

Powercor Revised Regulatory Proposal 2026-31

# **REVIEW OF PROPOSED LV ELECTRIFICATION AND REGIONAL AND RURAL SUPPLY EXPENDITURE**



Report prepared for:  
**AUSTRALIAN ENERGY  
REGULATOR**  
March 2026

## **Preface**

*This report has been prepared to assist the Australian Energy Regulator (AER) with its determination of a capex allowance of Powercor for the next regulatory period 2026-31. 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. This report relies on information provided to EMCa by Powercor. 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 a legal interpretation 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 by AER staff prior to 17 February 2026 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 Powercor's revised regulatory submission or other documents due to rounding.*

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Final v2

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## ABBREVIATIONS

Term	Definition
AER	Australian Energy Regulator
AMI	Advanced Metering Infrastructure
Augex	Augmentation Capex
CER	Customer Energy Resources
CPU	CitiPower, Powercor, United Energy
DSS	Distribution Sub Stations
DVMS	Dynamic Voltage Management System
EMCa	Energy Market Consulting Associates
HV	High Voltage
IR	Information Request
LV	Low Voltage
NER	National Electricity Rules
next RCP	2026-31 Regulatory Control Period
NPV	Net Present Value
P10	Demand level for which there is a 10% probability of exceedance
P50	Demand level for which there is a 50% probability of exceedance
PAL	Powercor
RCP	Regulatory Control Period
RP	Regulatory Proposal
RRP	Revised Regulatory Proposal
SWER	Single Wire Earth Return
VCR	Value of Customer Reliability

# EXECUTIVE SUMMARY

## Introduction

1. The Australian Energy Regulator (AER) has engaged EMCa (in association with Kaihen Consulting) to review and provide advice on aspects of Powercor's proposed expenditures for two projects over the 2026-31 Regulatory Control Period (next RCP) included in its Revised Regulatory Proposal (RRP). Our review is based on information that Powercor provided and on aspects of the National Electricity Rules (NER) relevant to assessment of expenditure allowances.
2. We have reviewed each of the two projects included in Powercor's forecast augmentation capex (augex). We have taken account of information provided in its RRP including associated reports and workings that Powercor has provided, together with Powercor's responses to information requests and discussions held at two 'virtual onsite' review meetings with Powercor representatives on 19 and 29 January 2026. As at the time of completing this report, we have shared the substance of our findings with AER.

## Powercor's revised proposal

Powercor's revised proposal for \$173.3m is more than it initially proposed, and which AER almost entirely disallowed in its draft decision

3. Powercor proposes a total of \$173.3 million for network expenditure to address the impacts of LV electrification across its network. Powercor proposes expenditure of \$109.1 million for LV electrification, comprising a proactive LV program, a proactive HV program and an allowance for reactive upgrades. In addition, Powercor proposes a proactive program at an allowance of \$64.2 million for upgrades to parts of its regional and rural SWER network. In aggregate, the amount that Powercor proposes in its RRP is more than it proposed in its initial Regulatory Proposal (RP).
4. In its draft decision, the AER did not accept Powercor's proposal for proactive LV or HV programs. The AER provided a lower allowance than Powercor had proposed, allowing only for a level of reactive upgrades for LV electrification and for some upgrades to its SWER network, together totalling \$17.6 million (unescalated).

## Assessment

### Customer driven electrification

There is now adequate justification for some previously disallowed expenditure, but Powercor's revised proposal for LV electrification upgrades remains significantly overstated

5. While it is reasonable to expect that Powercor will require more LV network expenditure than it has previously incurred, in order to address the impact of increasing electrification over the period, Powercor has not adequately justified the amount that it proposes.
6. New information that Powercor provides in its RRP (including explanations that it provided in response to our information requests) leads us to a view that some elements of Powercor's proposal that we considered it had not adequately justified in its initial RP, are now justified. However, elements of Powercor's proposal, particularly its proposed new proactive program, remain inadequately justified at the level that Powercor proposes. Consequently, we consider that its proposed allowance is considerably overstated.

## Regional and rural supply

Powercor's proposed allowance for regional and rural supply remains significantly overstated

7. Consistent with our finding in relation to its initial RP, we consider that there is merit in Powercor undertaking some proactive expenditure to upgrade parts of its SWER network to address the impact of electrification in rural and regional parts of its network. However, the new information that Powercor has provided in its RRP does not lead us to alter the conclusion that we formed from its initial RP, that the amount it has proposed is considerably overstated.

