents a case for intervention within the next decade if demand growth forecasts are realised

813. As shown in Figure 4.13, AusNet forecasts a steady increase in peak demand, with current firm (N-1) capacity expected to be exceeded in 2025 (50PoE) and with the 10PoE forecast already 5MVA above the N-1 capacity. Without intervention, the N capacity would not be exceeded until 2040 if demand growth follows the 50PoE trajectory, however the N capacity would be exceeded by 2024 or 2035 if demand grows at the higher 10PoE rate.

*Figure 4.13: Demand forecast versus N-1 and N WGI capacity (showing commissioning year for AusNet's preferred option)*




*Source: ASD - AusNet - WGI new Tx BC - 31012025 - PUBLIC*

814. AusNet advises that '*several connection inquiries for connecting industrial/commercial loads have been already received, and applications to increase the capacity of the existing loads in the abovementioned areas have been made*.'[189]

815. The forecast demand growth would not appear by itself to present a compelling case for reinforcement within the next RCP because the N capacity is not exceeded and the N-1 capacity is not significantly exceeded until the later years of the next RCP.

816. However, to add to the driver for intervention, AusNet estimates that there is a relatively high probability of coincident outages of two of the three 60 plus year old 10/13.5 MVA transformers currently installed at WGI:

- The assumed transformer failure rate is 13.5% (1 in 7.4 years), which is much higher than the 'typical' 50-year life (2%)
- The assumed N-2 failure rate is 0.6% (1:167 years), which is much higher than a 'typical' transformer N-2 failure rate of 0.04% (1:2,500 years).

817. Combined with the assumed mean time to repair the transformers (which are reasonable in our view), the probability that a single transformer will be unavailable is 5.2% and the probability that two transformers are unavailable at the same time is 0.14%.[190]

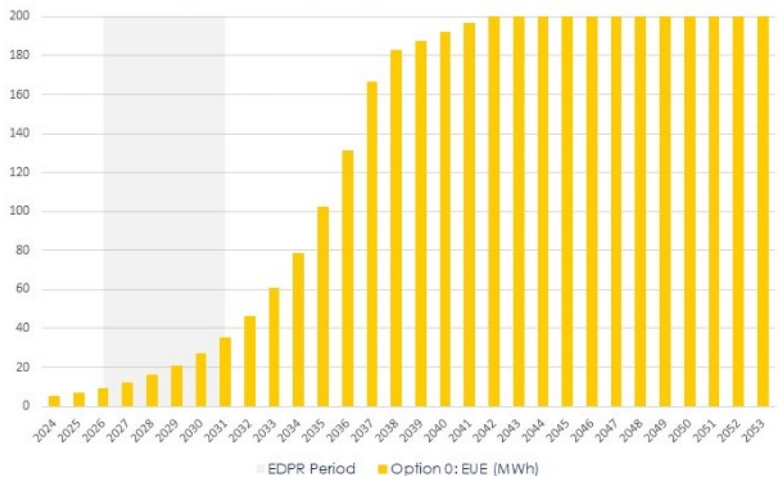
818. Because of the low remaining capacity of WGI with only one transformer (i.e. for an N-2 event) and the relatively high probability of occurrence, it is this failure mode rather than the N-1 failure mode that drives the majority of the EUE shown in Figure 4.14.[191]

189 ASD - AusNet - WGI new Tx BC - 31012025 – PUBLIC, page 2

190 WGI – E@R Model- CONF, Asset Unavailability – Base Cas

191 WGI – E@R Model- CONF, Summary – Base Case

*Figure 4.14: Estimated EUE – WGI do nothing counterfactual (MWh)*




*Source: ASD - AusNet - WGI new Tx BC - 31012025 – PUBLIC, Figure 5*

### AusNet considered four options in addition to 'do nothing'

819. In addition to the 'do nothing' option, AusNet identified three network augmentation options and one non-network solution:[192]

- Option 1 - Replace 3 x 10/13.5 MVA Tx with 3 x 20/33 MVA Tx ($10.8 million in the next RCP, total cost of $32.4 million, $2024)
- Option 1A - Replace 1 x 10/13.5 MVA Tx with 1 x 20/33 MVA Tx ($10.8 million, $2024)
- Option 2 - Construct 2x 20/33MVA zone substation in Inverloch ($0 in the next RCP, total cost $65.0 million, $2024), and
- Option 3 - Contract network support services to defer network investment ($0 capex, PV opex $21.2 million over 30-year study period).

820. Option 1A is AusNet's preferred solution, with the replacement transformer to be installed by FY2029 according to the business case, although we note from the expenditure profile that it will not be completed until FY31. The difference is not explained. This option relieves the overloading at WGI for five – six years, at which time a further intervention is likely to require consideration.

821. Whilst it does not provide a long-term solution, the relatively low cost, staged approach to alleviating the EUE risk at WGI is a prudent solution. Option 1A has the lowest cost and the highest NPV ($41.9 million) of the options considered.

### Sensitivity study

822. AusNet did not include a variation of demand in its sensitivity analysis. We applied a 100% weighting to the 50PoE demand forecast in AusNet's EUE model as a form of 'low case' study, which resulted in a EUE reduction of 35% over the study period. This will still result in a strongly positive NPV.

823. Using an alternative 'low' demand forecast of 100% 50PoE and retaining the $0.66 million annualised cost of the proposed work, the optimal timing is deferred by until 2031, all other things being equal. That is, the optimal timing is still likely to be within the next RCP.

### Findings

824. With the assumed demand growth in the area, the optimal timing for adding the proposed 20/33MVA 66/22kV transformer at WGI is within the next RCP, and it is the prudent solution.

825. However, we found evidence of the inclusion of a risk allowance, which for the reasons we have discussed earlier in our report is not reflective of an efficient cost.

192 ASD - AusNet - WGI new Tx BC - 31012025 – PUBLIC, Tables 7, 10, 12,

# 4.7 Findings and implications for proposed augex

## 4.7.1 Summary of findings

826. We consider that collectively the projects and programs that we have reviewed overstate the required capex for the next RCP.

### Context

827. AusNet has proposed an augex forecast of $959.9m. We have been asked by the AER to consider approximately 70% of the proposed augex and in the current section we have reviewed projects with a combined value of $504.7m, comprising

- Two safety-related programs
- A REFCL compliance program
- Four connection enablement projects
- Eight demand-driven augex projects

828. In section 5 we provide our assessment of three further augex projects that are for AusNet's CER and electrification program.

### Findings summary by driver

#### One of the two proposed safety programs is justified

829. We are satisfied that the proposed capex for Fall Arrest System is reasonable and reflects a prudent and efficient forecast of the proposed capex. However, we are not convinced by the analysis presented by AusNet of the benefits of the Early Fault Detection. We consider that the analysis does not justify the proposed capex or opex step change.

830. The absence of documentation that explains and supports the modelling approach and tests the sensitivities of the outcomes is a weakness of the proposal.

#### AusNet's proposed REFCL compliance program is justified

831. We consider that the proposal to address requirements at four sites as part of AusNet's proposed REFCL compliance program is reasonable.

832. We consider that the forecasting process applied by AusNet is reasonable, the solutions reflect a reasonable estimate of AusNet's requirements and AusNet has taken reasonable steps to defer the augmentation. However, we consider the application of the risk allowance and additional costs included in the cost estimate contributes to a higher than efficient cost.

#### One of AusNet's proposed four connection enablement projects is justified

833. AusNet has presented four projects on the assumption that the current pipeline of renewable energy generator connection enquiries will lead to actual projects if sufficient unconstrained access to parts of AusNet's 66kV network is provided. AusNet states that the benefit to consumers is lower overall generation costs and emissions from facilitating connection and displacing fossil-fuel generation/emissions.

834. Two of the four projects have passed the RIT-D/RIT-T process and are essentially underway with completion scheduled for 2027. These projects do have the highest likelihood of generating the expected benefits, but this will take many years.

835. Whilst AusNet has developed sophisticated modelling of market benefits drawing off AEMO's PLEXOS model, the results of its analysis are extremely sensitive to the generation capacity that actually connects in the areas to which AusNet proposes building network capacity. Further, we consider that AusNet has overstated the benefits of the projects, by assuming (a) that the generation capacity it has assumed will connect at the times that AusNet has assumed, (b) that renewable energy generators would not connect (even on a

constrained basis) unless AusNet undertakes the augmentation projects, and (c) that such generation will displace non-renewable generation for the next 45 years.

836. We consider that the MWTS Stage 1 project is reasonably justified. However, we do not consider that the expenditure for the other three projects is sufficiently justified and that the proposed projects are essentially speculative without further evidence of sufficient firm generator project status and more realistic assumptions to underpin the economic analysis.

#### Based on AusNet's demand forecast, the majority of proposed demand-driven projects and programs are justified

837. For the majority of the projects we reviewed we are satisfied that there is a reasonable need for AusNet to consider means of mitigating risk of unserved energy with increasing demand, that the selected solutions are prudent, and that the optimal timing is in the next RCP. However, the cost estimates were higher than an efficient level due primarily to the inclusion of risk allowances.

838. In two of the three proposed feeder augmentation projects that we reviewed, we consider that non-network solutions are likely to enable prudent deferment of the proposed new feeders.

### 4.7.2 Implications for proposed capex allowance

#### Alternative forecast methodology

839. Our proposed alternative forecast for the augex categories that we have reviewed in this section involves one or more of the following adjustments, to the extent that it formed the basis of AusNet's forecast and which we consider to be not justified or overstated:

- Adjustment to the volume of work
- Adjustment to the unit cost basis for the proposed forecast
- Adjustment for risk allowance and management reserve provisions
- Adjustment to the timing of the proposed expenditure, resulting in deferment beyond the end of the next RCP
- Adjustments to correct modelling issues and/or unsupported or incorrect model input assumptions, and/or
- Adjustment to align the forecast with historical spend, where an ongoing level of expenditure represents a reasonable default assumption and where the proposed increase was not otherwise justified.

#### Alternative forecast of expenditure

840. We consider that a reasonable alternative forecast for AusNet for the projects within the augex category that we reviewed within the current section, would be between 40% and 50% less than AusNet has proposed.

841. We stress that our advice on an alternative forecast relates only to the projects within the category of expenditure within the scope of our review and does not necessarily have any implication for augex that was not within the scope of our review.

# 5 REVIEW OF PROPOSED CER-RELATED EXPENDITURE

AusNet proposes expenditure totalling $266.7m over the next regulatory period, to address the impact of CER and electrification.

$214.1m of this is represented by four augex programs that are intended to provide for voltage compliance, CER enablement and reactive 'supply improvement', plus the largest single project which is a proposal costed at $138.5m to undertake proactive augmentation to address the impact on the network of increased customer electrification.[193] We have been asked to review $173.7 million of the proposed CER-related augex, which excludes the CER enablement project.

We consider that AusNet has significantly overstated the claimed benefits of its proposed LV program to respond to electrification and consequently we consider that it has not justified undertaking the proactive investment in network augmentation. We consider that AusNet has also not justified the level of steady state voltage compliance expenditure that it proposes. For the three augex projects that we reviewed, we consider that only around 5% of the amount that AusNet has proposed, and which corresponds to the majority of its proposed reactive supply improvement program, is justified.

AusNet also proposes ICT capex of $40.8 million to develop a 'DSO/Future Service Provider Hub' and proposes a 'full rollout' of flexible exports from 2027. Included in its proposal are opex step changes amounting to $11.8 million over the period.

We consider that its proposed capex for the CER-related ICT is significantly overstated, largely because of scope elements that AusNet has not justified. We consider a reasonable alternate estimate of CER-related ICT is between 30 to 40% lower than AusNet has proposed.

On the basis that some form of DSO is justified, we consider that AusNet's proposed ICT DSO opex step change of $3.2 million is a reasonable estimate of additional opex requirement for this purpose. However, we consider that AusNet has not justified an opex step change of $8.5 million that it proposes to enable it to make 'flexible service' load curtailment payments to customers.

## 5.1 Introduction

### 5.1.1 Scope

842. In this section we describe and assess AusNet's proposed expenditure for CER and LV electrification. The majority of this is augex, which is why we have included it in the current report. There is one element of AusNet's proposal that is for an ICT project (DSO hub) which we also assess in the current report since it is an integral part of AusNet's proposed

[193] While we list 'CER enablement expenditure of $40.4m in Table 5.2 for completeness, this is not in the scope of our review.

CER program, and which (for reconciliation purposes) we also refer to in our related ICT report.

843. We have been asked by AER to assess only some specific CER programs but, for completeness, we have listed and refer to the aggregate cost of AusNet's program including some projects that we have not been asked to review. In our assessment of projects within our scope, there are also some inter-relationships with these projects, which we refer to where relevant. However, for clarity, our assessment and findings in this report are restricted to the projects within our scope.

### 5.1.2 Structure of this section

844. In this section we first provide context by describing the information that AusNet provided for our review and summarising key elements of AusNet's CER and electrification strategy, its proposed projects and proposed expenditure.

845. Three of its proposed projects are augex projects and two of these are within our scope as follows:

- Voltage compliance and quality of supply, and
- LV augmentation augex (electrification and flexible services).

846. In our assessment sections, we assess each of these two programs, followed by our review of AusNet's proposed ICT project (DSO hub). In each of these, we assess proposed capex and any opex step changes that AusNet has proposed.

847. Finally, we summarise our findings and present the implications of those findings for AusNet's proposed CER-related expenditure.

## 5.2 What AusNet has proposed

### 5.2.1 AusNet's information on its CER-related expenditure

#### Information provided as part of AusNet's regulatory submission

848. In undertaking our review, it was first necessary to understand the information that AusNet had provided relevant to our scope. The nature of what AusNet was proposing and the inter-relationship between different elements of its proposal became evident over the course of our review and we consider it useful to describe our understanding of this information in the first instance.

849. In Figure 5.1 we provide an overview of the relevant information provided as part of AusNet's regulatory submission.

*Figure 5.1: AusNet regulatory submission documents relevant to assessing its proposed CER-related expenditure*

**EDPR Regulatory submission[a]**

CER-related information is introduced in section 6.8 of AusNet's regulatory submission. This is titled 'CER enablement' which is a specific capex project (see Table 5.2 below) but which does not encompass all of AusNet's CER-related expenditure. AusNet makes some reference in this section to voltage compliance, LV augex and its proposed ICT DSO project but states that information on these projects is provided in other sections of its submission (and which we identified to be the case).

Numerous references to electrification and its implications are included in the EDPR, with the main outline provided in section 6.6.

The EDPR submission refers to the following supporting documents:

- CER integration strategy
- CER enablement business case and economic model,[b]
- Demand-driven augex (LV electrification) business case, and
- Hosting capacity modelling detailed methodology.

**CER integration strategy**

Following background information on evolving customer needs this document provides a high-level overview of how AusNet seeks to identify and to plan least cost solutions. While the focus of this document is on export hosting capacity, it does refer to utilising the same modelling and approach to plan for LV network investments to support electrification.

**Hosting capacity modelling detailed methodology**

This document brings together a description of AusNet's modelling as a common approach that it has used to identify and quantify the scale of CER-related programs that it proposes. In addition to describing its hosting capacity and export constrain modelling, the document includes descriptions of its economic modelling for its proposed projects for:

- Voltage compliance
- Electrification, and
- CER enablement.

We refer to this document in our assessments of the first two of these programs (the last one not being within our scope).

**Relevant business case information**

AusNet provides business case documents relevant to our scope, together with basic 'option' NPV calculations, for:

- Voltage compliance, and
- Electrification (Demand driven augmentation in the LV network & flexible services).

**Other information**

AusNet also provided a document describing its EV strategy and its summer and winter readiness programs and a Digital Business Case for its proposed DSO program (which we assess in our ICT report).

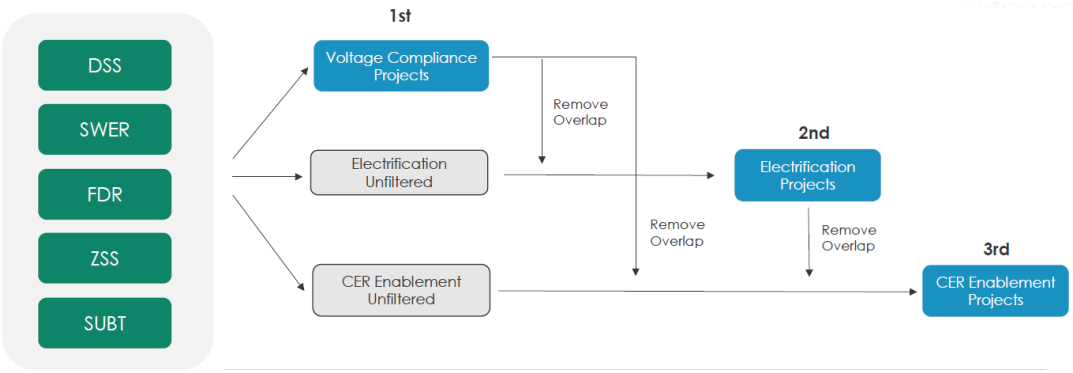
Notes: (a): Electricity Distribution Price Review, 31 January 2025
(b): As this was not within our scope, we do not consider these documents further

### Information provided at our onsite meeting with AusNet

850. Included within its onsite meeting presentation, AusNet provided the diagrams shown in Figure 5.2 Figure 5.3.

851. The first of these provided us with an essential perspective on how AusNet considered the three CER-related programs to inter-relate, but which was not evident from our reading of the submission documents, together with AusNet's recognition of the need to address the potential for overlap between the programs.

*Figure 5.2: CER and electrification program – AusNet's order of priority*




*Source: Onsite presentation deck, 3 April 2025, page 95*

852. As is shown in Figure 5.3, this information also provides AusNet's core statement as to what is driving each of the three programs. This helps particularly in differentiating between its Voltage Compliance and its Demand driven LV Augmentation projects.

*Figure 5.3: AusNet's description of the drivers for the three CER-related programs*

**1st Priority - Voltage Compliance**
Voltage non-compliance can lead to equipment failure and safety hazards.

**2nd Priority - Demand-Driven LV Augmentation:**
Ensuring customers can transition to all electric appliances without experiencing supply constraints.

**3rd Priority - CER Enablement:**
Focuses on optimizing customer investment in renewables, and improving network flexibility, but is secondary to ensuring a reliable and safe electricity supply.

*Source: Onsite presentation deck, 3 April 2025, page 95*

### Information request – Clarification of what AusNet considers to be CER-related projects

853. Following the onsite meeting we sought information from AusNet to identify what it considered to be CER-related expenditure in its regulatory submission. AusNet provided the information that we reproduce in Table 5.1.

854. We have combined AusNet's response with other information provided at the onsite meeting (as above) to add the column headed '*Driver summary*' in which we have distinguished between AusNet's 'reactive' compliance program, and what we had by then identified as three proactive augex programs, and which AusNet had explained as being driven by its assessments that these projects were designed to provide a net economic benefit.

855. We were able to relate this to the scope of our review, noting:

- That the CER enablement program and AusNet's summer/winter readiness program were not within our scope, and
- AusNet's inclusion of its ICT DSO project as representing its CER-related ICT project, which was within our scope.

*Table 5.1: AusNet overview listing of its proposed 'CER' expenditure*

| Program | Business case name | Capex model line name | $m[(a)] | Revenue Proposal chapter | Summary of program | *Driver summary (added by EMCa)* |
|---|---|---|---|---|---|---|
| LV augex – demand-driven | Demand-driven augex (LV augmentation) BC | 97 LV Augex (Electrification & Flexible Services) | 123 | 6.6.4.9 | Economic augmentation to accommodate demand growth | *Proactive Augex. AusNet Economic model: Priority 2* |
| CER enablement | CER Enablement Business Case | 98 CER Enablement | 36 | 6.8 | Economic augmentation required to unlock CER (LV, HV and DVM). Uses the same model as LV augex above, with CER enablement given 3rd priority. | *Proactive Augex. AusNet Economic model: Priority 3* |
| Quality of supply program | Voltage compliance and quality of supply program Business Case | 79 Supply improvement | 7 | 6.15.4.2 | BAU response to voltage complaints | *Augex: Reactive* |
| Voltage compliance program | | 78 Steady-State Voltage Compliance Program | 24 | 6.15.4.1 | Economic approach to meeting voltage compliance obligations. Uses the same model as LV augex above, with voltage compliance given 1st priority. | *Proactive Augex. AusNet Economic model: Priority 1* |
| Summer/ winter readiness | Summer and winter network readiness Business Case | 81 FY27-31 Summer/ Winter Network Readiness Program – LV Network Capacity (overloads) | 5 | 6.6.4.10 | Proactive program to prepare network for expected peak demand in summer and winter periods, through minor network upgrades | *Not initially recognised as part of CER, but some overlap of drivers* |
| DSO and flexible exports | Digital Business Case – Distr bution System Operator | 14 DSO/Future Service provider hub | 37 | 6.13.4 | Flexible exports and load connections; integration of our systems to AEMO's CER data exchange | *ICT program: Economic CBA* |

Note: (a) Unescalated direct costs ($2023-24)

*Source: AusNet information provided subsequent to onsite meeting*

### Further information requests

856. Following the onsite meeting and AusNet's clarification of the relationship between the six programs referred to in Table 5.1, we were able to focus our attention on understanding of the modelling that AusNet sought to rely on to justify the extent of the programs that it proposed, and the associated expenditure, in economic terms.

857. The models that AusNet provided with its regulatory submission did not provide sufficient information for this purpose, as they provided only a hard-coded line of annual benefit values with no underlying calculations demonstrating how they had been derived. In an Information request, we sought a response to 22 questions relating to CER,[194] which can be summarised as seeking:

- The economic models that AusNet described at the onsite meeting
- Outputs from the technical models that AusNet showed as producing inputs to the economic models, and

[194] IR20, questions 82 to 104

- Information to enable us to understand how AusNet had modelled and derived costs and benefits, including its input assumptions, information on voltage compliance and on its assessment of optimum timing for each intervention included in its proposed program.

858. AusNet provided the models that we requested, together with some worked examples and explanations. From this, we were able to gain an understanding of AusNet's modelling and the relevance of key input assumptions, sufficient to enable our review. However, the models provided were locked such that we were not able to undertake sensitivity analysis or alternative calculations.

### 5.2.2 Overview of AusNet's CER and electrification strategy

#### AusNet's proposed program encompasses CER and electrification

859. AusNet describes its CER strategy in a document entitled '*Consumer Energy Resources (CER) Integration Strategy*', provided with its regulatory submission. AusNet states that for the purpose of this strategy, it defines CER as:

- Rooftop solar
- Batteries in the low voltage (LV) network (household and community batteries)
- Electric vehicles (EV) and smart EV chargers (home or street level)
- Flexible load (e.g., controllable hot water systems)
- Stand-alone power systems (SAPS), and
- Microgrids.[195]

860. We have not been asked to review microgrids or SAPS expenditure. On the other hand, though not referred to directly in its list above, AusNet's strategy document makes reference to electrification as a driver of proposed expenditure and its proposed capex is dominated by an augex program that it proposes to address this. For the purpose of this review, and since later we find that it is derived from a common set of modelling, we refer to CER-related expenditure as encompassing electrification-driven augmentation.

#### AusNet states that it first identifies least-cost network solutions, then identifies the extent to which it can apply non-network solutions to defer the need for network solutions

861. AusNet describes a process whereby it seeks to identify prudent and efficient CER investment by first estimating its intrinsic hosting capacity, then assessing where it might require investment to meet steady-state voltage compliance requirements and modelling to seek least-cost solutions. AusNet refers to considering the following network solutions:

- Dynamic voltage management system (DVMS)
- Distribution substation and SWER line upgrades, and
- Transformer tapping and phase rebalancing.[196]

862. AusNet states that it has first *'…estimate(d) the traditional network investment required to enable and (sic) efficient and prudent integration of CER. We then consider whether we can efficiently defer this network investment through other options, including through Flexible Exports or other flexible services and non-network solutions that are included in our transition to the role of the DSO.'*[197]

195 AusNet CER Integration strategy, page 2

196 As above, page 15

197 As above, page 16

### AusNet proposes to introduce new services as part of non-network solutions

863. In the diagram that we reproduce as Figure 5.4, AusNet illustrates the new services that it intends to introduce during the next regulatory period, and which will be enabled by its proposed DSO hub. With regard to flexible exports, AusNet states that:

> *'As we've already invested in capabilities to meet the new VEBM requirements, our transition to Flexible Exports for all customers from 1 July 2026 will come at a much lower cost than if we were starting from scratch. By moving to offer this to all customers, we are making the most of our foundational investment to date, as well as increasing network utilisation while unlocking more exports as we are only constraining solar exports at the time when they are likely to either cause network constraints or create minimum demand risk. This is a more efficient and fairer way of managing exports than applying conservative static constraints that are on a 'first come first serve' basis.'*[198]

*Figure 5.4: New CER services AusNet will offer during 2026-31*


*Source: AusNet CER Integration strategy (figure 13)*

### AusNet has assumed no ability to control or offer managed EV residential charging

864. AusNet states that it considers that customers *'…are not ready to accept….controlled or managed EV charging.'* AusNet states that '*(f)or that reason we have not assumed that residential customers will be subject to managed EV charging' during the next regulatory period*.[199]

## 5.2.3 Proposed CER projects and proposed expenditure

#### Total proposed CER-related augex, ICT capex and opex

865. AusNet proposes total CER-related expenditure of $266.7m. As shown in Table 5.2, the majority of this proposed expenditure is for augmentation of the network. AusNet presents three of these programs as being derived from its modelling through which it aims to identify economic proactive interventions. Through this model, AusNet forecasts the need for proactive solutions, with the following prioritisation:

- Priority 1: Steady state voltage compliance program
- Priority 2: LV augex work identified under the LV Augex (Electrification and Flexible Services) program, and
- Priority 3: Work identified under the CER Enablement program.

198 AusNet CER Integration Strategy, page 18

199 As above, page 15

866. A fourth CER-related augex project is a proposed Supply Improvement allowance for reactive compliance work in response to voltage complaints which represents a continuation of normal DNSP response to issues identified through such processes.[200]

867. AusNet proposes a single 'digital' project with capex of $40.8m to provide DSO capability and to enable Flexible Services. As an integral part of AusNet's proposed CER-related programs, we assess this project in the current section.

868. Of the proposed total expenditure, $254.9m is for capex, with $214.1m being augex and the remainder for the ICT.

869. Two proposed opex step changes combine to $11.8m over the period. From a reconciliation viewpoint, the ICT – DSO opex step change is included within AusNet's overall proposed ICT opex step change, which we include in our aggregate assessment of ICT opex step changes in our separate report.[201] AusNet's CER-specific non-ICT opex step change is separately identified in its opex model and we assess this in the current report.

*Table 5.2: AusNet's proposed CER expenditure - $m, 2026*[202]

| | FY27 | FY28 | FY29 | FY30 | FY31 | TOTAL |
|---|---|---|---|---|---|---|
| **Augex** | | | | | | |
| Priority 1: Steady-State Voltage Compliance Program | 6.3 | 4.0 | 6.1 | 3.3 | 7.3 | **26.9** |
| Priority 2: LV Augex (Electrification & Flexible Services) | 21.5 | 23.5 | 22.2 | 29.0 | 42.3 | **138.5** |
| Priority 3: CER Enablement | 9.5 | 7.3 | - | 23.6 | - | 40.4 |
| Supply improvement | 1.8 | 1.8 | 1.7 | 1.5 | 1.5 | **8.4** |
| **Subtotal - Augex** | **39.1** | **36.7** | **29.9** | **57.4** | **51.1** | **214.1** |
| **ICT capex** | | | | | | |
| DSO/Future Service provider hub | 11.5 | 11.5 | 4.4 | 10.0 | 3.4 | **40.8** |
| **Subtotal - ICT** | **11.5** | **11.5** | **4.4** | **10.0** | **3.4** | **40.8** |
| **TOTAL Capex** | **50.5** | **48.2** | **34.4** | **67.4** | **54.5** | **254.9** |
| **Opex step changes** | | | | | | |
| ICT - DSO | - | 0.8 | 0.8 | 0.8 | 0.8 | **3.3** |
| Non-ICT - Flexible services and non-network solutions | 0.5 | 1.1 | 1.7 | 2.3 | 2.9 | **8.5** |
| **TOTAL Opex** | **0.5** | **1.9** | **2.5** | **3.2** | **3.7** | **11.8** |
| **Total expenditure** | **51.1** | **50.1** | **36.9** | **70.5** | **58.2** | **266.7** |

*Source: EMCa, from AusNet capex model, with projects identified based on table provided by AusNet following onsite meetings.*

### Projects within scope

870. As we refer to in the introduction, we have been asked to review specific CER programs. Our scope comprises all projects shown in Table 5.2, except for 'Priority 3: CER

200 AusNet also has a proactive augex program to prepare the network for expected summer and winter peaks, and which is additional to those above. AusNet included reference to this in its response to a request from us to list all CER projects, but it is not otherwise presented as a CER project in its regulatory proposal, therefore we have not included it in our aggregate CER cost table above. It is also not within the scope of projects that we have been asked to assess.

201 EMCa report to AER on AusNet's proposed ICT and cyber security projects

202 For clarity, the augex shown in this table is also included in Table 4.1, which lists all of AusNet's proposed augex. In that table, the LV Augex (Electrification and Flex ble Services) project above is included within AusNet's proposed demand-driven augex category, the Steady State Voltage compliance and Supply Improvement projects comprise AusNet's 'compliance' category within its total augex, and the CER Enablement project is referred to as DER Integration.

Enablement'. Excluding this program, the scope of our review therefore comprises $173.7m of augex.

#### AusNet's economic modelling methodology

871. As we have referred to above, AusNet has derived its proposed proactive Steady-State Compliance augex and proactive LV electrification projects from an integrated set of technical simulation models together with economic models (one for each program). We describe the economic modelling methodology that AusNet has applied in Appendix A, along with generic issues that we have with this modelling. Our assessment of AusNet's modelling informs our review of the two programs that rely on this, as described in section 5.3 and section 5.4 below.

## 5.3 AusNet's Priority 1 program: Compliance augex

### 5.3.1 What AusNet has proposed

872. AusNet includes two complementary programs in its Proposal, as shown in Table 5.3.

873. The Steady-State Voltage Compliance program ('voltage compliance program') is designed to proactively undertake network solutions to improve over-voltage compliance from the current 95% compliance level to 96.6% compliance on average over the course of the next RCP.

874. The Supply improvement program (also referred to by AusNet as the Quality of Supply program) is positioned as a recurrent, reactive response to customer power quality complaints, such as harmonics, unbalance, and voltage flicker. The supply improvement program is designed to remedy network-driven power quality issues that are not addressed by the voltage compliance program.

*Table 5.3: AusNet proposed compliance augex - $m, real FY2026*

| Compliance | 2026-27 | 2027-28 | 2028-29 | 2029-30 | 2030-31 | Total |
|---|---|---|---|---|---|---|
| Steady-State Voltage Compliance | 6.3 | 4.0 | 6.1 | 3.3 | 7.3 | **26.9** |
| Supply improvement | 1.8 | 1.8 | 1.7 | 1.5 | 1.5 | **8.4** |
| **Total** | **8.1** | **5.8** | **7.8** | **4.8** | **8.8** | **35.3** |

*Source: EMCa table, derived from AusNet SCS capex model*

### 5.3.2 Voltage compliance program

#### Maintaining compliance

##### AusNet's obligation is to achieve 'functional compliance'

875. Under Victoria's EDCOP, AusNet is required to achieve network-wide 'functional' voltage compliance. Functional compliance is met if:

> *'… the limits in Table 2 of AS 61000.3.100 (up to 1% of measurements below 216 V and up to 1% of measurements above 253 V) are maintained across at least 95% of a distributor's customers.'* [203]

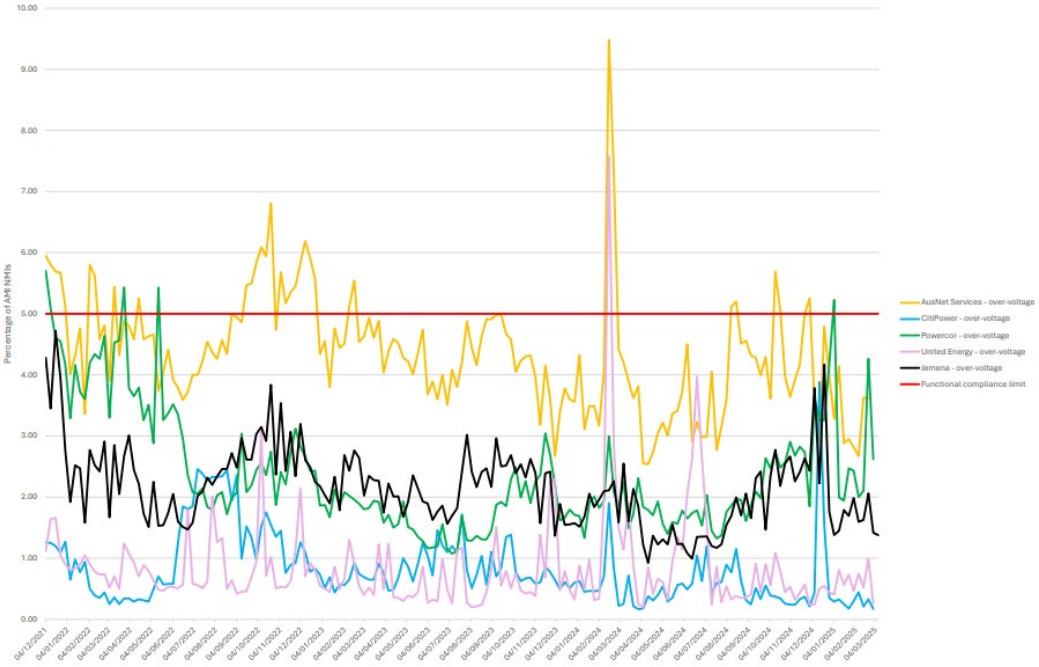
##### AusNet has maintained functional compliance over the current RCP

876. AusNet advises that it has undertaken work in the current RCP to maintain compliance within the functional compliance threshold despite strong growth in solar PV connections in

[203] Essential Services Commission, Electricity Distr bution Code of Practice, Version 1, October 2022, page 81

its network. Further it expects to maintain compliance for the balance of current RCP through its ongoing work program.[204] Figure 5.5 shows AusNet's (and other Victorian DNSPs') overvoltage compliance performance up to early March 2025. It shows that AusNet's network was subject to several minor excursions in late calendar year 2024, and one large excursion in early CY24. There had been no excursions above the 5% threshold in 2025 through to March. The spike in February 2024 that affected several DNSP's networks is not explained.

*Figure 5.5: % of NMIs above 253V for more than 1% of the time (over-voltage)*




*Source: www.esc.vic.gov.au/electricity-and-gas/market-performance-and-reporting/voltage-performance-data*

877. We asked AusNet to provide the historical expenditure for voltage compliance expenditure, separately identifying voltage compliance expenditure and supply improvement expenditure. AusNet provided the information summarised Table 5.4 and advised that the annual amounts represent its total reactive expenditure in response to non-compliant over-voltages and advised that discrimination between voltage compliance and supply improvement '*was not readily available*.'[205] Nonetheless, in its business case, AusNet provides the historical Quality of Supply Program current RCP expenditure, which is expected to be $18.5 million (nominal).[206] The responses are not directly comparable because of the different bases for the expenditure, however, this indicates that voltage compliance expenditure will be less than $10 million ($2026) in the current RCP. We discuss the supply improvement (aka Quality of Supply Program), after our assessment of the proposed 'voltage compliance' program.

878. The proposed expenditure represents a 40% uplift compared to the aggregate expenditure in the current RCP.

204 ASD - AusNet - Voltage compliance and quality of supply program BC - 31012025 - PUBLIC, page 5

205 AusNet response to IR020 q35

206 ASD - AusNet - Voltage compliance and quality of supply program BC - 31012025 – PUBLIC, Table 4

*Table 5.4: Supply improvement program – non-compliant overvoltages + complaint responses ($m 2026)*

| 2022 | 2023 | 2024 | 2025 | 2026 (est) | Total |
|---|---|---|---|---|---|
| 5.56 | 3.94 | 6.55 | 7.87 | 1.46 | **25.38** |

*Source: AusNet response to IR020 q35*
*Note: AusNet also identified $1.64m expenditure in 2021*

### Overvoltage and potential solutions

#### This program is directed to resolving over-voltage issues

879. AusNet states that under-voltages across its network are well within the functional compliance limit.[207] Under-voltages are typically experienced at times of high demand.

880. Network over-voltages typically arise at times of minimum demand, which is usually when there is high solar PV output and mild weather conditions.

#### To the extent that over-voltage issues are present, AusNet has identified a reasonable set of network capex and opex solutions to address them

881. AusNet has identified the following solutions which it considers to be credible for addressing over-voltage issues:

- Dynamic voltage management (DVM)
- Network capex: switched reactors, transformer upgrades and replacements, new transformers, new feeders and circuits, splitting or re-configuring circuits, and
- Network opex: tap changes, float voltage setting, line drop compensation, and phase balancing.

882. In our experience, all of these solutions have been deployed successfully by distribution utilities to address over-voltage issues, with the network opex solutions typically implemented first, followed by DVM schemes at zone substations, and with long-life network augmentation the last resort. Several utilities have made concerted efforts to ensure that inverter compliance to AS4777 is improved as this has the effect of helping with voltage management. AusNet has trialled a DVM solution but has not yet widely implemented it.

#### Non-network solutions are likely to be too costly in the short-medium term

883. AusNet has concluded that whilst battery storage is a technically viable means of deferring or displacing a network augmentation solution, it considers it to be uneconomic when counting network benefits alone (i.e. market benefits are required). It does however suggest it will examine the economic viability of storage on a case-by-case basis. This is a reasonable position for now.

### Accounting for inverter compliance

#### AusNet may not have fully incorporated the benefit of progressive improvement of inverter compliance to AS4777

884. AS4777 was introduced in 2015 and was enhanced in 2020 and 2024 to reinforce performance of inverter systems installed at residential and small-commercial premises to help manage CER integration. AS4777.2:2020 mandates (among other things) use of volt-watt and volt-VAr settings.[208]

885. As described below, AEMO has recognised that up to 40% of grid-connected inverter systems may not comply with AS 4777.2, however it does not refer explicitly to inverter setting compliance in Victoria or in AusNet's network.

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207 ANS, Voltage Compliance and Quality of Supply program Business Case – 31012025, page 7

208 These settings respond to voltage excursions by either curtailing PV output (in response to high voltages) or by drawing reactive power (in response to low voltages).

*Figure 5.6: AEMO information on inverter systems and their compliance*

**AS/NZS 4777.2**

*AS/NZS 4777.2 specifies the expected performance and behaviour of inverters at low voltages (such as households or small-scale commercial) and the necessary tests for compliance…*

**Inverter Inspections**

*… as much as 40% of grid-connected inverters installed with rooftop solar PV systems since 2016 may not comply with some of the mandatory settings prescribed in AS/NZS 4777.2:2015 and the relevant Distribution Network Service Provider (DNSP) connection agreements. This is causing issues for grid reliability and security that without rectification will limit consumers' choice to invest in DER.*

*…[c]ompliance with the standards, and ensuring all settings are correct, is essential to increase hosting capacity of rooftop solar PV and other DER on the grid in the coming years, while maintaining grid reliability.*

*Source: www.aemo.com.au/initiatives/major-programs/nem-distributed-energy-resources-der-program/standards-and-connections/as-nzs-4777-2-inverter-requirements-standard*

886. AusNet notes that (i) customers with the mandated settings will support CER hosting capacity (i.e. by helping control voltage excursions), and (ii) the number of compliant customer inverters is likely to increase over time. [209]

887. The latter is a reasonable assumption because of (i) the increasing ability using AMI data to detect non-compliant systems, (ii) the efforts of the Clean Energy Regulator, the Clean Energy Council, and AEMO which are likely to help correct non-compliant installations,[210] and (iii) all new and replacement inverters are required to comply with AS4777.2:2024, which specifies even broader mandatory inverter settings and functionality.

888. It appears that AusNet's cost-benefit modelling does not explicitly take the impact of improved inverter compliance into account. We consider that this as a potential mitigating factor to AusNet's proposed increased expenditure on these programs.

### AusNet's option assessments

#### AusNet's 'do nothing' analysis significantly overstates the monetised risk, leading to an overstatement of the economic case for undertaking network augmentation

889. AusNet's counterfactual assumes sufficient expenditure is incurred to respond reactively to customer complaints, but no proactive voltage compliance is undertaken. It states that the base case is likely to result in voltage non-compliance of 6% by the end of the next RCP.

890. AusNet's analysis values safety risk[211] over the study period at $152.8 million (PV), with a further $77.2 million (PV) monetised risk from the other sources.

891. AusNet states that it considers that over-voltages may cause customer equipment damage and reduced life spans which is a potential safety risk for appliances overheating and catching on fire.[212] In its economic modelling of the risk-cost of 'doing nothing', AusNet's quantification of the claimed safety risk cost arising from overvoltage and consequent 'overconsumption' dominates its assessment of overall risk-cost, as we show in Figure 5.7.

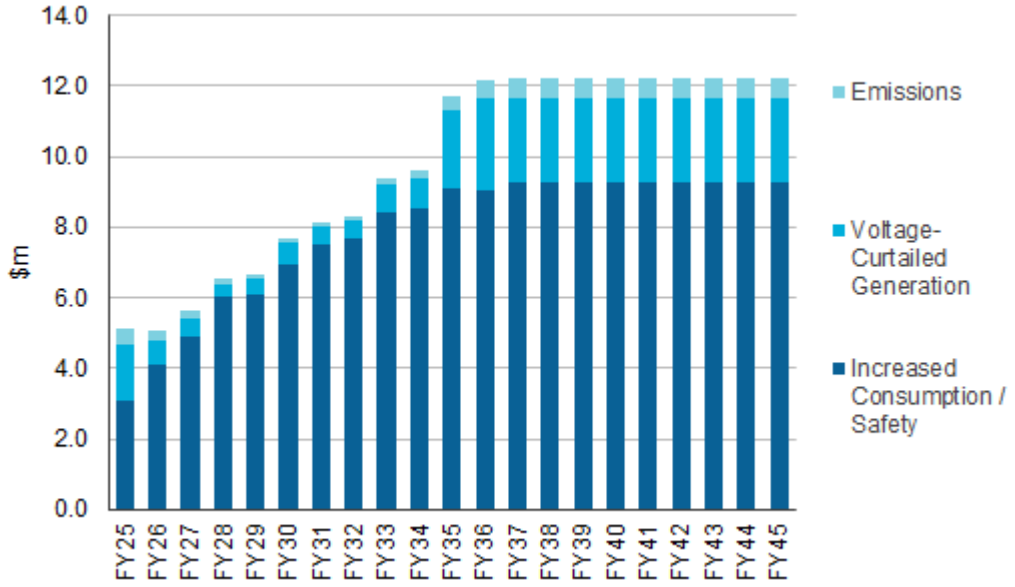
209 ANS, Voltage Compliance and Quality of Supply program Business Case – 31012025, page 12

210 www.aemo.com.au/initiatives/major-programs/nem-distributed-energy-resources-der-program/standards-and-connections/as-nzs-4777-2-inverter-requirements-standard

211 ASD - AusNet - Voltage compliance and quality of supply program BC - 31012025, page 14. These figures are in $2024.

212 As above

*Figure 5.7: AusNet's assessment of voltage compliance 'do nothing' risks ($m)*




*Source: EMCa, from AusNet Voltage Compliance economic model 31012025, sheet 'Do nothing risk'*

892. On review, we find that AusNet has used a monetised safety risk-cost that it calculates as a multiplication factor of the retail electricity price. Specifically, AusNet:

- Assumes a safety risk as a function of the retail price and the energy 'over-consumed' due to the overvoltage, then
- Multiplies that retail price by a Disproportionality Factor of 6 and presents this as a quantification of the safety risk-cost arising from such 'overconsumption'.