## Alternative forecast

Alternative forecast for LV electrification is 45% to 55% less and for regional and rural SWER upgrades 60% to 75% less than Powercor has proposed

8. We have developed alternative forecasts consistent with our findings in Sections 3 and 4, based on the new information that Powercor has provided in its models and its responses to our information requests. We consider that reasonable alternative forecasts are as follows:
  - Between 45% and 55% less than Powercor has proposed for LV electrification
  - Between 60% and 75% less than Powercor has proposed for regional and rural SWER upgrades.
9. Our central estimates for alternative forecasts are as follows:
  - \$55.9 million for LV electrification, which is 49% less than Powercor's revised proposal for \$109.1 million
  - \$20.5 million for regional and rural supply, which is 68% less than Powercor's revised proposal for \$64.2 million.
10. In both cases, based on our review of the new information that Powercor has provided, the alternative forecasts that we recommend would be greater than the AER allowed in its draft decision.

# 1 INTRODUCTION

The Australian Energy Regulator (AER) has engaged EMCa (in association with Kaihen Consulting) to review and provide advice on aspects of Powercor's proposed expenditures for two projects over the 2026-31 Regulatory Control Period (next RCP) included in its Revised Regulatory Proposal (RRP). Our review is based on information that Powercor provided and on aspects of the National Electricity Rules (NER) relevant to assessment of expenditure allowances.

We have reviewed each of the two projects included in Powercor's forecast augmentation capex (augex). We have taken account of information provided in its RRP including associated reports and workings that Powercor has provided, together with Powercor's responses to information requests and discussions held at two 'virtual onsite' review meetings with Powercor representatives on 19 and 29 January 2026. As at the time of completing this report, we have shared the substance of our findings with AER.

## 1.1 Purpose of this report

11. The purpose of this report is to provide the AER with a technical review of the selected project expenditure that Powercor has proposed in its RRP for the next RCP.
12. The assessment contained in this report is intended to assist the AER in its own analysis of the proposed expenditure allowance as an input to its Final Determination on Powercor's revenue requirements for the next RCP.

## 1.2 Scope of requested work

13. The AER's definition of the scope of the required work is reproduced in Figure 1.1.

Figure 1.1: Summary of AER's definition of the scope of required work

### Scope of work covered by this report

*EMCa to assist by reviewing the following augmentation capex revised proposals from Powercor.*

- 1. Customer Driven Electrification*
- 2. Regional Rural Supply*

14. Powercor proposed both projects in its initial Regulatory Proposal (RP) and has proposed revised amounts with revised supporting information in its RRP.

## 1.3 Our review approach

### 1.3.1 Approach overview

15. In undertaking our review, we:
  - Completed a desktop review of the information provided to us by the AER

- Assisted the AER in preparing requests for information to Powercor, and reviewed the information provided by Powercor (via the AER)
  - Undertook a Teams meeting with Powercor on 19 January 2026, in which Powercor sought to explain how its economic models worked and how it had derived its proposed expenditure requirements from those models
  - Undertook a further Teams meeting with Powercor on 29 January 2026, which provided a further opportunity to understand the approach that Powercor had undertaken, and the basis for assumptions that it had made.
16. Powercor provided the AER with responses to information requests and, where they added relevant information, these responses are referenced within this review.
17. 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

18. 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.<sup>1</sup>

### 1.3.3 Technical review

19. Our assessments comprise a technical review. While we are aware of stakeholder inputs on aspects of what Powercor has proposed, our technical assessment framework is based on engineering considerations and economics.
20. We have sought to assess Powercor's expenditure proposal based on Powercor's analysis and Powercor'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, while we have sought to test Powercor's modelling and assumptions, our review does not encompass developing separate entirely bespoke modelling or assumptions.
21. We have been provided with a range of reports, internal documents, responses to information requests and modelling in support of what Powercor 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 Powercor's RRP 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 content

22. We have included four further sections of this report:
- In Section 2, we provide an overview of the amounts that Powercor has proposed for the two programs subject to our review
  - In Section 3 we provide our assessment of Powercor's proposed LV electrification program
  - In Section 4 we provide our consideration of Powercor's proposal for proactive upgrades to parts of its regional and rural Single Wire Earth Return (SWER) network
  - In Section 5, we describe our alternative forecast and the basis on which we have derived it.