893. AusNet does not provide evidence to support a risk-cost from overvoltage calculated on this basis. Neither does AusNet provide evidence of safety events or of the extent to which it has experienced instances of customer equipment damage arising from overvoltage at the residential level. From our experience in the sector, we have observed (at the residential level) only occasional instances of equipment damage arising from overvoltage and we have never encountered an instance that led to personal safety or property damage arising solely from overvoltage supplies in the voltage range that is relevant for consideration here.

894. We also observe that AusNet's modelling of the safety risk suggests that there is already (in 2025) a safety risk which it quantifies at $3m in this year alone. In quantified safety-risk terms, this would equate to around a 50% annual probability of a risk leading to a fatality. We consider it highly implausible that AusNet is carrying a risk at anything like this level.

895. We consider that AusNet's assumed value for its current safety risk, and of the increasing risk-cost of 'doing nothing', are significantly overstated. This in turn leads AusNet to consider an overstated economic benefit that would arise from its proposed augex to address the risk that it has calculated, in 'Option 1' which we discuss below.[213]

### Option 1 (AusNet's proposed option): AusNet's proposed capex on network solutions is not prudent because it significantly overstates the benefit of the proposed proactive investment

896. AusNet's recommended option is predicated on maximising NPV using the costs and avoided risks from the most effective solutions drawn from its identified solutions 'toolbox'. This leads it to recommend $23.9m capex and $0.6m opex over the next RCP because of the estimated $200m benefits. AusNet states that the investment will avoid 87% of the total 'do nothing' risk cost and will improve over-voltage non-compliance from 5% to 3.4%.

213 We provide further observations on AusNet's economic modelling of CER-related risk-costs in Appendix A

897. AusNet considers DVM, network opex, and selected network augmentation[214] solutions to be economically justified.

898. As we discuss under our assessment of the 'do nothing' option above, we consider that AusNet's forecast of the risk-cost of this option is significantly overstated. For the same reasons, the risk-cost benefit that AusNet estimates from undertaking the proactive augex investment program that it proposes to address this risk, is significantly overstated. AusNet has not justified the level of benefits that it forecasts from this proposed program, and we consider that the level of overstatement inherent in its calculations is such that it has not demonstrated that this program would provide a net economic benefit.

899. Consequently, we consider that AusNet has not demonstrated that the proactive program that it proposes is justified.

#### Option 2 is unjustifiably expensive

900. AusNet's second option is to provide compliant voltages to every customer at all times. This is well beyond the functional compliance requirement and with estimated capex of $764 million is clearly unjustified.

#### Benefits sensitivity and cost estimation

#### Cost estimates are likely to be reasonable

901. AusNet was able to draw upon the results of a recent DVM trial and recent network solutions (capex and opex) in estimating cost estimates for each solution. We consider therefore that the cost estimates for this program (and the Supply improvement program) are likely to be reasonable.

#### AusNet's claimed benefits are most sensitive to increased demand

902. AusNet has included the results of its sensitivity study, which shows that a 5% increase in demand will reduce the NPV by nearly 20% (i.e. less over-voltage). The results are also sensitive to the assumed discount rate and failure probabilities, but these are second-order impacts. Given our other concerns, the sensitivity to demand reinforces our view that the proposed voltage compliance improvement program is not likely to represent a prudent level.

#### Findings

#### AusNet has not justified undertaking the proactive expenditure that it has proposed to maintain steady state voltage compliance

903. AusNet has sought to justify undertaking a proactive voltage compliance program directed to address potential under-voltage non-compliance on the grounds that it will provide a net economic benefit. AusNet relies on its economic analysis as justification for its proposal, However, primarily due to unsubstantiated evidence for its key input assumptions regarding quantification of a claimed safety risk, AusNet has not demonstrated that such a program would provide a net economic benefit and we therefore conclude that AusNet has not demonstrated that its proposed investment is justified.

### 5.3.3 Supply improvement program

#### Assessment

#### AusNet's proposed program is based on common industry practice

904. It is consistent with AusNet's quality of supply obligations to investigate customer power quality complaints and rectify associated network issues. Typically, opex solutions (phase

[214] New ZSS reactors at 7 sites, new voltage regulators at 5 sites, and a new distribution transformer at one site

balancing, manual tap changes on distribution transformers) are implemented first and only if necessary are network capex solutions deployed. This is our understanding of AusNet's approach.

### AusNet expects to spend $18.5 million on its Supply Improvement Program in the current RCP

905. AusNet reports that it expects to spend $18.5 million (nominal) in the current RCP on its Quality of Supply Improvement Program[215] to resolve power supply issues raised by customers, and that it is:[216]

> *'…predominantly an urgent program (mainly triggered by the urgency of customer complaints due to the lack of permanently installed quality of supply metering across the network), to address quality of supply issues.'*
>
> *In many cases, the causes for voltage complaints are solar inverter trips due to high voltages and identification of high voltages by solar PV installers at customer premises during the installation process. Whilst a substantial portion of these could be resolved through a targeted Voltage Compliance Program … there remains a base level of customer complaints that are not directly attributed to over-voltage, that require a response to other quality of supply issues such as harmonics, flicker, unbalance, sags or swells…'*

906. However, as shown in Figure 5.8[217] AusNet's actual expenditure up to 2024 was as per its regulatory allowance for this period. The figure includes additional forecast expenditure with AusNet expecting to commence its proactive LV Network Capacity Program the latter years, leading to a ramp-up in capex. In other words, it appears that its actual expenditure on supply improvement was otherwise similar to its allowance.

### Electrification of gas and transport is likely to progressively assist with over-voltage compliance

907. As discussed in section 5.4, AusNet identifies that 'electrification of gas' (e.g by replacement of gas appliances with electricity-based appliances) and 'electrification of transport' (e.g. increasing penetration of EVs) will lead to increased electricity demand and under-voltage issues. Electrification will therefore tend to increase minimum loads, which should diminish the extent of non-compliant over-voltages over time.

### AusNet's forecast for its Supply Improvement Program is based on its allowance for the current period, which we consider a reasonable basis

908. To address the base level of customer complaints it expects in the next RCP, AusNet proposes expenditure on its supply improvement program at the current regulatory control period allowance level. The $8.4 million proposed assumes:

- No increase in complaints, and
- Increasing solar PV penetration.

909. In the absence of information to the contrary, we consider that it is reasonable for the allowance for the next period to be similar to AusNet's allowance for the current period.

#### Finding

910. We consider AusNet's approach to forecasting a capex allowance for supply improvement in the next RCP to be reasonable, on the basis of its current period actual expenditure. On reviewing AusNet's calculations, however, we find that it has added a risk allowance. We

215 ASD - AusNet - Voltage compliance and quality of supply program BC – 31012025, Table 4

216 ASD - AusNet - Voltage compliance and quality of supply program BC – 31012025, page 9

217 Which shows the AusNet expenditure from three programs: 'Customer Supply Compliance Program', LV Network Capacity Program', and 'Eliminating Network Operational Deficiencies Program' in the current RCP

consider that the addition of such an allowance is not justified, particularly where the allowance is for a series of individually relatively small investments that AusNet has ample experience with.

### 5.3.4 Summary of findings on Priority 1: Compliance augex

#### Proactive Steady State Voltage Compliance investment not justified

911. AusNet has sought to justify on economic grounds making a series of proactive augex investments to maintain overvoltage compliance. However, AusNet has significantly overstated the claimed economic benefits of such investment and from our review of the assumptions and modelling methods that AusNet has used, we consider that its case for undertaking this investment is not justified.

#### An allowance for continuing management of over-voltage is justified and can be allowed for under its existing Supply Improvement program

912. We consider that some allowance for continuing management of over-voltage issues as they arise, is warranted, noting that AusNet has proposed an allowance for 'supply improvement' that is essentially the same as its allowance for the current period. We consider that an allowance at around this level is justified, noting that this can be directed towards a suite of measures that AusNet can take as required, and which may include some proactive investment.

#### AusNet can adopt a range of measures to manage over-voltage

913. We consider that targeted proactive measures when combined with reactive rectification, the introduction of flexible export services, the gradual increase in inverter AS4777 compliance, likely increasing availability of battery storage, the effects of gas and transport electrification, and likely progressive change in customer energy management behaviour, are likely to help ensure AusNet continues to consistently meet its over-voltage compliance obligations over the course of the next RCP.

## 5.4 AusNet's Priority 2 program: LV augex (Electrification and Flexible Services)

### 5.4.1 Background

914. AusNet proposes capex of $138.5m and an opex step change of $8.5m that comprises of a network augmentation 'electrification' component and a 'flexible service' component – refer to Table 5.5. The program is designed to reduce expected unserved energy (EUE) from forecast thermal overload of distribution substations (DSS) and SWER lines driven by electrification of homes and transport.

915. AusNet reports that demand growth from electrification will exacerbate already high forecasts of EUE from curtailment of load at DSSs of approximately 8.6GWh (2024) and 1.9GWh curtailment of load supplied by SWER lines. Rather than the forecast EUE increasing by 0.5 GWh (on DSSs) and by 0.2 GWh (on SWER lines) without any intervention over the course of the next RCP, the proposed capex and associated opex will, according to AusNet's modelling, reduce EUE by 7.9 GWh (DSS) and 1.8 GWh (SWER) over the next RCP. AusNet estimates the NPV of the proposed investment to be $3.5 billion ($2024).[218]

[218] ASD - AusNet - Demand driven augex (LV augmentation) BC - 31012025 – PUBLIC. Table 1

*Table 5.5: AusNet proposed LV augex (electrification and flexible services) - $m, real FY2026*[219]

| Compliance | 2026-27 | 2027-28 | 2028-29 | 2029-30 | 2030-31 | Total |
|---|---|---|---|---|---|---|
| Capex | 21.5 | 23.5 | 22.2 | 28.9 | 42.3 | **138.5** |
| Opex step change | 0.5 | 1.1 | 1.7 | 2.3 | 2.9 | **8.5** |
| **Total** | **22.0** | **24.6** | **23.9** | **31.2** | **45.2** | **147.0** |

*Source: EMCa table, derived from AusNet SCS capex model, and opex from AusNet opex model (Flexible services and non-network solutions)*

## 5.4.2 Historical and forecast LV augex

### AusNet's expected LV augmentation expenditure exceeds the AER allowance in the current period

916. Figure 5.8 shows AusNet's current and expected LV augex over the current and next RCP, with historical values in nominal terms and the next RCP augex shown in real $2026.

917. The current RCP comprises three programs:[220]

- Customer supply compliance program ($6.9 million nominal),
- LV network capacity program ($13.3 million nominal), and
- Eliminating network operational deficiencies program ($1.6 million nominal).

918. The pro-rated AER allowance is $21.8 million (nominal) whereas AusNet's cumulative forecast is $33.3 million (nominal). The reason for the increase in FY25 and FY26 is commencement of AusNet's proactive capacity improvement program.[221]

### The proposed five-fold increase in LV augex capex is due to a change in investment approach by AusNet

919. The increase in forecast capex is due to AusNet adopting a proactive approach to both improving voltage compliance and customer reliability by investing in what it considers to be economically justified augex and flexible services.

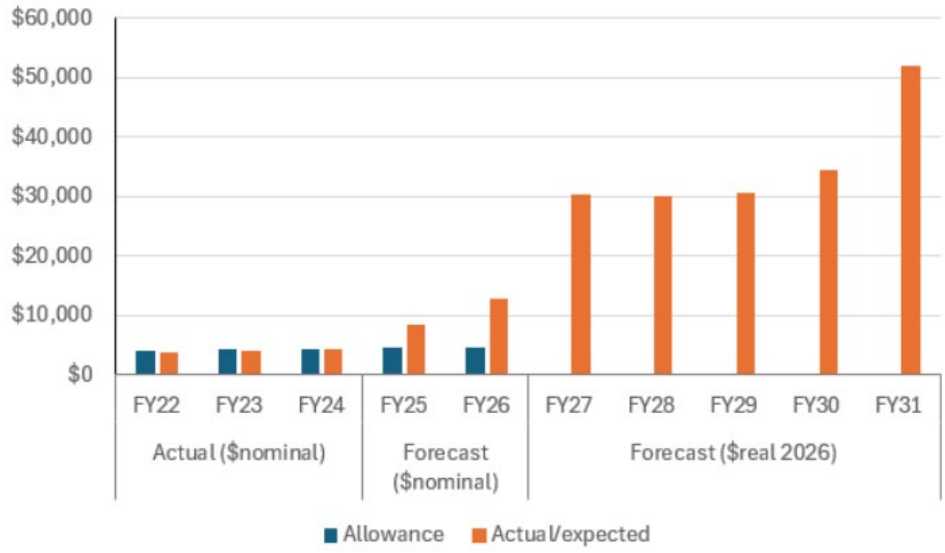
920. We report on our assessment of the Compliance program in section 5.3 and the LV augex (electrification and flexibility services) program in the current section. A Summer & winter readiness program is also included in AusNet's forecast but is not within our scope.

219 In its business case, AusNet shows Network opex of $4.6m and Flexible Services opex of $6.0m, for a total of $10.6m. These amounts are in $2024. We have not been able to reconcile these to the amounts that AusNet proposes in its regulatory submission, but we rely on its regulatory submission opex model as the definitive source.

220 AusNet response to IR009, Q29(b)

221 AusNet response to EMCa IR009 question 29i(b); AusNet advises in the response that the expected value for FY26 includes planned and committed project expenditure; projects under development have not been included in the figure, but have been included in the business case economic model

*Figure 5.8: AusNet's actual and expected capex on LV augmentation ($,000)*




*Source: AusNet response to EMCa IR009 question 29i(b); and AusNet SCS capex model*

## 5.4.3 Assessment

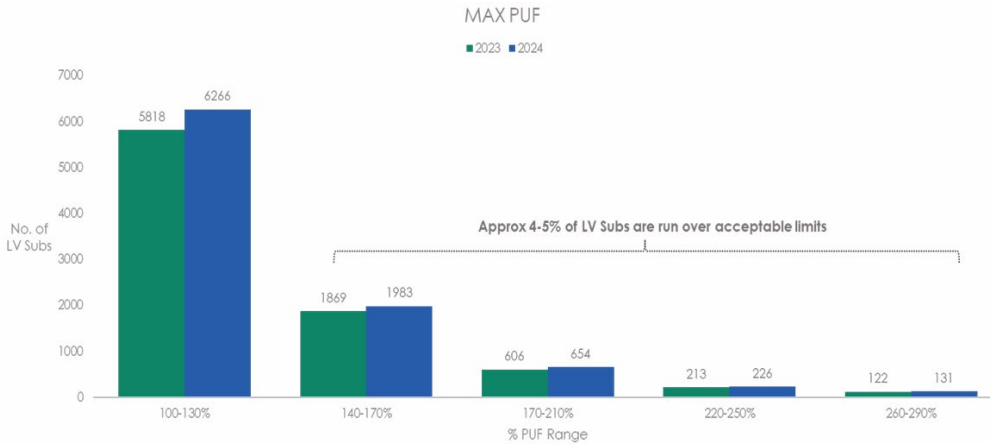
### Substation utilisation and the extent of load shedding

#### Some of AusNet's LV substations are currently highly utilised

921. As shown in Figure 5.9, AusNet reports that a significant number of distribution substations (DSS) are loaded well beyond their nameplate rating during periods of maximum demand. As AusNet reasonably state, loading of DSS above 140% is typically a trigger for considering some form of intervention. Based on AusNet's numbers, there are approximately 3,000 significantly overloaded DSS in its system. Further, 18.3% of LV substations are over 45 years old. This provides a prima facie case for continuing to invest in relieving DSS overloads throughout the next RCP, particularly if peak and energy demand grows.

922. To put AusNet's chart into perspective, however, AusNet has over 62,000 DSS, almost all of which are operating at less than 100% utilisation.

*Figure 5.9: Power utilisation factor of AusNet's distribution substations (2023, 2024)*[222]




*Source: On-site presentation, slide AusNet EDPR Onsite Workshop – Day 2 Pack CONF, slide 87*

222 AusNet's chart shows only those substations run at >100% PF.

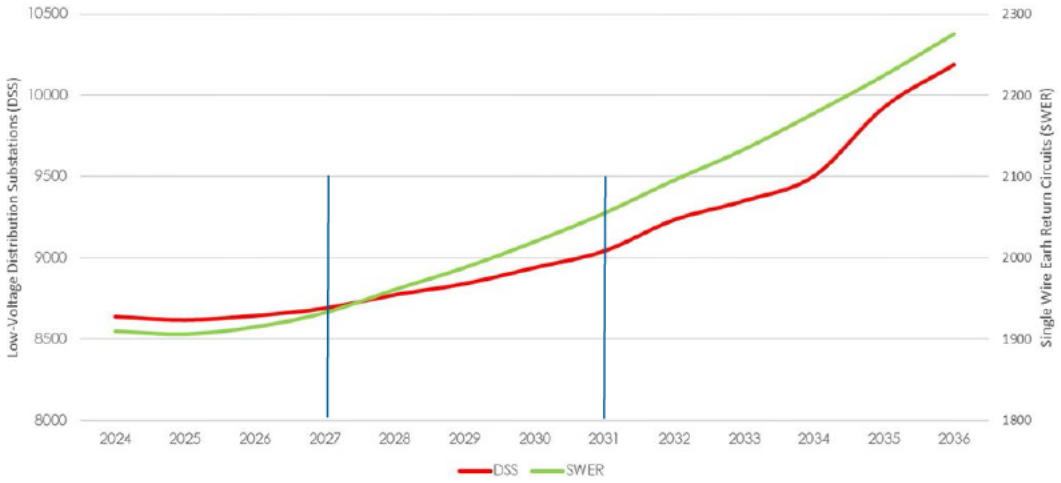
### In its business case analysis, AusNet forecasts extremely high and increasing EUE from thermal overloading of LV network elements

923. According to AusNet's analysis, customers currently experience just over 8,500 MWh per annum load shedding from distribution substation overload (trips) and just over 1,900 MWh unserved energy from SWER line overload (trips) - refer to Figure 5.10.

924. Figure 5.10 also shows AusNet's estimated increasing EUE from electrification-driven demand growth leading to thermal overload of already highly utilised DSS and SWER lines without further investment. Our understanding is that AusNet's assumption is that protective devices such as fuses or DSS failure will lead to load shedding.

925. AusNet values the 'do-nothing' counterfactual EUE risk over the next RCP at $2.35 billion (across the next RCP) using the AER's VCR for commercial, industrial and agricultural sectors and its own QCV for residential customers.

*Figure 5.10: AusNet's forecast EUE due to demand growth from electrification (MWh pa)*




*Source: ASD - AusNet - Demand driven augex (LV augmentation) BC - 31012025 - PUBLIC, Figure 4*

### When we sought to verify the current level of unserved energy due to overload, AusNet's response contradicted the information in its business case by a factor of 1,000

926. The amount of unserved energy in 2024 and 2025 that AusNet presents in its business case, seemed extraordinarily high and not credible to us as a starting point. We therefore asked AusNet to provide historical information to show the extent of load shedding from DSS and/or SWER overloads. Its response included a table which we present as Table 5.6.

*Table 5.6: Total number of LV DSS outages due to overload and unserved energy*

| | 2018 | 2019 | 2020 | 2021 | 2022 | 2023 | 2024 | 2025 |
|---|---|---|---|---|---|---|---|---|
| Number of sites that experienced outages due to overload | 437 | 445 | 300 | 155 | 250 | 140 | 165 | 91 |
| Amount of unserved energy (kWh) | 26,730 | 19,599 | 10,431 | 5,203 | 18,174 | 8,435 | 12,779 | 13,965 |

*Source: AusNet response to IR020 Q91(a)*

927. Our interpretation is that the unserved energy in 2024 and 2025 from overloaded DSS, which is the primary driver of AusNet's proposed program, is 12.8 MWh and 14.0 MWh respectively, which is a fraction of the 8,500 MWh or more shown in Figure 5.10. It also shows a declining trend in substation outages but a recently increasing trend in the energy lost per tripped DSS.

928. AusNet highlights in its response that in the previous and current RCP it has been investing to reduce the number of outages due to overload and has been quite successful in bringing down the number of DSS 'failures', as its data shows.

929. This data undermines the credibility of the information in Figure 5.10 and AusNet's analysis as a whole as the information that AusNet provided in Table 5.6 above is entirely inconsistent with the modelled levels of unserved energy that AusNet has based its proposed LV augmentation program on. The information that AusNet has now provided not only indicates a small level of unserved energy now but also suggests that the impact of electrification that AusNet has relied on for its business case, is significantly overstated.

### Interaction between programs

#### AusNet has proposed a summer and winter readiness program which is designed to proactively address expected overload DSSs

930. Whilst review of this project is not in our scope, it is relevant for us to comment on it in the context of AusNet's proposed LV augex program. The summer and winter readiness program is based on approximately $6 million capex to '*prepare AusNet Services' electricity distribution HV network for the expected peak demand during the summer period from November to March and winter from May to August*'. It assumes approximately 24 DSS, 35 LV feeder circuits, and 8 feeders will require upgrading over the next RCP.[223]

931. We cannot see any cross-referencing in the two business cases. However, if the summer/winter readiness program is designed to address overloaded DSS (and a relatively small number in total), then it is not clear what the LV augmentation program is designed to do to avoid unserved energy from DSS trips on overload.

932. We assume that AusNet has taken into account the increasing demand forecast (driven by electrification) that it refers to in both business cases.

### AusNet's proposed options

#### AusNet considers three options in addition to the 'do nothing' (counterfactual) case to avoid load shedding via tripped (overloaded) DSS and SWER lines

933. Options 1 and 2 are based on investing in solutions to reduce overloading of selected DSS and SWER lines. The solutions are selected if, from AusNet's technical and economic modelling, they generate a positive net present value. Option 1 is based solely on network augmentation solutions and AusNet's preferred Option 2 is based on a combination of network augmentation and 'flexible services.'

934. AusNet mentions battery storage as a potential non-network solution, but it is not identified as an alternative to augmentation or flexible services. We observe that this is a common conclusion reached by DNSPs based on their own research and responses to RIT-D proposals.

935. Option 3 is referred to as 'deterministic augmentation' and is based on eliminating all EUE from DSS and SWER networks. We focus our assessment on Options 1 and 2 because, at a capital cost of $512.2 million ($2024), Option 3 is significantly higher than the estimated capital costs for Option 1 ($148.7m capex, $2024) and Option 2 ($119.5m capex, $2024).

#### Options 1 and 2 include traditional network solutions to alleviate distribution network thermal overloading

936. AusNet's modelling includes several traditional LV distribution and SWER augmentation solutions to address expected thermal overloads.[224] The estimated costs for each solution

223 ASD - AusNet – Summer and winter network readiness BC – 31012025 – CONF, page 2

224 Upgrade DSS and split LV circuits; new DSS with new LV circuits; upgrading SWER lines; rebuild SWER as multi-phase lines

are based on recent historical costs and on this basis appear to be reasonable for the purposes of expenditure forecasting for the next RCP.

### Given the uncertainty about future energy consumption and peak demand, Option 1 is unlikely to be the prudent approach

937. As presented, Options 1 and 2 involve considerable investment in assets with 50-year lives to avoid approximately 63% of EUE from DSS/SWER tripping on overload. However, there is considerable uncertainty about customer behaviours over the next five-seven years in response to increasing energy costs, price signals (dynamic or static), and forecast reducing battery storage and hybrid, PHEV, and EV costs. Investment in network augmentation should be avoided or deferred if at all possible.

938. Given the uncertainty with which households will actually adopt EVs, respond to the opportunities to reduce energy costs by changing their behaviours (via manual or automated energy management), or investing in behind-the-meter storage, flexibility is a prudent means of managing risk if AusNet can demonstrate that the operational cost is reasonable and the benefits are likely to be realisable.

### Option 2 presents some advantage over Option 1 if flexible services are effective

939. Option 1 is said by AusNet to generate the same positive NPV from avoided EUE as Option 2, but by investing solely in network solutions it does not garner Option 2's potential benefit from being able to adjust the extent of flexible services in response to actual overloads. That is, there is the potential to avoid cost if demand growth is less than expected in the overloaded parts of the distribution network over time.

## Proposed opex step change

### The flexible services component of Option 2 is a demand management program

940. AusNet proposes an opex step change of $8.5 million opex ($2026)[225] for flexible services over the course of the next RCP to offset what it states as $29.2 million ($2024)[226] of network augmentation. The opex included for network solutions is similar for both Options 1 and 2.

941. AusNet identifies the following types of flexible services that it appears to countenance as viable for addressing demand-driven DSS and SWER network overloads:[227]

- Supply capacity limiting (SCL)[228]
- Behavioural demand response (BDR), and
- Direct load control (DLC).

942. AusNet assumes that:[229]

- The Flexible services can be provided by third-party contracted virtual power plants (VPP) or by AusNet – the modelling is indifferent
- There will be 35% customer uptake (opting-in), capped at 150kWh per customer[230]

225 Refer to Table 5.2

226 ASD – AusNet – Demand driven augex (LV augmentation) BC – tables 8 and 13

227 ASD - AusNet - Demand driven augex (LV augmentation) BC - 31012025 – PUBLIC, Table 2

228 *Utilises supply capacity limit function of a smart meter to rotationally trip supply of customers when their load exceeds a defined value. Alternatively, the load contactor of a smart meter can be used to trip downstream loads or generators (separate meter) within the customers' premises* (ASD - AusNet - Demand driven augex (LV augmentation) BC - 31012025 – PUBLIC, page 50

229 ASD – AusNet – Demand driven augex (LV augmentation) BC, section 6

230 The on-site presentation refers to 35% customer uptake, whereas the business case refers to the base case of 25% uptake

- Flexible services will eliminate EUE up to 13% overload, applying SCL, BDR, and DLC, and
- It can economically apply flexible services to reduce EUE at 344 DSSs based on a non-network service payment of $4,200 / MWh which is:

> *'based on anticipated rewards customers would expect to get for allowing their devices to be aggregated / for behavioural response.'*[231]

943. We note that AusNet states that '*flexible services [rely] on ability [sic] to generate customer response and control customer generation / load in sufficient numbers to be effective*.'[232]

944. AusNet has made what we consider to be reasonable assumptions regarding the reliability and demand response of the three Flexible services but with a fairly n aggressive customer uptake percentage at 35% overall.

945. AusNet has not countenanced the benefits of a DOE-based demand curtailment program on the grounds that it is primarily a flexible export service, not an import (demand) service and customer impacts have not been tested. Again, we would have expected AusNet to provide the information from peers and/or industry trials to support this claim, which it did not.

### Flexible services can only offset a portion of EUE if overloads are greater than 13%

946. AusNet includes an analysis of the likely effectiveness of its proposed Flexible Services program at DSSs that are overloaded by 40% or more, which indicates only 16.4% of peak demand reduction is assumed for a 40% overloaded DSS rising to 18.7% for a 60% overloaded transformer. This means that at overloading levels which would normally prompt consideration of proactive intervention, Flexible services are least effective and therefore less attractive economically compared to network augmentation. AusNet states that:[233]

> *'To strike a balance between maximising the use of flexible services, versus the potential risk of customers departing from the programs due to onerous demand reduction requirements, we define three scenarios which are set by a minimum economic threshold for delivery of the flexible services.'*[234]

947. The residual EUE (i.e. after applying Flexible services) for these sites will need to be addressed by traditional network solutions under AusNet's model. AusNet's conclusion is that the proposed opex payments for 344 sites[235] will be sufficient to avoid the need for $29.2 million network augmentation.

### AusNet's proposed flexible services payment is not adequately justified

948. AusNet advised[236] that its payment assumption is based on (i) a maximum annual benefit of $2.34 million forecast to be achieved in 2033 from flexible services and (ii) the $0.29 million total cost of establishing and running its DSO platform up to and including 2033.[237] AusNet calculates a maximum annual reliability benefit from running the programs from the Flexible Services platform, which it derives by considering a VCR of $35,000/MWh applied to 'curtailed loads.' From this, AusNet derives a proposed payment to customers allowing their devices to be aggregated[238] by taking the establishment cost as a proportion of the 2033

231 ASD - AusNet - Demand driven augex (LV augmentation) BC - 31012025 – PUBLIC, page 21

232 ASD - AusNet - Demand driven augex (LV augmentation) BC - 31012025 – PUBLIC, page 11

233 ASD - AusNet - Demand driven augex (LV augmentation) BC - 31012025 – PUBLIC, page 20

234 Based on a maximum demand response delivered per participating customer which corresponds to the substation annual EUE limit of 2.0MWh per annum identified above an overloading limit of 60%, limiting the total number of sites for the high scenario to approximately 538 sites.

235 ASD - AusNet - Demand driven augex (LV augmentation) BC - 31012025 – PUBLIC, table 11

236 AusNet response to IR009, question 29C(iii)

237 Addressed in a separate business case and assessed in section 5.6

238 Switched off or down at times when there is value to the network

benefit and multiplying it by the VCR. From this, it derives a proposed payment of $4,200/MWh, as shown below:

*($0.29÷$2.34)x$35,000/MWh = $4,200/MWh.*

949. This calculation is not compelling. AusNet has not provided sufficient information to suggest that (i) a payment is necessary, and (ii) that the quantum of the proposed payment is appropriate - we expected AusNet to have drawn on the results of its own trials, other industry programs, VPP feedback, and surveys of its customers to arrive at a more robustly determined payment forecast. We are unaware of other payment schemes associated with anything other than to encourage participation in trials.

950. Based on the information provided, we do not consider AusNet has provided sufficient justification for the customer payment on an ongoing basis to support customer participation in its flexible service scheme.

#### It is reasonable to include Flexible Services in improving reliability at sites where it is likely to be cost effective

951. Despite our reservations regarding the cost and the realisable benefits from Flexible services as AusNet has presented them, given (i) the sunk cost in enabling the Emergency backstop functionality, and (ii) the AEMC requirement for AusNet to provide 'export services' from 1 July 2026, it seems reasonable for AusNet to include flexible services as an option.

### Proposed proactive investment in LV augex

#### AusNet's economic analysis relies on its 'VCR methodology' to identified import limitations (thermal overloading)

952. As discussed above, AusNet utilises the VCR for commercial, industrial and agricultural sectors, and its own QCV value for the residential sector to assess the value EUE:

> *'…in the form of customer load-shedding that may be needed to address thermal overload and voltage limitations as a result of forward power flow breaching import ratings. The assessment approach in this business case applies VCR to the importing of load that causes maximum net demand to increase to levels that exceed the import rating of each network asset under assessment.'*[239]

953. We have no fundamental issue with AusNet's application of VCR and QCV as described, however the values that are applied by AusNet are subject to review by the AER.

#### AusNet's economic analysis relies on the assumed EUE starting point for the DSS and SWER overloads which we cannot reconcile with recent actual EUE

954. We sought to understand the basis for AusNet's economic analysis given the apparent disparity between the EUE shown in Figure 5.4 and Table 5.5.

955. Taking into account AusNet's response to our information request[240] we were unable to reconcile the difference. On this basis we do not consider that the economic benefits derived are robust enough to support the reliability improvement program proposed.

## 5.4.4 Findings

956. We consider that AusNet's proposed proactive LV augmentation expenditure program to address the effects of electrification, is not adequately justified.

239 ASD - AusNet - Demand driven augex (LV augmentation) BC – 31012025, page 12

240 AusNet response to IR020 Q91(a)

#### AusNet's proposed opex step change to allow it to make flexible services payments to customers, is not justified

957. Whilst the strategy of using Flexible services to offset the need for LV augmentation to avoid demand-driven DSS and SWER overloads is sound in principle, AusNet has not justified the need that it assumes to make payments to customers in order for them to adopt flexible services. AusNet is separately proposing a DSO and will have the ability to offer flexible load services as an alternative to putting static limits on major new electrification loads, mainly residential EV charging, similar to the basis on which flexible exports are being offered to customers with PV.

#### AusNet's proposed electrification-driven LV augex investment is not justified

958. AusNet proposes to undertake a proactive investment in augex on the basis that this is a prudent proactive approach to address the forecast impact of electrification. AusNet relies on its economic analysis that it claims to demonstrate that such an approach has a positive net economic benefit.

959. We consider that two crucial elements of AusNet's assessment undermine its credibility:

- AusNet has not demonstrated that undervoltage supply results in an economic cost to consumers that is valued at VCR; moreover, we consider that this is unlikely to be the case and that to do so is a significant overestimate of the economic cost, and
- AusNet has not demonstrated a relationship between instances of thermal overload and unserved energy that either currently, or forecast terms, would lead to unserved energy to the levels that it has assumed in its economic modelling.

960. We consider that AusNet has significantly overstated the claimed economic benefits of its proposed investment and from our review of the assumptions and modelling methods that AusNet has used, we consider that its case for undertaking this investment is not justified.

## 5.5 AusNet's Priority 3 program: CER Enablement

961. As shown in Table 5.2, AusNet has proposed $40.4m for CER Enablement, as the 'third priority' proactive element of its CER and electrification program.

962. Review of this program is not within the scope that AER defined for us. However, as is shown in Figure 5.2, AusNet has defined and sought to justify the proposed CER enablement program from the same suite of technical and economic models as the priority 1 and 2 programs that we have reviewed above. To the extent that they are relevant to AusNet's modelling of all three programs, issues that we have identified with the two programs that we have reviewed may also apply to its proposed CER enablement program.

## 5.6 DSO / Future service provider ICT hub

### 5.6.1 What AusNet has proposed

#### Objectives and claimed benefits

963. AusNet has proposed a single ICT project for CER, which it refers to as the DSO Hub. In effect this is an 'omnibus' project that is intended to provide a range of CER-related functionality, as we describe below.

964. AusNet describes the objectives and benefits of the project in its business case, and we reproduce these in Figure 5.11.

*Figure 5.11: AusNet's description of the objectives and benefits of its proposed DSO Hub project*

**Key objectives of the program**

- *Introduce flexibility in network management of customers' solar exports to increase network utilisation, reduce network costs and improve customer outcomes*
- *Introduce flexibility in connections of flexible commercial load, to increase network utilisation, reduce network costs and deliver optionality to customers*
- *Provide more customers and third parties an opportunity to participate in nonnetwork solutions, providing direct rewards to customers/third parties while deferring network augmentation*
- *Enable customers, community groups and third parties to access network information that helps them plan and deliver their energy projects*
- *Integrate systems with Australian Energy Market Operator's (AEMO) Consumer Energy Resources (CER) Data Exchange, to improve data sharing and connectivity of aggregated CER on the network*

**Key benefits**

- *Increased network utilisation and deferred augmentation, reducing long term network cost for all AusNet customers*
- *Optionality for customers when connecting to the network (both load and embedded generation)*
- *Lower cost of connection for flexible loads*
- *Faster connections of energy projects through better informed decision making on where and how to connect to the network*
- *Lower cost of aggregation of CER and participation in non-network solutions, to the benefit of all AusNet customers and electricity consumers in the National Electricity Market (NEM)*

*Source: AusNet EDPR Business Case for DSO, page 3*

### Proposed expenditure

965. AusNet proposes the forecast capex and forecast opex step changes shown in Table 5.7, totalling $43.9m.

*Table 5.7: AusNet's proposed expenditure for CER – DSO Hub ICT - $m, real 2026*

| | FY27 | FY28 | FY29 | FY30 | FY31 | Total |
|---|---|---|---|---|---|---|
| Capex | 11.5 | 11.5 | 4.4 | 10.0 | 3.4 | 40.8 |
| Opex step change | - | 0.8 | 0.8 | 0.8 | 0.8 | 3.2 |
| **TOTAL** | **11.5** | **12.3** | **5.2** | **10.8** | **4.2** | **43.9** |

*Source: ASD EDPR 2026-31 – SCS Capex Model – 310125 and EMCa derived from AusNet model: ASD – AusNet – Accumulated Workbook for Opex and Step Changes – 31 Jan 2025*

### Summary of AusNet's main supporting information

966. AusNet proposes seven initiatives that are designed to provide the functionality that it considers to be necessary. In Table 5.8, we present AusNet's capex costing of these seven

initiatives, together with the two opex line items that comprise its proposed CER opex step change.[241]

*Table 5.8: AusNet's defined initiatives and forecast capex and opex for DSO Hub project - $m, real 2024*

| Initiatives / line items | FY27 | FY28 | FY29 | FY30 | FY31 | Total |
|---|---|---|---|---|---|---|
| **Capex** | | | | | | |
| DER Optimisation/Integration | - | - | - | 5.00 | - | **5.00** |
| DERMS - CER Gen/Load Management | 2.50 | 2.50 | - | - | - | **5.00** |
| Flexible Exports Full Roll Out | 5.00 | - | - | - | - | **5.00** |
| Network Data Sharing | 2.00 | 1.00 | - | - | - | **3.00** |
| CER Open Data Exchange Integration | - | 3.00 | 1.00 | 1.00 | - | **5.00** |
| Flexible Demand Orchestration (C&I) | - | 3.00 | 1.00 | 1.00 | - | **5.00** |
| Flexibility Services Integration | 1.00 | 1.00 | 2.00 | 2.00 | 3.00 | **9.00** |
| **Total capex** | **10.50** | **10.50** | **4.00** | **9.00** | **3.00** | **37.00** |
| **Opex** | | | | | | |
| Flexible Demand Orchestration (C&I) | - | 0.75 | 0.75 | 0.75 | 0.75 | **3.00** |
| DERMS Licence and Support Expansion | - | - | 1.61 | 3.16 | 3.31 | **8.08** |
| **Total opex** | **-** | **0.75** | **2.36** | **3.91** | **4.06** | **11.08** |

*Source: AusNet EDPR 2027-31 Digital Program NPV Model*

967. In information provided in response to our information request, AusNet confirms that the proposed DSO is (as we would expect) allocated 100% to its SCS distribution service.[242]

968. In AusNet's business case, there was no information that would assist in understanding the nature of the seven line-items / initiatives listed and costed in AusNet's NPV model. We sought further information on this through an IR, and AusNet responded mapping these 'line items' to 'capability categories, as shown in Table 5.9.[243]

241 Note that the cost estimates in this table are in $2024, which is as provided by AusNet in its NPV model

242 AusNet response to IR20, Q43

243 AusNet response to IR20, Q99

*Table 5.9: AusNet's clarification of the functionality for each 'initiative'*

| Costed line item | Capability category |
|---|---|
| • DER Optimisation/Integration<br>• DERMS – CER Gen/Load Management<br>• Flexible Exports Full Roll Out | ***DER optimisation/integration algorithms for efficient network capacity allocation***—*ensuring that Flexible Exports, dynamic connection agreements and flexible services are sufficiently sophisticated to deliver genuine efficiencies and improved network utilisation* |
| • Network Data Sharing<br>• CER Open Data Exchange Integration | ***Effective network data sharing platforms***—*ensuring community energy groups and other third parties are able to effectively search and access current network visibility data that assist in their energy project development, including finding the most efficient point of connection to the networks* |
| • Flexible Demand Orchestration (C&I) | ***Communications and control capabilities with new load devices on our network***—*allowing us to communicate with commercial load devices in real time and provide network instructions and controls specific to each device* |
| • Flexibility Services | ***Simple to use and effective non-network solutions trading platform***—*simplifying sharing of network constraints and ability for customers and third parties to provide flexible services in near real time, including simplified terms and conditions and pricing.* |

*Source: AusNet response to IR20, Q99*

## 5.6.2 Assessment

### AusNet's economic assessment is implausible and cannot be relied on

969. In its business case, AusNet presents this project as having an NPV of $4.8m. While its calculation of this amount is supported by its NPV model, we consider the inputs to this model to be highly questionable.

970. In its NPV model, AusNet presents three benefits, with associated values that we present in Table 5.10.

*Table 5.10: AusNet's forecast benefits from its proposed DSO project - $m, real 2024*

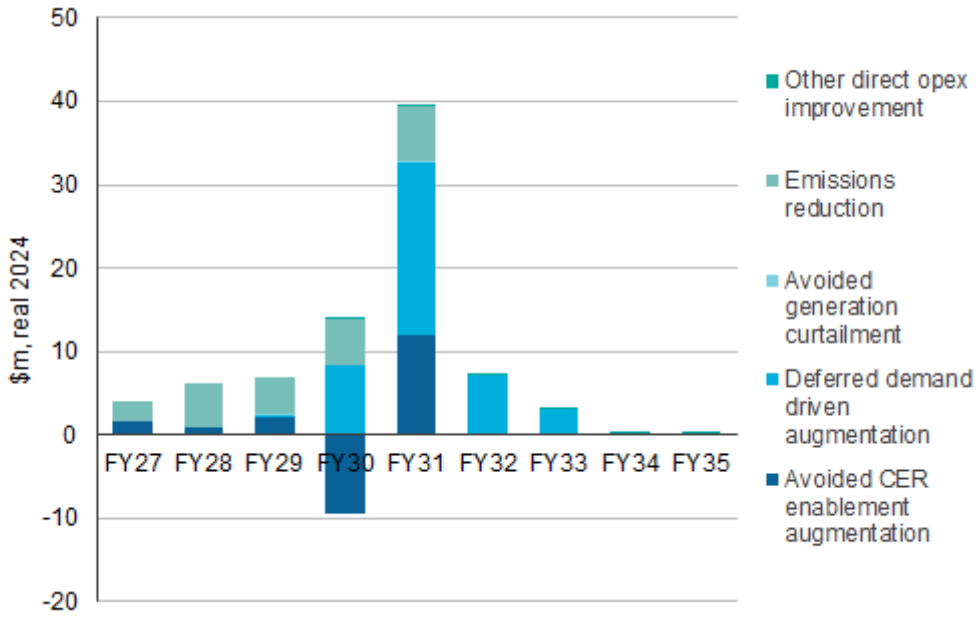
| | FY27 | FY28 | FY29 | FY30 | FY31 |
|---|---|---|---|---|---|
| Deferred augmentation | 1.6 | 0.8 | 2.3 | -1.3 | 32.7 |
| Customer value of outages | 2.5 | 5.3 | 4.5 | 5.6 | 6.8 |
| Other direct opex improvement | - | - | - | 0.0 | 0.1 |
| **Total benefits** | **4.1** | **6.1** | **6.8** | **4.3** | **39.5** |

*Source: EMCa, from AusNet NPV model for ICT, sheet 'DSO.NPV'*

971. We were surprised to observe that these benefits are for the most part specified at only two significant figures, since typically this information comes from highly granular modelling of the impact on customers over 30-minute intervals. Although not evident from the table above, AusNet's forecast also showed benefits falling rapidly after 2031, to almost nothing by 2034. This is contrary to any other such analysis that we have reviewed as typically benefits ramp up and are assumed to continue. For example, CitiPower, Powercor and United Energy have each modelled benefits from flexible services to 2040, while Jemena has proposed that they will continue to increase to 2050.

972. We sought further information to understand how AusNet had estimated these benefits. In its response, AusNet provided a disaggregation now to five line-items and we have graphed these in Figure 5.12.