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<sup>1</sup> Including the AER's industry practice application note Asset Replacement Planning (2024).

### 1.4.2 Information sources

23. We have examined relevant documents that Powercor 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.
24. Except where specifically noted, this report was prepared based on information provided by AER staff prior to 17 February 2026 and any information provided subsequent to this time may not have been taken into account.
25. Unless otherwise stated, documents that we reference in this report are Powercor documents comprising its RRP and including the various appendices and annexures to that proposal.
26. 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

27. Expenditure is presented in this report in \$ June 2026 real terms as presented by Powercor in its revenue proposal and includes real cost escalation, unless stated otherwise.<sup>2</sup> In some cases, we have converted to this basis from information provided by the business in other terms.
28. 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.

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<sup>2</sup> Powercor's business cases are presented in \$2026 terms, but before the escalation that it applies in its SCS capex model. We annotate such costs as '\$2026 unescalated'.

## 2 SUMMARY OF POWERCOR'S REVISED REGULATORY PROPOSAL

Powercor has proposed a total of \$173.3 million for network expenditure to address the impacts of low voltage (LV) electrification across its network. Powercor proposes expenditure of \$109.1 million for LV electrification, comprising a proactive LV program, a proactive high voltage (HV) program and an allowance for reactive upgrades. In addition, Powercor proposes a proactive program at an allowance of \$64.2 million for upgrades to parts of its regional and rural SWER network. In aggregate, the amount that Powercor proposes in its RRP is more than it proposed in its initial RP.

In its draft decision, the AER did not accept Powercor's proposal for proactive LV or HV programs. AER provided a lower allowance than Powercor had proposed for reactive upgrades and for its proposed SWER program, totalling \$17.6 million (unescalated).

### 2.1 LV electrification

29. Each of the two 'project' line items that Powercor has proposed are in effect programs of work that comprise multiple individual projects. Each project is aimed at addressing a claimed increasing future prevalence of under-voltage supply that would otherwise arise from the impact of increasing customer electrification.
30. For its customer-driven electrification program, Powercor proposes a capex allowance of \$109.1 million, as shown in Table 2.1. The program comprises three initiatives:
- A proactive program in which Powercor aims to proactively address the potential for increased undervoltage supply
  - A reactive program, through which it will address instances of undervoltage supply following customer complaints
  - An 'HV clustering' program in which Powercor will selectively undertake works at the HV level to remediate undervoltage LV supply within the relevant supply zone.

Table 2.1: Proposed expenditure for customer-driven electrification program (\$m, 2026, direct escalated)

	FY27	FY28	FY29	FY30	FY31	TOTAL RCP
Proactive	12.1	15.5	14.5	17.2	12.0	71.3
Reactive	4.1	4.6	5.3	6.5	8.2	28.7
HV clustering	1.4	1.4	1.7	0.8	3.9	9.1
<b>TOTAL</b>	<b>17.6</b>	<b>21.5</b>	<b>21.5</b>	<b>24.5</b>	<b>24.0</b>	<b>109.1</b>

Source: EMCa, from PAL RRP MOD2.04 SCS capex model

## 2.2 Regional and rural SWER upgrades

31. Powercor also proposes a program to address the impact of customer electrification on supply voltage for regional and rural customers supplied by SWER feeders. Its proposed program involving expenditure of \$64.2 million, is shown in Table 2.2.<sup>3</sup>

Table 2.2: Proposed expenditure for regional and rural supply program (\$m, 2026 escalated)

	FY27	FY28	FY29	FY30	FY31	TOTAL RCP
Regional and rural supply	10.8	7.4	12.9	15.9	17.2	64.2

Source: EMCa, from PAL RRP MOD2.04 SCS capex model

## 2.3 Comparisons with Powercor's initial RP and AER's draft decision

32. As we show in Table 2.3, the amounts that Powercor has proposed are in aggregate greater than it proposed in its initial RP. In its draft decision, the AER considered that Powercor had not provided adequate justification for the majority of the amount that it had proposed and consequently determined a much smaller allowance.