*Figure 5.12: AusNet's forecast of benefits from proposed DSO Hub ICT project - $m, real 2024*




*Source: EMCa, from AusNet response to IR20, Q102*

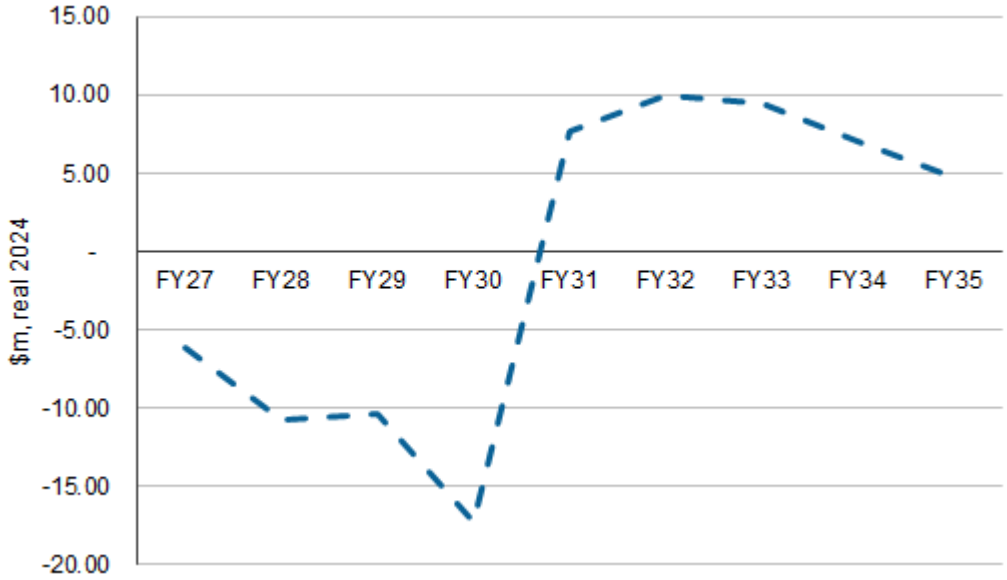
973. This information provides little further insight. AusNet describes the benefit values as arising from its modelling, including its modelling of LV augmentation and avoided generation curtailment. However, there are a number of aspects of this that are counter intuitive. For example:

- Even with more detail, the input values are hard coded and rounded values that give the appearance of 'entered' data rather than data derived directly from such models
- Augmentation deferral appears to have been calculated on the basis that 'deferred' augmentation is completely avoided, rather than being deferred (i.e. to some later time). It is unclear whether this is a valid assumption
- Avoided CER enablement augmentation ceases from 2031, and demand-driven augmentation ceases from 2033. We infer that this is likely because AusNet's modelling has not been continued after these dates, rather than because there would not be any longer-term benefit, and
- AusNet models a benefit from avoided generation curtailment of only $0.1m in FY27 (and rising to $0.3m by FY31) yet attributes a value of $2.4m to emissions reduction from such curtailment. In other such analyses, the value of avoided curtailment (valued at CECV) and emissions reduction (valued at the AER's VER) are approximately equivalent. It seems highly likely that one of these values is incorrect by at least a power of 10. Moreover, AusNet models no further such benefits after 2031.[244]

974. In Figure 5.13 we show the cumulative 'earning' of the eventual NPV of $4.8m, that AusNet derives. This shows what we consider to be a highly implausible trend in which the proposed investment would have a positive NPV as soon 2031, but with ongoing costs from that time not offset by any material further benefits.

[244] AusNet's values for VER benefits are hard coded, therefore we are unable to confirm whether they are in accordance with AER's guideline.

*Figure 5.13: EMCa assessment of the cumulative discounted net benefit of DSO - $m, real 2024*




*Source: EMCa, with cumulative net benefit derived from 'discounted impact' row in AusNet's NPV analysis for DSO*

975. We conclude that AusNet's economic assessment cannot be relied on as an indicator of the economic value of the DSO project.

### AusNet's options analysis is not meaningful

976. In our report on AusNet's non-CER ICT projects, we identify a range of concerns which apply across most of its proposed ICT projects.

977. One of these is that its options analysis tends to provide no meaningful insight as to whether the proposed option is appropriate.

978. Similar to other ICT projects, AusNet identifies three options in its business case:

- Option 1: Do nothing
- Option 2: Maximise use of existing systems with required enhancements (preferred), and
- Option 3: Maintain existing systems, augment with new task-specific applications.

979. As is typically the case, 'doing nothing' in the face of the unavoidable impact of the energy transition, is not a genuine option.

980. For other reasons, it is intuitive that it is likely to be less costly, lower risk and provide a more effective outcome to 'maximise the use of existing systems' (Option 2) than to develop a range of new bespoke systems (Option 3).

981. The missing aspect of option consideration is any apparent consideration of the scope of what is proposed, and we consider this further below.

### AusNet has not justified the proposed scope

982. Referring to the information that AusNet provided as shown in Table 5.9, we see no evidence that AusNet considered the extent to which each of the elements of functionality referred to in this table will contribute benefits. We sought further information through an information request, and we refer to AusNet's response below.[245] AusNet provided information that did seek to link quantified benefits to groupings of functionality, and which we refer to below.

[245] AusNet response to IR20, Q102. In this response, AusNet provided

983. We would expect that Flexible Exports will contribute to benefits. From the information that AusNet provided in response to our information request, this appears to be the case, and AusNet ascribes a benefit of $24.7m of avoided customer curtailment and $6.9m of deferred augmentation to what it presents as a $16m cost.[246]

984. In its benefits assessment, AusNet refers to deferred demand driven augmentation; however, in its DSO business case the reference to demand orchestration is described as being for C&I customers. It is unclear, therefore, whether AusNet's DSO is intended to provide a more general Flexible Import service (i.e. to residential customers) and, if so, where it is costed and whether the benefits assume this. AusNet ascribes a benefit of $29m to this, against a cost of $23m.

985. In Table 5.9, AusNet refers to the DSO providing a non-network marketplace. From Table 5.8, we see that this contributes $9m of the $37m (in $2024) proposed capex for the DSO. AusNet provides minimal information beyond the description to justify this. For example, we would expect an assessment that demonstrates to a reasonable standard the effectiveness of such a marketplace, with evidence including the extent of non-network solutions, take up rates to date, the extent to which such take-up might be facilitated by such a marketplace and the extent to which this initiative in itself would contribute sufficient benefit to justify the proposed investment.

986. The benefits of network data sharing are similarly not evidenced, for example, by information on the volume and nature of data requests, information describing what is proposed, how it would be managed, and how the availability of whatever data is being considered, will contribute benefits that are relevant under the NER criteria. In its response to our IR, AusNet acknowledges that it has not quantified the benefits of this proposed initiative.

987. In a response to our IR,[247] AusNet refers to the 'open data exchange' as being an *'…anticipated compliance requirement'* and that it has assessed its cost at approximately one-third of the IDX component of the MITE project. We consider that it is not within the NER criteria to allow for such a project on the basis that it may be a compliance requirement, and the other four Victorian DNSPs do not appear to have assumed this.

988. Absent information that might validate the scope of the initiatives that AusNet has listed, we consider that AusNet's DSO as proposed is over-scoped. On an experience basis, we consider it likely that a well-conceived Flexible Export capability, introduced at a cost and time consistent with AusNet's proposal, is likely to be justified. Conversely, we consider it unlikely that a non-network marketplace initiative would be justified, at the cost of $9.0m ($2024) that AusNet has proposed. The justification for the remainder of AusNet's proposed DSO Hub functionality is unclear from AusNet's proposal.

### Costing is likely to be overstated

989. In our assessment of AusNet's overall ICT proposal, we describe the reasons why we consider that AusNet's proposed capex for ICT projects tends to be overestimated. We asked AusNet to describe the maturity of its DSO costing, and it responded advising that it considered each of the seven initiatives to be 'medium' maturity.

990. For the reasons stated in our ICT review, we consider that there is likely to be an element of overestimation in AusNet's proposed DSO hub costings for each initiative. However, we consider that this is a minor factor, relative to the impact of matters relating to scope and project economics that we raise above.

### Opex step change

991. AusNet has proposed an opex step change of $3.2m (as shown in Table 5.7). As is evident by comparing this table with information in Table 5.8, this is for assumed licencing costs for 'flexible demand orchestration'. In its business case, AusNet describes this cost as being for 'licencing and support'. Since this is for new functionality that would not have been in the

246 AusNet groups together DER optimisation, DEMS – CER Gen/load management and Flexible Exports full roll out

247 AusNet response to IR20, Q99(c)(i) and ZIR20 Q100(a)

'base year', we consider that this represents a reasonable estimate of additional opex for this purpose.[248]

992. In its NPV model, AusNet also includes the cost of ongoing licencing for DERMS Emergency Backstop, after the current up-front licence payment expires at the end of calendar year 2028. For reasons that AusNet explains in its information response, this is presented as an opex step change for its Emergency backstop mechanism and is not included in AusNet's proposed CER opex step changes.

### 5.6.3 Findings

993. We consider that AusNet has not justified the $40.8m capex that it proposes for a DSO hub. We consider that its proposed capex is significantly overstated, mainly because it has not justified the inclusion of a number of initiatives which together contribute a significant proportion of the proposed amount.

994. We consider that AusNet's proposed DSO opex step change totalling $3.2m over the period, is a reasonable estimate of its additional costs.

## 5.7 Findings and implications on proposed CER-related programs

### 5.7.1 Findings

#### General

995. We have been asked to review specific CER programs, and which include 'electrification' programs. Our scope comprises those programs that through the course of this review we have identified as follows (along with AusNet's advised prioritisation):

- Priority 1: Voltage compliance program which comprises a proposed proactive Steady State Voltage Compliance program and a reactive Supply Improvement program
- Priority 2: LV augex work identified under the LV Augex (Electrification and Flexible Services) program and which comprises a proposed proactive augex program and an opex step change for proposed payments to customers to adopt Flexible Services
- A DSO Hub ICT project, with an associated ICT opex step change.

996. We have not been asked to review AusNet's proposed expenditure for CER enablement.

997. Of the proposed total expenditure of $266.7m, $254.9m is for capex, with $214.1m being augex (CER) and the remainder for ICT.

#### Voltage compliance augex

998. We consider that it is reasonable for AusNet to consider whether it might be prudent to undertake some proactive investment as a counter to reactively responding to compliance issues. However, AusNet has not justified the proactive 'Steady State Voltage' program that it has proposed. We reach this view on the basis that AusNet has not justified, and in our view has significantly overstated, the economic benefits by which it seeks to justify this program.

999. We are satisfied that it is likely that network expenditure at discrete locations will be required over the duration of the next RCP to respond to customer power quality complaints that arise despite the impact of the proposed DVM system. For this purpose, we consider AusNet's proposed supply improvement program is reasonable, though its proposed expenditure is overstated.

248 AusNet response to IR20, Q101a

#### LV Augex (Electrification and flexible services)

1000. AusNet has not justified the proactive program of large-scale network augmentation that it has proposed to address the claimed impacts of electrification because it has not justified, and in our view has significantly overstated, the economic benefits by which it seeks to justify this program. We consider that in its business case and associated economic modelling AusNet has overstated both the impact (in terms of unnerved energy) and the economic value of any impact.

1001. We also conclude that AusNet has not justified the opex step change that it proposes for payments that it considers it will need to make in order to facilitate adoption of flexible services.

#### DSO / Future service provider hub

1002. While we consider that it is justified to develop ICT capability to offer a full rollout of flexible exports, as AusNet proposes to do from 2027, we consider that AusNet's proposed DSO hub includes significant and costly functionality that AusNet has not justified. Because of this, we consider that its proposed ICT capex of $40.8m for a DSO Hub is significantly overstated and is not justified by AusNet's claimed economic analysis.

1003. AusNet's proposed opex step change for its DSO hub is a reasonable estimate of additional opex for this purpose.

### 5.7.2 Implications for proposed capex allowance

1004. Within this section, we have reviewed the following:

- Proposed CER-related augex programs with an aggregate value of $173.7m
- A proposed CER-related ICT program (DSO Hub) with proposed capex of $40.8m, and
- Two proposed opex step changes, being
  - An ICT opex step change of $3.2m associated with the DSO Hub
  - An opex step change of $8.5m for proposed Flexible Services payments to customers

#### Alternative forecast methodology

1005. Our proposed alternative forecast for these categories involves one or more of the following adjustments, to the extent that it formed the basis of AusNet's forecast and which we consider to be not justified or overstated:

- Adjustments to correct modelling issues and/or to take account of unsupported or incorrect model input assumptions and including where we consider that such issues invalidate justification for a proposed program
- Adjustment to account for unsupported elements of scope of proposed programs
- Adjustment for risk allowance and/or management reserve provisions, and
- Adjustment to align the forecast with historical spend, where an ongoing level of expenditure represents a reasonable default assumption and where the proposed increase was not otherwise justified.

#### Alternative forecast of expenditure

1006. We consider that a reasonable alternative forecast for AusNet for the projects that we have reviewed are as follows:

- A reasonable alternative forecast for the $173.7m of CER-related augex that we have reviewed, would be of the order of 5% of the amount that AusNet has proposed. This would essentially align its voltage and LV load management augex with its allowance in the current period.

- A reasonable alternative forecast for the $40.8m ICT capex for the proposed DSO hub, would be 30% to 40% less than AusNet has proposed.
- AusNet's proposed ICT opex of $3.2m for the DSO hub is a reasonable estimate of additional opex required for this function.
- AusNet's proposed Flexible Services and Non-network opex step change of $8.5m, is not justified.

# 6 REVIEW OF PROPOSED OPEX STEP CHANGES FOR POLE INSPECTION, HAZARD TREE PROGRAM AND EARLY FAULT DETECTION

AusNet has proposed eleven (nine positive and two negative) step changes totalling $131.7 million for the next RCP. In this section, we consider three of the eleven opex step changes proposed by AusNet Services for pole inspection, hazard tree reduction and early fault detection.

We consider that AusNet is subject to a change of regulatory obligation for pole inspection, and that this change has resulted in a change of expenditure requirements relative to its base year opex. The proposed opex after adjustment by AusNet is reflective of an efficient additional cost.

For the hazard tree program, we consider AusNet's proposal does not satisfy the relevant NER criteria for an opex step change.

For the early fault detection, we consider the proposed opex step change as a part of the capex project to which it relates in section 4 of this report. For reasons that we describe in that section, we consider that this step change is not justified.

## 6.1 Introduction

1007. In this section, we describe AusNet's rationale for three technical-related opex step changes that we have been asked to review and assess them in the context of the requirements of the NER requirements.

### AER guidance materials

1008. As outlined in the AER's Better Resets Handbook, the AER assesses the efficiency of a business's proposed opex forecast at a total level, using the top-down 'base-step-trend' approach described in the AER's Expenditure assessment guideline.

1009. In the Better Resets Handbook, the forecasting of the step change component of the base-step-trend approach is described as follows:

> *'Forecasting step changes in costs that are not compensated by base operating expenditure and trend, and are required to ensure the operating expenditure forecast meets the criteria in the Rules. Examples include cost increases associated with new regulatory obligations and trade-offs between capital expenditure and operating expenditure.'*[249]

1010. The AER has set out its expectations for forecasting step changes, in that they are limited to a few in number, or none at all. Our understanding is that step change should present material additional efficient costs to the business that are not provided for in the base or trend component of the opex forecast:

[249] AER Better Resets Handbook July 2024, page 23

*'New regulatory obligation step change*

- It is clearly linked to the new regulatory obligation and represents a major upward step to comply with it.
- It will have an impact on the costs of providing prescribed network services and it can be demonstrated that it is not capable of being managed otherwise under forecast opex through in-built provisions under output, price and productivity growth.
- No double counting of costs.

*Capex/opex substitution step change*

- It is supported by thorough cost-benefit analysis.
- The avoided capex is estimated accurately and it more than offsets the increase in opex in net present value terms (that is, efficient substitution).
- No double counting of costs.

*Step change driven by major external factor(s) outside the control of a business*

- It will have an impact on the costs of providing prescribed network services and it can be demonstrated that it is not capable of being managed otherwise under forecast opex, including through inbuilt provisions under output, price and productivity growth.
- Where it involves incurring costs in complex areas or markets, it is accompanied by an expert report (including analysis of options, market outlook and opinion on the reasonableness of the proposed step change).
- No double counting of costs.'[250]

1011. The AER expenditure assessment guidelines outline the approach for assessment of step changes.[251] We consider the AER guidance in our assessment of the proposed opex step changes.

### Consideration of materiality

1012. To our knowledge the AER has not established a materiality threshold for opex step changes, other than the principle that it will have an impact on the business' ability to deliver network services, and it can be demonstrated that it is not capable of being managed otherwise under forecast opex, including through inbuilt provisions under output, price and productivity growth.

1013. These provisions reflect the different circumstances, and operating environments of each of the businesses. The AER has also provided guidance that step changes should not double count the cost of increased regulatory burden over time, which forecast productivity growth may already account for. Also, that:

> *'We will consider what might constitute a compensable step change at resets, but our starting position is that only exceptional events are likely to require explicit compensation as step changes. Similarly, forecast productivity growth may also account for the cost increases associated with good industry practice.'*[252]

1014. In our assessment of the specific opex step changes that AER has asked us to review, we have not considered matters of materiality which, in any case, would be better dealt with at the aggregate level. We therefore consider only whether the proposed expenditure is required on technical grounds and whether it is incremental to expenditure currently incurred.

250 AER Better Resets Handbook, July 2024, page 26

251 AER Expenditure assessment guidelines – Electricity Distribution, October 2024, page 9-10

252 AER Expenditure assessment guidelines – Electricity Distribution, October 2024, page 24

## 6.2 What AusNet has proposed

### 6.2.1 AusNet's proposed expenditure

1015. AusNet has nominated the 2022- 23 regulatory year as the base year for forecasting opex, with the adjusted base year expenditure set at $286.0 million.[253]

1016. For the next RCP, AusNet has proposed eleven (nine positive and two negative) step changes totalling $131.7 million as shown in Table 6.1.

*Table 6.1: AusNet proposed opex step changes - $m, real FY2026*

| Opex step changes | 2026-27 | 2027-28 | 2028-29 | 2029-30 | 2030-31 | Total |
|---|---|---|---|---|---|---|
| Flexible services and non-network solutions | 0.5 | 1.1 | 1.7 | 2.3 | 2.9 | **8.5** |
| More frequent pole inspections | 1.6 | 1.6 | 1.6 | 1.6 | 1.6 | **8.0** |
| Fleet Electrification | 0.0 | -0.1 | -0.1 | -0.2 | -0.2 | **-0.7** |
| Digital (SaaS, Licenses, etc.) | 3.6 | 7.4 | 8.7 | 10.0 | 10.2 | **39.9** |
| Early fault detection | 1.6 | 1.6 | 1.6 | 1.6 | 1.6 | **7.8** |
| Digital Efficiencies | -0.8 | -0.8 | -0.8 | -0.8 | -0.8 | **-3.9** |
| Preparedness and Response | 1.8 | 1.9 | 1.8 | 1.8 | 1.8 | **9.2** |
| Hazard tree program | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | **15.0** |
| CRM broad communications | 3.3 | 3.1 | 3.1 | 3.1 | 3.1 | **15.7** |
| Emergency Backstop Mechanism | 3.3 | 3.3 | 4.3 | 5.4 | 5.5 | **21.6** |
| Insurance | 1.8 | 2.0 | 2.1 | 2.2 | 2.4 | **10.5** |
| **Total** | **19.6** | **24.0** | **27.0** | **30.1** | **31.0** | **131.7** |

*Source: EMCa table derived from AusNet EDRP 2026-31 – Opex Model*

1017. AusNet has also grouped its proposed step changes across five drivers as shown in Table 6.2.

[253] Based on SCS opex model

*Table 6.2: AusNet proposed opex step changes by driver - $m, real FY2026*

| Driver | Step Changes | Amount ($m) |
|---|---|---|
| Capex-opex trade-off and opex tied to efficient capex ($44m) | Digital (SaaS, licenses etc.) | 40 |
| | Flexible services and non-network solutions | 9 |
| | Fleet electrification | -1 |
| | Digital Efficiencies | -4 |
| Resilience and safety ($32m) | Preparedness and response to emergencies | 9 |
| | **Hazard trees** | **15** |
| | **Early Fault Detection** | **8** |
| Regulatory Change ($30m) | Emergency Backstop Mechanism | 22 |
| | **Pole inspection frequency** | **8** |
| Service uplift (customer supported) ($15m) | Customer relationship management and energy solutions support and broad communications | 15 |
| Market change ($11m) | Insurance | 11 |

*Source: EMCa table derived from AusNet onsite presentation slides Day 1, slide 18*

### 6.2.2 EMCa's scope of review for proposed opex step changes

1018. The scope of our review of proposed technical-related opex step changes included in this section is outlined in Table 6.3.

*Table 6.3: EMCa's scope of AusNet proposed opex step changes - $m, real FY2026*

| Step change | 2026-27 | 2027-28 | 2028-29 | 2029-30 | 2030-31 | Total |
|---|---|---|---|---|---|---|
| More frequent pole inspections | 1.6 | 1.6 | 1.6 | 1.6 | 1.6 | **8.0** |
| Hazard tree program | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | **15.0** |
| Early fault detection | 1.6 | 1.6 | 1.6 | 1.6 | 1.6 | **7.8** |
| **Total** | **6.2** | **6.2** | **6.2** | **6.2** | **6.2** | **30.9** |

*Source: EMCa table derived from AusNet EDRP 2026-31 – Opex Model*

1019. We considered opex step changes associated with AusNet's proposed CER program in section 5 and we consider opex step changes associated with AusNet's proposed Digital program (ICT and cyber) in separate reports to the AER.

## 6.3 Assessment

### 6.3.1 More frequent pole inspections

#### What AusNet has proposed

1020. AusNet has proposed an opex step change for more frequent pole inspections at a cost of $8.0 million for the next RCP as shown in Table 6.3. AusNet submits that the proposed opex step change meets the criteria of a changed regulatory obligation, arising from an ESV direction to conduct more frequent pole inspections.

1021. In support of the proposed opex step change, AusNet has provided a description of the proposed opex step change in its regulatory proposal[254] and attached a copy of ESV's request to submit a revised bushfire management plan.[255]

### Updated proposal by AusNet

1022. During our onsite meeting, AusNet submitted a revised resource plan which had the result of reducing the proposed pole inspection step change costs to $6.2 million, being $1.8 million lower than its initial proposal. We understand this change has been made because the additional uplift in resourcing was in response to matters un-related to the ESV direction. In response to our information request, AusNet provided an 'adjusted' forecast based on its build-up of labour and contract costs – effectively scaling the labour component to reflect the reduced resourcing and making a similar reduction to vehicle costs. These changes reduce the estimated opex from $1.46 million to $1.13 million pa ($2023). The change was documented in response to our information request.[256]

1023. We calculate the 'adjusted' step change as shown in Table 6.4.

*Table 6.4: AusNet amended proposal for pole inspection step change - $m, real FY2026*

| Step change | 2026-27 | 2027-28 | 2028-29 | 2029-30 | 2030-31 | Total |
|---|---|---|---|---|---|---|
| More frequent pole inspections | 1.2 | 1.2 | 1.2 | 1.2 | 1.2 | **6.2** |

*Source: EMCa table derived from ASD – ESV pole inspection - CONF*

### Assessment

#### ESV direction is binding on AusNet Services

1024. AusNet, like other Victorian DNSPs which are also referred to as a major electricity companies (MEC), is subject to the requirements of the Energy Safety Act including a general duty as set out in s98 of the Act, to design, construct, operate, maintain and decommission its supply network to minimise as far as practicable.

1025. ESV's investigation into wood pole management at AusNet identified that AusNet had, in 2020, lengthened its inspection interval for network assets in hazardous bushfire risk areas from 30 months to 36 months,[257] requiring that AusNet explain how this change had met its general duties:

> *'The Wood Pole Report made relevant findings and recommendations that:*
>
> *(a) the Supplier had recently introduced changes to its wood pole management approach that it had not thoroughly and adequately assessed;*
>
> *(b) the changes had also not demonstrated long-term sustainable safety outcomes or that they minimised risk as far as practicable; and*
>
> *(c) the Supplier was to demonstrate to ESV by 25 February 2022 how its current asset inspection approach to pole management, and frequency of pole inspection in hazardous bushfire risk areas in relation to poles and all pole top asset classes impacted by this change met the general duties imposed on the Supplier pursuant to section 98 of the Act, including the application of the Supplier's ESMS.4 the Supplier was to demonstrate to ESV by 25 February 2022 how its current asset inspection approach to pole management, and frequency of pole inspection in hazardous bushfire risk areas in relation to poles and all pole top asset classes impacted by this change met the general*

254 Section 7.9.2

255 ASD – ESV request to submit revised bushfire management plan

256 AusNet response to IR009 Q40

257 ASD – ESV request to submit revised bushfire management plan, clause 19

*duties imposed on the Supplier pursuant to section 98 of the Act, including the application of the Supplier's ESMS.'*[258]

1026. The notice required that unless ESV received a submission in accordance with its direction notice, a revised bushfire mitigation plan must be submitted to ESV on or before 01 October 2023 that adopted the revised inspection frequency.

1027. ESV considered that the reduced frequency of inspections will 'likely lead to an increase in preventable asset failures, which will likely increase the risk of bushfire danger from the Supplier's supply network.'[259]

1028. ESV subsequently directed AusNet to 'replace the current inspection interval for all supply network assets within hazardous bushfire risk areas to a minimum of 30 months between inspections.'[260]

### The ESV direction is more onerous than required in the Act

1029. AusNet states that the ESV direction to inspect at a frequency not less than 30 months is more onerous than the requirements of the Energy Safety Act:

*'The step change is required to manage the cost impacts of a directive from Energy Safe Victoria to transition the regulatory inspection cycles from 37 months to 30 months for poles within High Bushfire Risk Areas (HBRA) from 1 January 2024. AusNet meets its HBRA ESV pole inspection obligations by:*

- *'Undertaking a ground-based inspection every 5 years.*
- *No later than 30 months (2.5 years) after this, undertaking an aerial inspection.*
- *No later than 30 months (2.5 years) after this, undertaking another ground-based inspection.*
- *Accordingly, the 30-month interval required by ESV from 2024 translates to 5 years between on foot inspections, as the aerial inspection is undertaken mid-cycle, with all HBRA poles inspected twice over the 5-year period.'*[261]

1030. We are satisfied that ESV, having issued this direction notice, has placed a new and binding obligation on AusNet Services. The direction notice included the requirement for development of a transition plan, and therefore we rely on AusNet's timeline to achieve the new requirements.

1031. In Table 6.5 we provide relevant clauses from the Electricity Safety (Bushfire Mitigation) Regulations 2023 and Bushfire mitigation plan that apply to the pole inspection frequency. Whilst the requirement to adopt a frequency of 30 months is more stringent than required by the Act, it is the same standard that AusNet appears to have applied in its earlier bushfire mitigation plan and which was implemented prior to AusNet making the change.

258 ASD – ESV request to submit revised bushfire management plan, clause 20

259 ASD – ESV request to submit revised bushfire management plan, clause 21

260 ASD – ESV request to submit revised bushfire management plan, clause 10

261 AusNet response to IR009 Q40

*Table 6.5: Summary of regulatory requirements for pole inspection*

| Source | Details of relevant clause |
|---|---|
| **Electricity Safety (Bushfire Mitigation) Regulations 2023** | Clause 7 Prescribed particulars for bushfire mitigation plans—major electricity companies<br>(o) a plan for inspection that ensures that— (i) the parts of the major electricity company's supply network in **hazardous bushfire risk areas are inspected at intervals not exceeding 37 months** from the date of the previous **inspection**; and (ii) the parts of the major electricity company's supply network in other areas are inspected at specified intervals **not exceeding 61 months** from the date of the previous inspection; |
| **Bushfire mitigation plan (current) v28 (2022) published on website** | Section 8.2.1 SCHEDULED POLE INSPECTIONS<br>A three year interval, cyclic inspection program, is maintained for AusNet Services' supply network assets and Private Overhead Electric Lines (POEL) located within hazardous bushfire risk areas (HBRAs).<br>Cyclic inspection of poles within HBRAs is undertaken through the combination of ground (test & inspection) and aerial based inspection cycles, **each set to 72 month intervals**.<br>These two inspection cycles are **offset by 36 months to one another to ensure inspections are undertaken within the 37 month interval prescribed in the Electricity Safety (Bushfire Mitigation) Regulations**.<br>Poles unable to be inspected by aerial methods are scheduled for an additional ground based visual inspection. Cyclic inspection of poles in areas other than hazardous bushfire risk are undertaken **within the 61 month interval prescribed in the Electricity Safety (Bushfire Mitigation) Regulations**.<br>Inspection schedules for poles are set within the asset data management system (SAP). |
| **Bushfire mitigation plan (current) v24 (2017)[262]** | Section 8.2.1 SCHEDULED POLE INSPECTIONS<br>A three year interval, cyclic inspection program, is maintained for AusNet Services' at risk supply network assets and Private Overhead Electric Lines (POEL). Cyclic inspection of at risk poles is undertaken through the combination of ground (test & inspection) and aerial based inspection cycles, **each set to 60 month intervals.**<br>These two inspection cycles are **offset by 30 months to one another to ensure inspections are undertaken within the 37 month interval prescribed in the Electricity Safety (Bushfire Mitigation) Regulations**.<br>Poles unable to be inspected by aerial methods are scheduled for an additional ground based visual inspection. A transition plan has been implemented that will see all overhead supply assets located in areas other than hazardous bushfire risk areas move from 63 and 123 month inspection intervals for timber and concrete poles respectively, **to a 61 month inspection interval** by 30th June 2019. The transition is in response to a new regulatory obligation introduced within the Electricity Safety (Bushfire Mitigation) Regulations 2013. The plan has been approved and an exemption to the regulations provided by Energy Safe Victoria (ESV) for the transition.<br>Inspection schedules for poles are set within the asset data management system (SAP) which enables forward planning and forecasting. Maintenance and/or replacement activities identified through the cyclic inspections are recorded within the asset management system. |

[262] AusNet provided v24 of it bushfire mitigation plan an application to the AER seeking a determination, with respect to the installation of REFCLs and associated works, 31 March 2017.

### New obligation was introduced for commencement in FY24 and therefore was not included in the FY23 base year for use in determining the forecast opex for the next RCP

1032. We have considered the justification for additional pole inspection opex only, and not AusNet's overall opex forecast or the application of the BST forecasting method more generally, nor the application of relevant regulatory incentive schemes.

1033. AusNet had previously implemented a longer inspection cycle and which formed the basis of its incurred opex in its nominated base year of FY23. Consistent with the application of the base step trend (BST) opex forecasting method, step changes are only considered where the costs are not reflected in the base year or rate of change.

1034. In responding to the ESV direction notice, AusNet determined that the most efficient option was to adopt a change to its pole inspection cycle which required a proportionate increase in pole inspection and assessment resources. This change has been applied in the year following the nominated base year, and therefore the costs are not included in AusNet's nominated base year for opex forecasting purposes.

### AusNet states that it has responded to stakeholder engagement

1035. AusNet states that it responded to concerns from its consumer group that it had previously benefited from the reduced opex from extending the inspection cycle:

> *'As part of our engagement on step changes with them, the Opex and Benchmarking Panel considered that if we had benefited financially from a prior decrease in inspection frequency (from five to six years) that occurred in 2019, then our proposed step change for 2026-31 would prevent customers from sharing in those benefits through the EBSS. We have examined our historical spend and found that, despite this prior change, our inspection costs increased in 2018-19 and, therefore, AusNet did not financially benefit from the previous change. This is because, despite the increased inspection frequency occurring in 2019, our asset inspection costs increased due to a range of other factors. This is demonstrated in the figure below. Accordingly, we have retained a step change in our 2026-31 forecast, to manage the cost increases associated with the 2024 increase in inspection frequency.'*[263]

1036. The inspection costs expressed in nominal terms provided by AusNet in figure 7-11 of the regulatory proposal, show a small increase from CY18 to CY19 (7.9%) and from CY19 to CY20 (5.3%). We consider that this data does show an increase, after inflation has been considered in those years. However, we have not reviewed the application of the EBSS to AusNet and our assessment is of a technical nature only, and does not consider such regulatory mechanism.

### The proposed increase in pole inspection cost is in addition to the escalated base year expenditure

1037. AusNet has undertaken a bottom-up build of its required resource effort, based on an assessment of the additional resources it considers are required. As a part of the onsite presentation slides, AusNet stated:

> *'An additional 6 resources have been used as the basis of the step change, in the last few months we have seen this amount become an additional 15 resources, with our current numbers equalling to 40 inspectors and 15 assessors.'*[264]

1038. AusNet subsequently amended its proposed opex step change, by reducing the resources from 6 to 4, referring to its 'adjusted' requirements. As a part of the onsite presentation slides, AusNet's estimate was decreased to 4 resources through reduction of its estimate of assessors:

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263 AusNet regulatory proposal EDPR 2026-31, page 245

264 AusNet onsite presentations slides, slide 102

*'We have further explored this uplift in assessors and although our current resourcing levels are at +5 assessors, the ESV directive for pole inspection increases explicitly justifies a 1 to 1.5 FTE increase in assessors. This is in line with current state 3 to 1 ratio between inspectors and assessors. We are currently spending an amount above the requested opex step change.'*[265]

1039. We are satisfied that the 'adjusted' cost of meeting the changed obligations is not reflected in the base year expenditure or growth factors in AusNet's opex forecast, which cover the potential growth in the number of poles and input costs (such as labour costs).

#### AusNet proposes to absorb the majority of its increases in pole management opex

1040. AusNet states that it has recently increased its pole management workforce by an additional 15 resources, of which 4 are included in the proposed step as shown in Table 6.6. Adjusting for team leader roles, assuming these were not included in the base number of inspectors, the growth is reduced to 11.

*Table 6.6: Growth in pole management workforce*

| Item | Base | Proposed step change | Additional (self-funded) | Total |
|---|---|---|---|---|
| Number of inspectors | 30 | 3 | 7 | 40[266] |
| Number of assessors | 10 | 1 | 4 | 15 |
| **Total** | **40** | **4** | **11** | **55** |

*Source: EMCa table derived from AusNet onsite presentation slides, slide 102*

1041. We understand that opex step changes should not double count the cost of increased regulatory burden over time, which forecast trend and productivity growth factors may already account for. We consider that AusNet has taken steps to absorb some of its cost increases associated with its pole management program.

1042. We are satisfied that there is no double count of the cost of the proposed pole inspection step change, and as a new requirement, this opex step change is not reflected in the historic 'average' change in costs associated with meeting its regulatory obligations. We also find that AusNet has reasonably apportioned the cost of meeting its regulatory obligations separately from other sources of cost.

#### Findings

1043. We are satisfied that AusNet's estimate of $6.2 million represents a reasonable estimate of additional prudent and efficient expenditure that it will incur. However, we have not considered this in the context of AusNet's overall opex step change proposal or the application of regulatory incentive mechanisms.

### 6.3.2 Hazard tree program

#### What AusNet has proposed

1044. AusNet has proposed an opex step change for a hazard tree program as part of its resilience program at a cost of $3.0 million per year, or $15.0 million for the next RCP, as shown in Table 6.3. AusNet submits that this meets the opex strep change criteria of a capex/opex trade-off.

265 AusNet onsite presentations slides, slide 102

266 Includes 5 team leaders and high-mast operators

1045. In support of the proposed opex step change, AusNet has provided a business case and cost benefit analysis.[267]

### Assessment

#### AusNet has an existing program to manage hazard trees

1046. AusNet has not advised of a change in obligations that has resulted in the proposed step change. Rather, AusNet advises that this step change is driven by plans to strengthen the resilience of the network, as a part of its resilience program of initiatives.[268]

1047. We understand that AusNet currently meets its line clearance obligations, including by application of its hazard tree program included in:

- Annual inspection of clearance space - vegetation assessors identify trees of interest while undertaking annual inspections of clearance space (level 1 assessment); and AusNet's qualified arborists then conduct detailed assessments to determine whether the trees fit the hazard tree criteria or not (level 2 assessment)
- Target inspection - AusNet's qualified arborists undertake targeted inspections of areas with known reliability issues (level 2 assessment); they also undertake targeted inspections of codified areas (level 2 assessment), and
- Public notification - a member of the community alerts AusNet to the presence of a potential hazardous tree, in which case one of AusNet's qualified arborists then conducts a detailed assessment to determine whether the tree fits the hazard tree criteria or not (level 2 assessment).

#### The target of the proposed program is in response to a predicted increase in extreme weather and which should be considered as part of a network resilience

1048. AusNet states that the benefits are limited if not considering changes in climate:

> *'Additional hazard tree management is expected to yield limited returns under current climate conditions particularly once amenity and the value of tree canopy are considered. See Chapter 0 for more details on our hazard tree opex step change proposal.'*[269]

1049. This confirms our view that this program is targeting extreme weather impacts and therefore should be considered as a resilience program, and subject to the criteria included in considering such programs. Consideration of the resilience program, and any overlap between this initiative and the proposed resilience program is beyond the scope of our review.

#### AusNet's cost-benefit analysis is heavily influenced by the inclusion of MED events

1050. AusNet states that an increase in its hazard tree program by [redacted]. at an additional cost of $3 million p.a. has net benefits of $39 million over 5 years. Approximately 82% of the benefits relate to reducing expected unserved energy on Major Event Days (MEDs).

1051. We asked AusNet to provide the basis for selection of the proposed volume of [redacted] hazard trees per year, and whether other volumes of Hazard tree reduction had been considered. AusNet's response is summarised as:[270]

- It appropriately balances the trade-off between price and service level improvements
- It has been demonstrated to offer net economic benefits to customers, and

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267 ASD - AusNet - Hazard tree program BC - 31012025 – CONF and ASD - AusNet - Hazard tree program economic model - 31012025 - CONF

268 On page 184 of its regulatory proposal, AusNet refer to Opex step changes for resilience (hazard trees and preparedness and response), and which are further discussed in section 7 of the regulatory proposal

269 Regulatory proposal page 184

270 AusNet's response to IR009 Q36

- It represents a modest uplift on current hazard tree management levels that is expected to be consistent with the relevant Victorian planning schemes governing our vegetation management activities.

1052. AusNet's analysis is heavily influenced by MEDs (vegetation and weather) experience in FY24. We understand that AusNet also submitted a cost-pass through application for storms that impacted its network in February 24.

1053. AusNet also acknowledge that the amenity value of trees by the public and the legal framework that it operates under limits its ability to trim trees.

### AusNet has not presented the avoided costs of this program, noting a capex option is expected to incur a high cost

1054. AusNet presents the proposed opex step change as an example of a capex/opex trade-off, for which we would have expected that the avoided capex would have been quantified. AusNet bases its costs on its existing HBRA program. Whilst the avoided costs are not included, the capital costs of replacement / upgrading the network will likely materially exceed the proposed solution.

1055. Based on AusNet's claims we were surprised not to see avoided costs relating to reduced reactive vegetation management, which we consider would be able to be quantified, but were not provided. We first considered whether the estimate of benefits was reasonable, as presented by AusNet, and whether the expected benefits exceed the costs of the proposed solution.

### Probability of a hazard tree causing an outage of 75% is overstated

1056. AusNet has assumed an annual benefit of $7.8 million based on each avoided hazard tree incident having a probability weighted benefit of [redacted] When multiplied by [redacted] cuts per year, the proposed expanded hazard tree program is estimated to generate benefits of $~7.8 million per year. This is estimated to reduce the cost of outages from ~$17 million to ~9 million p.a.

1057. The assumptions applied by AusNet are summarised in Table 6.7.

[redacted]

1058. If there was an event, then the probabilities that AusNet has assumed may be reasonable. However, this risk analysis considers an incident as a certainty. We consider that AusNet has an existing vegetation management program including an existing hazard tree program. Therefore, the probability of an identified hazard tree causing an incident that leads to a customer outage is much lower than AusNet has assumed.

1059. We consider that after taken account of lower probability this program would not be benefits positive.

### Findings

1060. We consider that the proposed opex step change for the Hazard tree program has not been sufficiently justified.

1061. AusNet has not demonstrated that sufficient benefits arise from the proposed program and therefore it does not represent prudent and efficient expenditure. We consider the target of the proposed program is to mitigate a predicted increase in extreme weather events, and to which we consider that the program also needs to meet the network resilience assessment criteria, and which it does not.

### 6.3.3 Early fault detection

#### What AusNet has proposed

1062. AusNet has proposed an opex step change for the introduction of early fault detection technology at a cost of $7.8 million for the next RCP. We consider the opex step change for early fault detection in our assessment of the associated capex in section 4.3.2 of this report.

#### Findings

1063. In our assessment of the capex proposed for early fault detection, the proposed early fault detection opex step change forms part of a broader program (for licencing), and that program is not well justified.

1064. As we present in section 4.3.2 the program lacks sufficient demonstration of the benefits due to the emerging nature of the proposed technology and therefore does not present prudent or efficient expenditure. Accordingly, we find that neither the capex nor proposed opex step change is prudent.

## 6.4 Findings and implications for proposed opex step changes

### 6.4.1 Summary of findings and implications

#### General

1065. In the current section of this report, we have reviewed three of the proposed opex step changes totalling $30.9 million for pole inspection, hazard tree reduction and early fault detection. AusNet presents the opex step changes within our scope of review as responding to:

- regulatory change: pole inspection
- capex/opex trade-off: early fault detection and hazard tree program

#### Assessment against step change criteria

##### Regulatory change for pole inspection has been demonstrated

1066. We consider that AusNet has demonstrated a change to its regulatory obligation and that it will need to incur expenditure that is incremental to its base year opex, to meet this obligation.

##### Capex/opex trade-off for remaining opex step changes has not been sufficiently demonstrated

1067. We are not satisfied that the opex step changes proposed by AusNet for hazard tree and early faut detection meet the standard step change criteria. Specifically,

- Early fault detection – as discussed in section 4.3.2, we consider the program is not well justified, lacks sufficient demonstration of the benefits due to the emerging nature of the proposed technology, and therefore does not present an efficient capex-opex trade off.

- Hazard tree program - we do not consider that sufficient benefits arise from the proposed program and therefore does not present efficient expenditure.

### 6.4.2 Implications for proposed opex step change allowances

1068. We are satisfied that AusNet has justified the need for additional opex for pole inspection and that the adjusted costs of $6.2 million included by AusNet are necessarily prudent and efficient.

1069. We are not satisfied that AusNet has justified the need for an opex step change for its proposed Early fault detection or its proposed Hazard tree program, or that the proposed costs are necessarily prudent and efficient.

# APPENDIX A – CER AND ELECTRIFICATION MODELLING ISSUES

## A.1 Introduction

### A.1.1 AusNet's application of economic modelling in determining its proposed CER and electrification expenditure

1070. As we describe in section 5, AusNet's proposed CER and electrification expenditure for the proactive component of its voltage compliance program and for its proposed LV augex (electrification and flexible services) program, are derived from economic assessments.

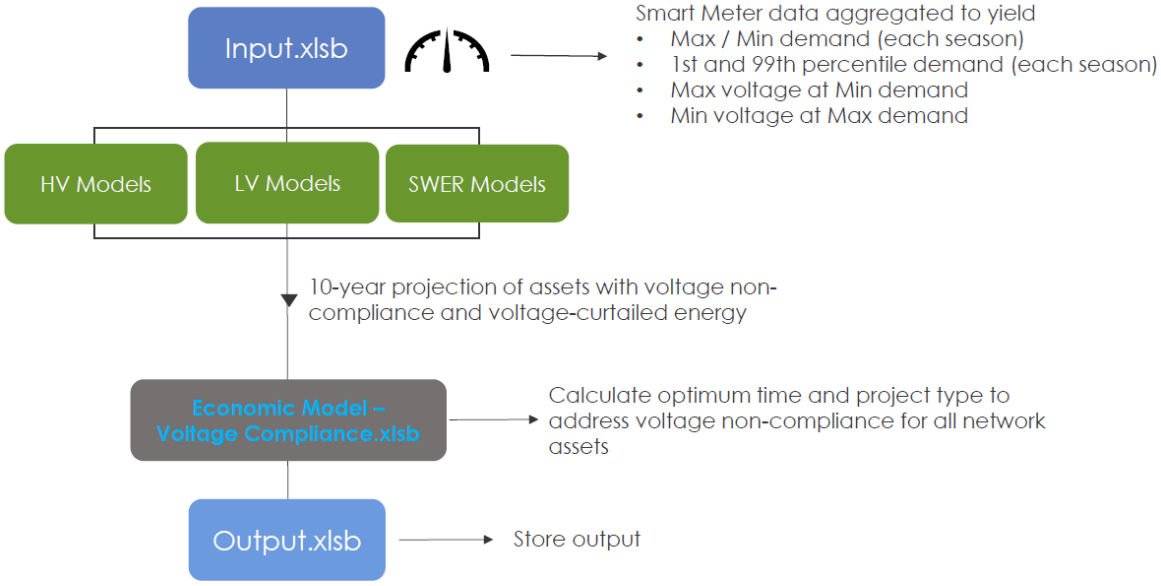
1071. An important aspect of these models is that AusNet uses them not just to assess the economics of an otherwise defined program, but rather to build up a proposed program by utilising economic assessment to identify a suite of interventions that AusNet assesses as individually having a net economic benefit. In other words, the scope and scale of the proposed program is derived from technical and economic modelling which includes a set of economic assumptions.

### A.1.2 Model descriptive information

1072. AusNet provides a description of the models referred to in the diagram above, including how they are applied to determine its proposed Voltage Compliance program, Electrification Program and (though not within our scope) proposed CER Enablement program.[271]

1073. AusNet provides an illustration of its modelling approach, which we have reproduced in figure A.1.[272]

*Figure A.1: AusNet's modelling approach for Voltage Compliance*




*Source: AusNet presentation at onsite meeting, 3 April 2025, page 100*

271 AusNet Hosting Capacity Methodology

272 We show here AusNet's model flow diagram for Voltage Compliance. Its equivalent diagram for its LV electrification program is essentially identical, with the 'economic model' being bespoke to LV electrification assessment.

1074. AusNet provided versions of its economic models with its regulatory submission, though for the most part these models were hard coded, meaning that we needed to rely on AusNet's descriptive information of their logic flows. We sought additional information through a series of information request questions[273] and the matters we raise in this section result from our review of the combination of:

- Documents and models provided with AusNet's regulatory submission
- AusNet's onsite presentation material, and
- Documents and model examples that AusNet provided in response to our information requests.

1075. We asked for a version of the model that includes formula that would then allow us to trace the modelling relationships and AusNet provided such a model in April 2025. Our observations here apply to the later version of the model.

### A.1.3 Identified modelling issues

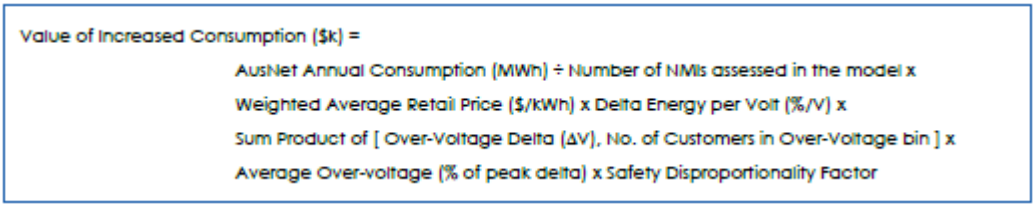
1076. For the substance of our review of AusNet's proposed expenditure, we refer to section 5. In this appendix, we identify issues that we consider have materially detracted from the validity of the output of these models, and which AusNet has relied on as the basis for its proposed expenditure.

## A.2 Critical economic model input assumptions

### A.2.1 Assumed costs of overvoltage in Voltage Compliance economic model

1077. In its Voltage Compliance economic model, AusNet specifies the value of increased consumption (due to over-voltage) as shown in figure A.2.

*Figure A.2: AusNet's specification of risk-cost value for increased consumption and adverse safety due to over-voltage*




*Source: AusNet hosting capacity methodology, page 41*

1078. We consider that there are two significant issues embodied in this specification:

- The economic value of a 'safety' impact would not be a function of the electricity retail price,
- Applying a Disproportionality Factor to the retail price is not a valid application of a Disproportionality Factor, which is used to apply to safety risks that have been otherwise determined, but which are considered to be 'disproportionate' for an explainable reason under 'AFAP'
- AusNet's formula assumes a direct proportional relationship between overvoltage and safety risk-cost and takes no account of either the probability of a safety risk event occurring or the 'cost of consequence' if that safety risk event occurs, and
- AusNet also states, without evidence, that it uses a default value of 30% for the average over-voltage.

[273] IR20, questions 82 to 104

1079. Because the risk-cost specified as shown above defines the economic benefit that AusNet's model is goal-seeking, invalid quantification of the value of the risk-cost that AusNet is seeking to mitigate invalidates the scope and scale of the interventions derived from its modelling and which form the basis for AusNet's proposed proactive Voltage Compliance program.

1080. Even without the safety risk Disproportionality Factor, the electricity retail price would not be a suitable proxy for the economic value of additional consumption.

1081. Separately and in combination, these factors result in an overstatement of the economic benefits of rectifying overvoltage issues, and which we consider likely to be of significant magnitude.

## A.2.2 Assumed costs of under-voltage and overloads in Electrification economic model

### Assumptions in AusNet's modelling

1082. In its Electrification economic model, AusNet specifies the value of Expected Unserved Energy (due to under-voltage) as shown in figure A.3.

*Figure A.3: AusNet's specification of risk-cost value for expected unserved energy (EUE) due to under-voltage*

Value of Expected Unserved Energy (y) ($) = Expected Unserved Energy (y) (MWh) x VCR ($/MWh) x CPI Escalation

*Source: AusNet hosting capacity methodology, page 45*

$$Unserved\ Energy\ at\ Risk_{POE\ (y)}\ (kWh\ pa) = \frac{1}{2}\sum_{hh=1}^{17520} F_{hh}\ x\ max[0, Load_{POE}\ (kW)_{(hh,y)} - Import\ Rating\ \ (kW)\ ]$$

*Source: AusNet hosting capacity methodology, page 17*

1083. Taking the two formulas above in combination, effectively:

- AusNet's modelling assumes that energy is 'unserved' to the extent that load exceeds the import rating of the system for any period, and
- The assumed unserved energy is valued at VCR and escalated by CPI.

1084. AusNet's methodology document also introduces the first of these formulas as defining the 'value of expected unserved energy in present value terms', though this would require application of a discount rate or discount factor that is not present in the formula as presented.

### Issues leading to overstatement of economic benefits

1085. We consider that these formulas present the following significant issues:

- In our experience, a load that exceeds the import rating does not directly lead to a loss of supply to a customer, and
- To the extent that there is a period of under-voltage supply, this too does not directly lead to a complete loss of supply to a customer, or to impacts that would be valued at VCR.

1086. We interpret AusNet's response to one of our Information Requests as essentially contradicting its modelling assumption that all overload/under-voltage represent a loss of supply that should therefore be valued at VCR[274]:

[274] Quotations from AusNet response to IR20, Q91

*'…(power * time) above the import rating represents estimated amount of unserved energy due to thermal overload that **could** lead to loss of supply. [EMCa emphasis added]*

*The load duration curve considers the magnitude and the frequency of the overload which can be directly correlated to reduction in plant useful life and in some extreme cases immediate failure i.e. the more frequent or extreme the overload, the higher the reduction in plant useful life due to accelerated degradation of winding insulation.*

*The scenario which loss of supply [sic] is exclusive to inverter-based loads such as EV charging would only occur if the network voltage drops below a certain threshold and the EV is charging.*

1087. In other words, while it is reasonable to assume a correlation between overload and reduced plant life, this does not automatically lead to failure. Similarly, AusNet refers to only to EV charging being potentially interrupted by under-voltage, but we consider that a reasonable view would be that the typical 'inconvenience' cost to a customer of a delay in charging an EV would be far less than VCR. By contrast, AusNet's economic model effectively assumes an outage probability of 1.0 where and when an overload occurs and an outage-based VCR cost to consumers when they are supplied at undervoltage.

1088. Separately and in combination, these factors result in an overstatement of the economic benefits of rectifying undervoltage issues, and which we consider likely to be of significant magnitude.

#### Further evidence of overstatement of modelled benefits

1089. In its response to our Information request on assumed EUE, AusNet provided the information shown in the table below on unserved energy due to overloads.

1090. There is a very significant discrepancy between this information and the information provided in Figure 4 of AusNet's Business Case for demand driven augmentation, which shows a forecast that commences at around 8,500 MWh and rises, compared with the data below which shows actual unserved energy in kWh. This provides further evidence that AusNet's assumed 1:1 relationship between overload and unserved energy is not supported by its own information and represents an overstatement that appears to be to several orders of magnitude.

*Table A.1: AusNet information on unserved energy due to overloads*

| | 2018 | 2019 | 2020 | 2021 | 2022 | 2023 | 2024 | 2025 |
|---|---|---|---|---|---|---|---|---|
| Number of sites that experienced outages due to overload | 437 | 445 | 300 | 155 | 240 | 140 | 165 | 91 |
| Amount of unserved energy (kWh) | 26,730 | 19,599 | 10,431 | 5,203 | 18,174 | 8,435 | 12,779 | 13,965 |

*AusNet response to IR20, Q91*

## A.3 AusNet's modelling approach

### A.3.1 AusNet's approach to identifying economically beneficial interventions

1091. Using its Electrification model as an example, AusNet's modelling seeks to identify economically beneficial interventions, by testing against defined economic goals for every Distribution Substation and every SWER line.

1092. In its modelling documentation, AusNet describes a process whereby it:

- First filters to exclude projects with a negative NPV, and
- Seeks to find the 'optimum year' for each intervention and excludes projects for which the optimum year is beyond the next regulatory period.[275]

1093. In reviewing its models, we find that AusNet then ranks the remaining projects based on descending PVR (i.e. taking those with the highest benefit:cost ratios first) and spreads the projects approximately evenly over the period, prioritising those with the highest PVR first.

1094. In its economic model for electrification, we observe that AusNet appears to prioritise undertaking all SWER projects initially (i.e. in 2027) before commencing DSS augmentations.

### A.3.2 Issues and apparent anomalies in AusNet's modelling

#### AusNet's method for finding the optimum year is not valid

1095. We describe a general issue in Appendix B, with specifying the annuitised cost only as the product of the capex and the discount rate, rather than using a uniform series present worth factor that accounts for the life of the asset. AusNet's formula effectively assumes that the intervention investment will have an infinite life. Correcting this formula to account for the life of the relevant investment assets would materially increase the annuitised cost, with the effect that the optimum timing for projects will be later.

#### AusNet's optimal timing results are not consistent with addressing an increase in impacts due to electrification

1096. Inspection of the model provided shows that, almost invariably, projects with a negative NPV present as having an optimum timing of 2037 (which, in AusNet's model, is simply a proxy value for 'beyond the next regulatory period'.[276] Conversely, those that have a positive NPV almost invariably have an optimum year of 2025, which could be taken as indicating (if the input assumptions were valid) that the project should have been already undertaken. There is a minimal number of projects for which the model determines that optimal timing is in some year within the next period.

1097. If, as AusNet suggests, the proposed interventions are driven by **increasing** electrification over the next period, then we would expect this to show as 'optimal timing' results that similarly occur and perhaps increase over the period, as electrification occurs. That almost all projects that AusNet has proposed are found to have a positive NPV already (i.e., in the model, in 2025) is a further indicator of significantly overstated benefit assumptions.

#### The included projects are highly sensitive to the PVR

1098. In AusNet's economic model, the PVR for each proposed project is shown and we can see that projects are ranked by this.[277] We observe that projects are included with a PVR of only 1.0 and that 573 projects, representing around half of the interventions that AusNet has proposed, have a PVR of less than 5.0. While we have no information to endorse a specific value for the PVR, since it relies on an evidenced value for the electrification benefits, this provides some indication as to how sensitive the model is to the input assumptions referred to above.

## A.4 Conclusion on AusNet's economic modelling for CER programs

[275] See page 44 of AusNet hosting capacity report

[276] In AusNet's Economic Model – Electrification, sheet DSS_NPV, column AF

[277] AusNet's Economic Model – Electrification, column BM

1099. The scope of interventions that are considered to be justified, and therefore the proposed expenditure for these two programs, is determined solely by AusNet's economic modelling.

1100. From our review of descriptive information that AusNet provided, and of the economic models themselves, we consider that:

- Input assumptions for benefits are not justified, and are significantly overstated, and
- AusNet's calculation of the annuitised cost of the interventions is incorrect and understates this cost.

1101. For both reasons above, but mostly due to the inputs driving benefit assumptions, we consider that AusNet's economic modelling is not producing a program of work that is economically justified

1102. We also note that AusNet's economic model is based on input from technical simulation modelling that has been conducted for AusNet. The methodology described for this appears reasonable, however it too is based on significant assumptions regarding electrification uptake and future customer usage behavioural patterns in an evolving sector that presents a challenge to any such forecasting to 2031.

# APPENDIX B – ECONOMIC ASSESSMENT METHODOLOGY ISSUES

## B.1 Introduction

1103. For projects that AusNet has sought to justify on economic grounds, it provided supporting economic models. In a number of instances, we find one or other of the following issues, which appear to be systemic.

## B.2 Economic timing

### B.2.1 General principles

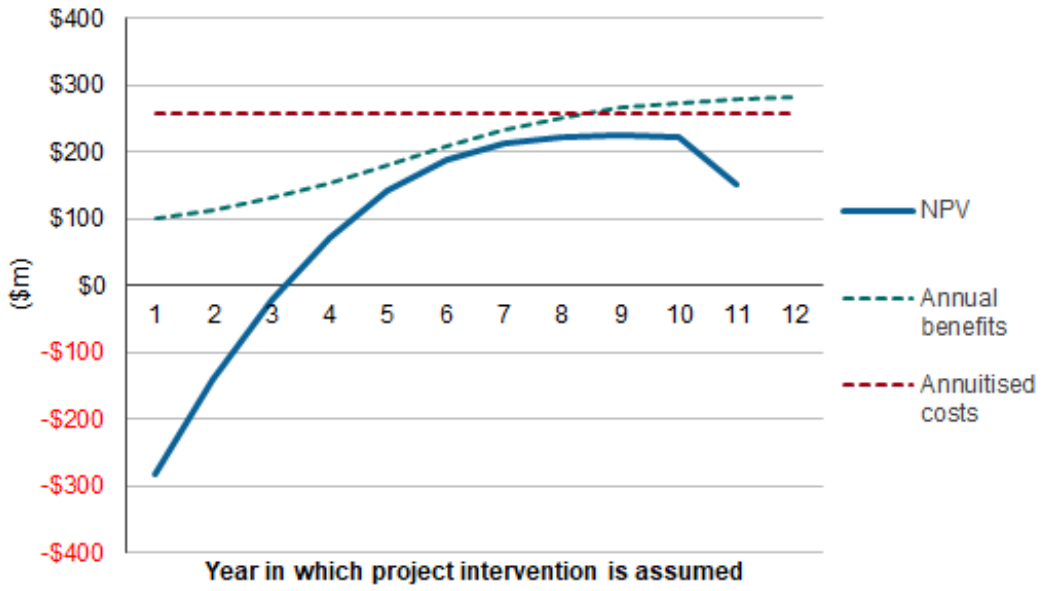
1104. It is frequently the case in economic assessments in support of electricity infrastructure investments, that there is an escalating counterfactual economic cost (including an escalating risk-cost), and which the proposed investment is intended to address. This increasing cost for the counterfactual therefore defines the benefit that can be achieved by the proposed solution.

1105. The question of identifying the optimum economic timing for the solution was addressed by AER in an industry practice application note.[278] In short, under microeconomic theory, it can be shown the optimum timing occurs when the annual benefits exceed the annuitised cost.

1106. The illustration in Figure B.1 shows a project for which benefits (green) increase over time. The annuitised cost of the project is shown in red. The blue NPV line shows the NPV for this project as a function of when the project is assumed to be undertaken – that is, it reflects a series of timing options for the project, if undertaken in any year up to the eleventh year.

278 AER, Industry practice application note; Asset replacement planning, January 2019. See Figure 1 (page 37)

*Figure B.1: Illustration that defines the optimum timing for an investment*[279]




*Source: EMCa (illustrative example only)*

1107. As can be seen from the graph:

- If undertaken prior to year 3, the project would have a negative NPV
- If the project was undertaken in any year from year 3 to year 7, the annual benefits are less than the annuitised cost and it would therefore not be economic to undertake the project:
  - this is the case despite the project having a positive NPV if undertaken after year 3; this result occurs because the net benefits beyond year 7 in this example more than offset the net costs before that (in the NPV calculation), but it remains the case that the project is not economic if undertaken in the period up to year 7 because the benefits do not exceed the cost ***in that period***
- From around year 8, the example shows that the annual benefits exceed the annuitised cost, demonstrating that the project is then justified; the graph shows that this timing also provides the highest NPV of the timing options considered, and
- If the project was deferred beyond year 8, the NPV declines, because the net benefit of undertaking the project (as evidenced by the green benefits line exceeding the red annuitised cost line) is lost.

## B.2.2 Observed issues

1108. In reviewing projects that AusNet proposed based on claimed net economic benefits, we observe the following instances:

- Setting a target 'PVR' (Present Value Ratio) of 1.0, as a filter to determine the suite of projects that have a positive NPV, and which are then assumed to be included in the proposed program, and
- Where an annuitised cost is used (as per the methodology described above), the annuitised cost is miscalculated in that it is derived simply as the product of the capex and the discount rate, without reference to the 'life' of the asset which should also be included in the annuitised cost formula - this leads to an understatement of the

[279] Analysis in this worked example is based on an asset that is assumed to last, and therefore provide benefits for, 20 years from the date that it is commissioned. Benefits therefore continue beyond year 12 but are shown only to that year in order to focus on the timing decision.

annuitised cost which results in a bias towards bringing forward optimised timing, therefore overstating the extent of work that is justified within the regulatory period.

1109. We consider these matters especially problematic where economic modelling of hundreds or thousands of potential interventions is simulated to determine a scope of work by applying a logic goal that progressively tests each potential intervention year-by-year for a positive NPV. If the modelled goal is set only to identify when each potential intervention would first have a positive NPV or is determined using an understated annuitised cost, then the modelling will almost certainly be biased towards including such interventions prematurely and therefore over-estimating the extent to which such interventions are economically justified within the period.

# APPENDIX C - REVIEW OF HISTORICAL PERFORMANCE

## C.1 Summary

1110. We observe that the network performance has generally been improving, along with asset performance despite the impact of several major weather events across Victoria. For AusNet's network:

- Average reliability performance is generally improving, with decreasing frequency of outages with more current information suggesting an upward trend in unplanned SAIFI due to asset failure related SAIFI
- AusNet has experience some of its worst outage events on record, caused by extreme weather
- Increasing number of cost pass through applications for the increased costs associated with natural disasters
- Despite improvement in 2021-22, the rate of line clearance non-compliance has declined and is at its highest level including being above the average of all DNSPs
- Network utilisation shows a slight increasing trend over the last 10 years, and remains higher than the DNSP average

1111. We observe that the actual expenditure has historically tracked lower than the forecast expenditure. Issues such as increasing labour and material costs, and deferral of works that occurred during the current RCP also have implications for the forecast in the next RCP, and we consider the implications in the projects and programs that we have reviewed. For AusNet's network:

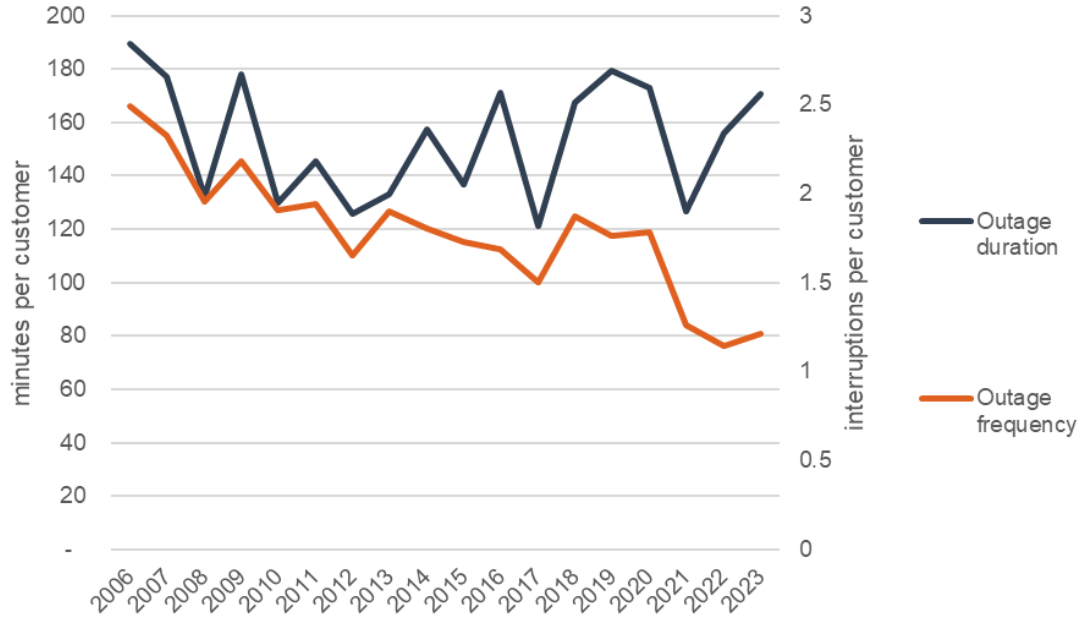
- Capex delivery performance is subject to a range of factors, with actual capex tracking more closely to forecast capex recently
- Despite this trend, AusNet expects to overspend the capex allowance
- Over the last 5 years, actual opex is lower than the forecast opex resulting in a material underspend against the opex allowance

## C.2 Current period service performance

**Average reliability performance is generally improving, with decreasing frequency of outages with more current information suggesting an upward trend in unplanned SAIFI due to asset failure related SAIFI**

1112. The AER notes that, on average, reliability had been improving for customers. Figure C.1 shows average outage duration and outage frequency data for AusNet based on the AER network performance report data. This indicates a flattening of outage duration and clear improvement in outage frequency.

*Figure C.1: Comparison of AusNet historical outage duration and outage frequency*

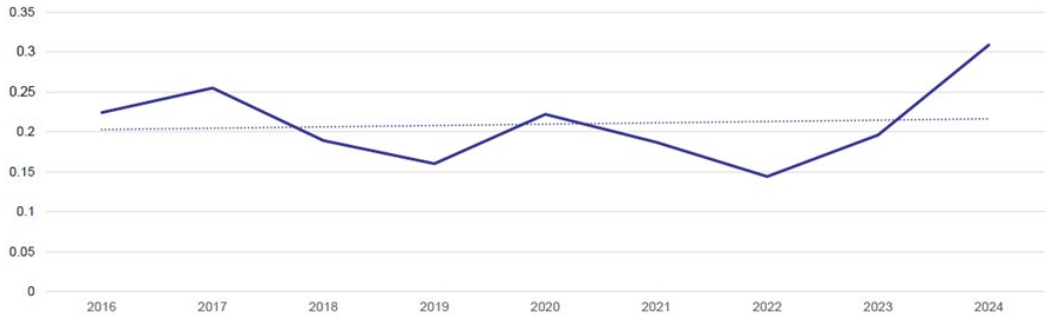



*Source: AER Network performance report*

1113. Outage frequency may be considered as an indicator of the effectiveness of asset management, to the degree that the trend is linked to preventable events and not actions of extreme weather or third parties.

1114. However, Figure C.2 shows more current information as presented by AusNet, which indicates an upward trend in unplanned SAIFI due to asset failure. We make further observations as it relates to the scope of our assessment of the expenditure as relevant.

*Figure C.2: AusNet Unplanned SAIFI due to asset failure*




*Source: AusNet regulatory proposal, Figure 6-14*

### AusNet has experience some of its worst outage events on record, caused by extreme weather

1115. Whilst the improvement in reliability has been based on mattes within the DNSP control, the AusNet network has been subjected to some extreme events over the last 5 years including:

- **2019/20 bushfires**: The "Black Summer" bushfires caused widespread devastation across regional areas and in total, 1,000km of AusNet's powerlines were affected resulting in 60,000 of our households and businesses being off supply. Over 1.5 million hectares were burnt in the fires and more than 300 homes were destroyed. This was the first time the Victorian Government declared a state of disaster.
- **June 2021 storms**: On 9 June 2021, major storms caused widespread damage across Victoria. Parts of Victoria recorded more than 280 mm of rain and experienced wind

gusts of more than 100 km per hour. Three days after the event, 68,000 homes and businesses remained off supply, while more than 9,000 homes and businesses remained without supply a week later. At the time, it was the largest storm on record. In total, fourteen 66kV powerlines were taken out of service, fifty-eight 22kV powerlines reported faults and 10 zone substations went black in AusNet's distribution area. This resulted in 249,000 households and businesses being off supply.

- **October 2021 storms**: On 29 October 2021 (within months of the June 2021 storm) another storm event created widespread devastation. Damaging winds (e.g., 146 km/h at Wilsons Promontory) rain and hail hit Western Victoria, the southwest and Metro Melbourne. As a result, nearly 530,000 homes and businesses across Victoria were off supply at peak. Three days after the event, approximately 24,000 homes and businesses remained off supply, with over 2,500 homes and businesses still without supply after one week.
- **February 2024 storms**: On February 13, 2024, Victoria experienced a catastrophic storm event that damaged 12,000 km of powerlines and poles across the state's electricity distribution businesses, causing widespread power outages. Six 500kV transmission towers collapsed and AEMO instructed load-shedding of approximately 92,000 homes and businesses, state-wide. The February 2024 storm is the largest that AusNet has experienced, resulting in more than 297,000 of our customers being off supply.
- **September 2024 storms** – On 1-2 September 2024, Victoria experienced an extreme storm that caused widespread damage to many households, businesses and infrastructure and widespread outages across our network. Approximately 340,000 homes and businesses lost power. Damaging winds were recorded overnight (e.g., 146 km/h at Wilsons Promontory) and the Bureau of Meteorology likened the event to a category two or three cyclone8. Due to improvements in our operational response since the February 2024 storm event, all customers were restored by 8 September, 1 week after the event.

1116. AusNet submitted cost pass through applications for its February 2024[280] and September 2024[281] storm events.

### Increasing number of cost pass through applications for the increased costs associated with natural disasters

1117. Cost pass through applications being received by AER are increasing. The AER states[282] that in 2023 an additional $61m of pass-through revenues are associated with natural disasters impacting the network assets across the NEM, including AusNet Services.

### According to the safety regulator ESV, the number of all asset failure incidents and contact incidents are lower than the long-term average

1118. ESV publish the number of serious electrical incidents reported to Energy Safe by AusNet Services during the 2022–23 period, in its 2023 safety performance report on Victorian Electricity networks. The 2024 report was not available at the time of our review.

1119. According to ESV, the most common incidents on the AusNet network in 2022–23 were:

*'HV fuse failures, tree contact, animal contact and connection failures.'* [283]

1120. The asset failure incidents are decreasing for most asset types, with the exception of fuse failures which were 16 percent above average as shown in Figure C.3. ESV state that is

280 https://www.aer.gov.au/industry/networks/cost-pass-throughs/ausnet-services-cost-pass-through-february-2024-storm

281 https://www.aer.gov.au/industry/networks/cost-pass-throughs/ausnet-services-distr bution-cost-pass-through-september-2024-storm

282 AER, 2024 Electricity and gas network performance report

283 ESV, 2023 Safety Performance report on Victorian Electricity Networks

commencing a review of the conductor and connection management practices of all distribution networks in 2023–24.

1121. The number of fires were lower than the long-term average, except for fuse and conductor failures. The most common causes of fire incidents as shown in Figure C.4 were:

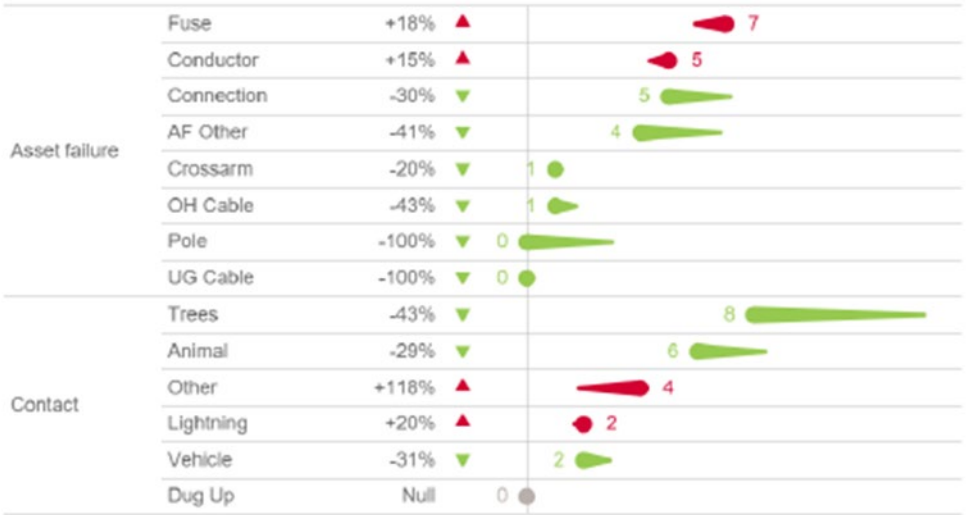
> *'Tree contact, HV fuse failures, animal contact and conductor and connection faults were the most common causes of network-related fires. The numbers of fires from contact incidents were higher than the long-term average in two categories (other contact events and lightning strike), lower in three categories (tree contact, animal contact and vehicle contact) and stable in one (dug-up cables).'*[284]

1122. ESV state that it is monitoring AusNet Services fuse management action and progress against its wood pole management improvement plan.

*Figure C.3: Incidents on the AusNet Services network*


*Source: ESV report, Figure 27*

*Figure C.4: Incidents on the AusNet Services network resulting in ground fires*



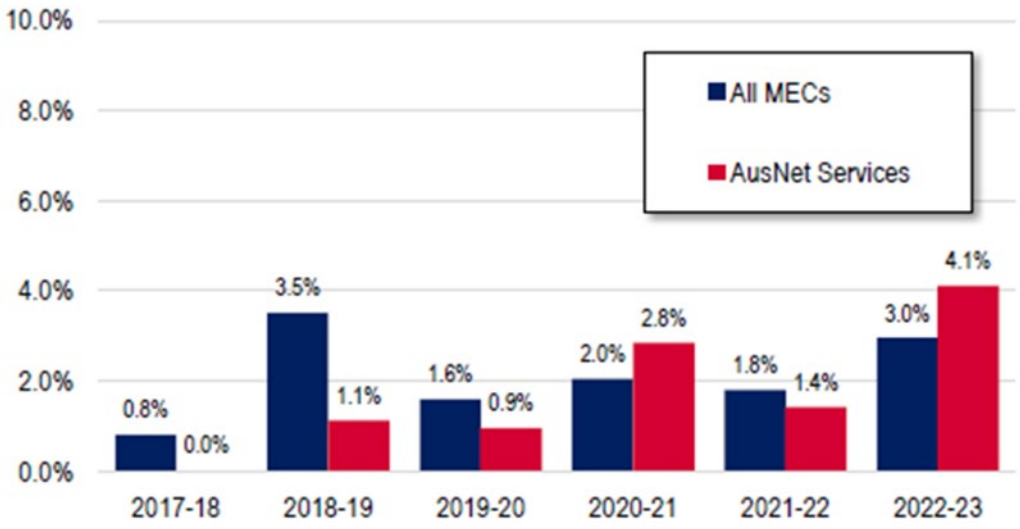

284 Ibid

*Source: ESV report, Figure 28*

### Despite improvement in 2021-22, the rate of line clearance non-compliance has declined and is at its highest level including being above the average of all DNSPs

1123. ESV also undertake inspections of the network to determine any spans that may not be compliant with the electricity line clearance regulations. The trend in major non-compliances is shown in Figure C.5. A major non-compliance is regarded as a high-risk situation where vegetation is touching, is growing through, or could soon touch, uninsulated conductors. This has resulted in greater use of ESV's enforcement option to issue infringement notices and fines.

*Figure C.5: Rate of AusNet major non-compliances (HBRA and LBRA)*




*Source: ESV report, Figure 26*

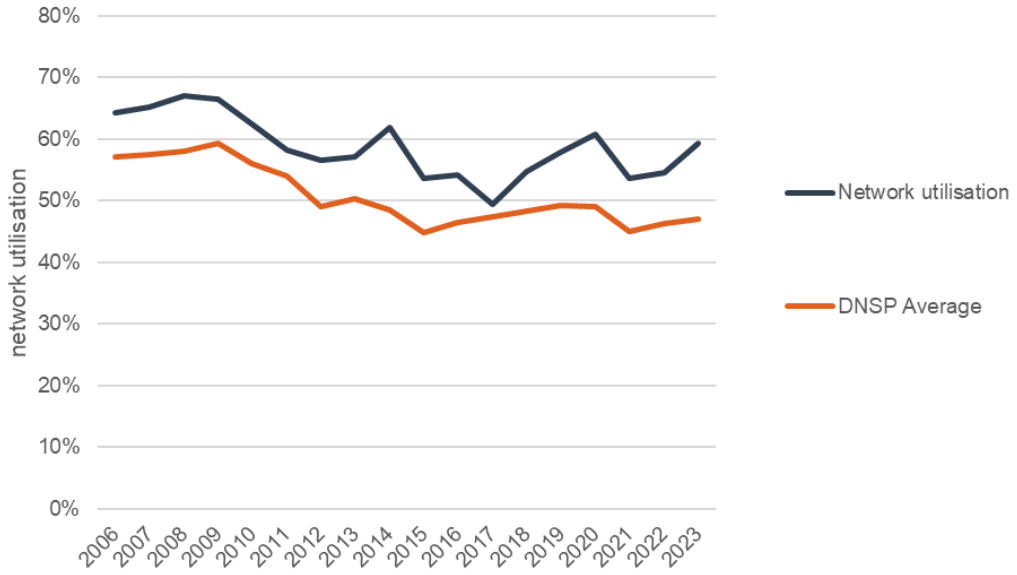
1124. We observe an increase in major non-compliances in AusNet's network relative to previous years, and when compared with the total across Victorian DNSPs.

### Network utilisation shows a slight increasing trend over the last 10 years, and remains higher than the DNSP average

1125. Network utilisation is an indicator of the capacity of the electricity network, and whilst does not account for localised constraints or complexities associated with the two-way flow of energy, is a coarse measure of the ability for networks to make greater use of the network assets.

1126. Figure C.6 shows that AusNet's network utilisation is relatively flat over the last ten years, and continues to have a network utilisation above the DNSP average.

*Figure C.6: Comparison of AusNet historical network utilisation versus DNSP average*




*Source: AER Network performance report*

# C.3 Current period expenditure performance

### Capex delivery performance is subject to a range of factors, with actual capex tracking more closely to forecast capex recently

1127. In its 2024 network performance report,[285] the AER considered the aggregate over/under-spend and the timing of capex across the regulatory period. Whilst the over/under spend in any one year may not be instructive, the AER concluded from its analysis that

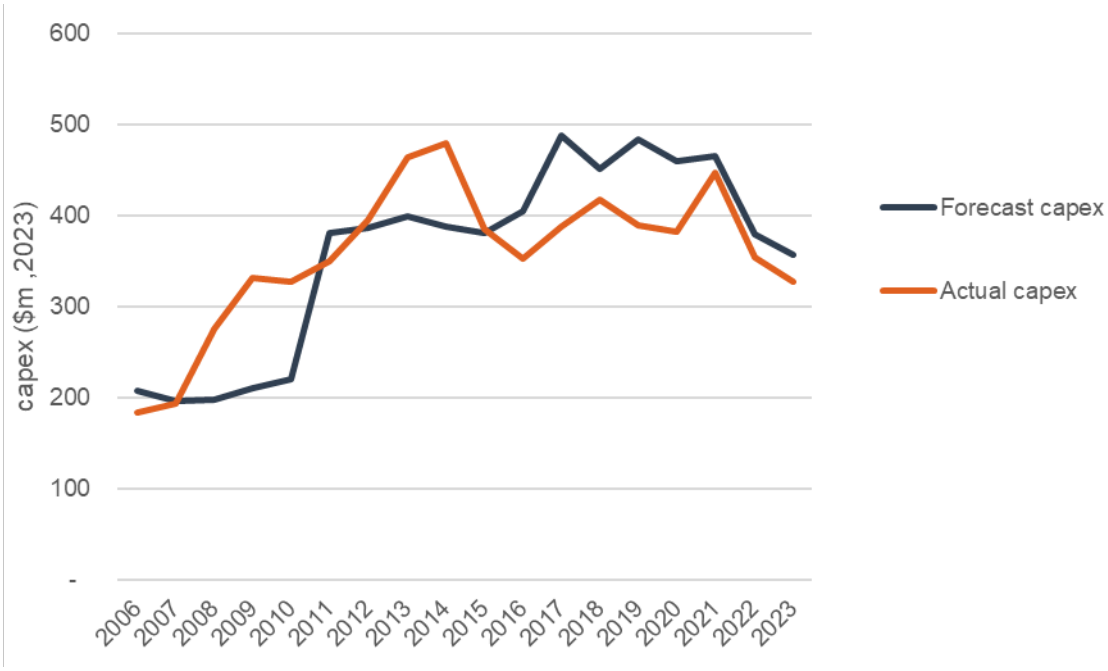
> *'Our first report looked at the timing of capex and concluded that NSPs tend to:*
> *• underspend by a greater extent early in regulatory periods*
> *• spend closer to, or above capex forecasts later in regulatory periods*
> *In our analysis we noted that there are different factors that can determine patterns of capex, and that one of the issues may be that capex incentives, financial or otherwise, vary through the course of the regulatory period.'*[286]

1128. Figure C.7 shows the forecast vs actual capex for AusNet based on the AER network performance report data. Closer analysis is required of the drivers of the capex delivery performance in any regulatory period and year to year. We make further observations as it relates to the scope of our assessment of the expenditure as relevant.

285 AER, 2024 Electricity and gas network performance report

286 AER, 2024 Electricity and gas network performance report, page 29

*Figure C.7: Comparison of AusNet historical actual with forecast capex*




*Source: AER Network performance report*

### Despite this trend, AusNet expects to overspend the capex allowance

1129. AusNet state that it expects to overspend the capex allowance in the current period by $326.9 million:

> *'..actual and expected capex in the current regulatory period is 19% above the allowance, reflecting several new drivers and the need to address new, anticipated issues not reflected in the capex allowance.'*[287]

1130. The overspend is attributed by AusNet to:

- Increasing labour and material costs due to market-driven cost pressures affecting the whole industry
- Deferral of zone substation rebuilds and some repex programs from earlier in the period
- Delays and cost increases for some REFCL compliance augex relative to the approved timing and costs
- Investments to address strong anticipated demand growth, including land purchases (not previously forecast) to accommodate new zone substations
- Overspend of connections allowance, both for load connections and unanticipated hybrid/battery connections (not previously forecast)
- Addressing unanticipated issues that have arisen over the period, including reliability issues, and
- Overspend of digital allowance to deliver Advanced Distribution Management System (ADMS) and customer platforms to improve resilience and customer experience.

### Over the last 5 years, actual opex is lower than the forecast opex resulting in a material underspend against the opex allowance

1131. In its 2024 network performance report,[288] the AER also considered totex and opex each year and across the regulatory periods:

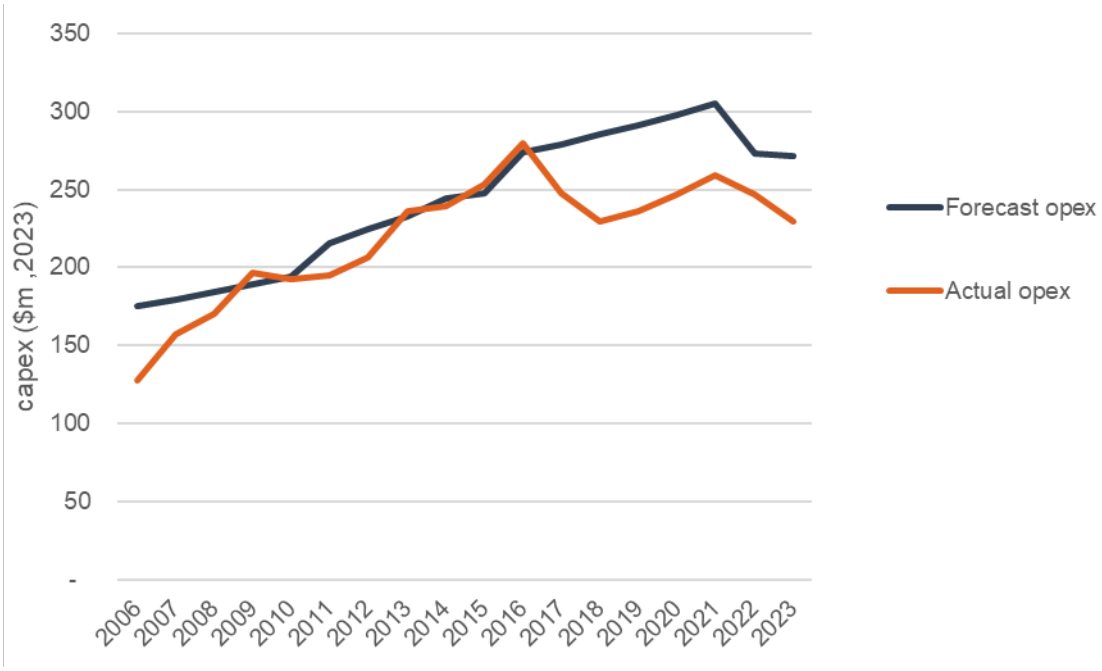
[287] Regulatory proposal page 314

[288] AER, 2024 Electricity and gas network performance report

*'There has been a cumulative underspend by NSPs of their opex allowance for 6 consecutive regulatory years, with both DNSPs and TNSPs underspending their allowance. Opex efficiency by NSPs will contribute to outperformance against their allowed returns, though it will benefit consumers through lower opex expenditure forecasts in future regulatory determinations. This is a key feature of our incentive based regulatory framework and enhances the propensity for continual improvement by NSPs in delivering better outcomes for consumers.'* [289]

1132. Figure C.8 shows a comparison of historical actual with forecast opex for AusNet. Whilst we have not been asked to consider overall opex, we observe that there has been a recent underspend of opex by AusNet consistent with the observations by the AER across NSPs.

*Figure C.8: Comparison of AusNet historical actual and forecast opex*




*Source: AER Network performance report*

[289] AER, 2024 Electricity and gas network performance report, page 29