Table 2.3: Summary of Powercor's initial RP, AER draft decision and Powercor RRP (\$m, 2026)<sup>4</sup>

	Initial RP	AER Draft Decision	Revised RP
<b>LV electrification</b>			
Proactive LV augmentation	63.0	-	71.2
Reactive augmentation	26.6	11.5	28.1
HV augmentation	8.9	-	8.9
Avoided augmentation from non-network solutions	-1.4	-	-1.4
<b>TOTAL LV electrification</b>	<b>97.1</b>	<b>11.5</b>	<b>106.8</b>
<b>Regional and rural supply</b>			
Regional and rural SWER upgrades	63.1	6.1	62.7
<b>TOTAL (unescalated)</b>	<b>160.2</b>	<b>17.6</b>	<b>169.5</b>

Source: EMCa, from information in PAL RRP BUS 3.3.01 (table 1) and PAL RRP BUS 3.3.02 (table 1)

<sup>3</sup> Powercor's proposed allowance for regional and rural supply is contained within a business case titled 'Regional and rural equity' (PAL RRP BUS 3.3.02). This business case also includes a 'worst served customer' program (\$14.6 million unescalated) and a stand-alone power systems' program (\$1.9 million unescalated). We have not been asked to review these two programs.

<sup>4</sup> The values here are unescalated \$2026, as presented by Powercor in its revised business cases. The lack of escalation explains why the amounts are slightly less than shown in Table 2.1 and Table 2.2 but nevertheless indicates the relative amounts on a consistent basis.

## 3 ASSESSMENT OF NEW INFORMATION ON CUSTOMER DRIVEN LV ELECTRIFICATION

While it is reasonable to expect that Powercor will require more LV network expenditure than it has previously incurred in order to address the impact of increasing electrification over the period, Powercor has not adequately justified the amount that it proposes.

New information that Powercor provides in its RRP (including explanations that it provided in response to our information requests) leads us to a view that some elements of Powercor's proposal that we considered it had not adequately justified in its initial RP, are now justified. However, elements of Powercor's RRP, particularly its proposed new proactive program, remain inadequately justified at the level that Powercor proposes. Consequently, we consider that its proposed allowance is considerably overstated.

### 3.1 Introduction

33. In this section, we provide our assessment of the new information provided by Powercor in its RRP for LV electrification.

### 3.2 Background

#### 3.2.1 Summary of Powercor's initial RP and AER draft decision

34. In its initial RP, Powercor proposed a customer-driven electrification program of \$100.6 million<sup>5</sup>, with the same three initiatives referenced above. Powercor's proposed program was based on its assessment of a deterioration in the level of voltage compliance. Absent initiatives to arrest this deterioration, Powercor forecast that its current performance of 97% compliance would decline such that by 2031 it would expect to breach the 95% Functional Compliance Limit imposed on it.<sup>6</sup>
35. The AER disallowed Powercor's proposed proactive and HV augmentation expenditure and allowed a lower level of reactive expenditure than Powercor had proposed. The AER considered that Powercor had overstated the impacts of undervoltage, including by overstating the forecast increase in the number of complaints, and that Powercor could adopt less expensive approaches to maintaining compliance including by utilising advanced metering infrastructure (AMI) data to deploy a mix of focused HV, LV, proactive and reactive interventions where and when required and through use of flexible services.
36. The AER also did not accept that in its economic modelling, Powercor had attributed the Value of Customer Reliability (VCR) as a measure of the economic cost to consumers when they receive undervoltage supply. The AER considered this to significantly overestimate the economic cost resulting from any such impacts to consumers.
37. In summary, the AER found that Powercor had not demonstrated either a compliance need or a justified economic benefit from the significant increase in expenditure that it proposed to

<sup>5</sup> Direct costs, (\$2026, escalated).

<sup>6</sup> Victorian Essential Services Commission, Electricity distribution code of practice.

address under-voltage. In its draft decision, the AER allowed an amount of \$11.9 million which was commensurate with historical average expenditure that Powercor had advised.

### 3.2.2 Powercor's RRP

38. In its RRP, Powercor:
- Reports findings from additional engagement that it has undertaken, and which it claims support its assumptions regarding the economic cost to consumers of undervoltage supply when it occurs
  - Claims limitations on the extent to which customers will be able to benefit from retail offers with 'free' electricity windows in the middle of the day
  - Incorporates updated demand forecasts into its modelling.
39. Of significant relevance to our assessment, Powercor has now based its proactive proposal on economic modelling (rather than 'compliance' modelling). In summary, Powercor derives from this modelling a forecast of claimed economic upgrades to distribution substation (DSS) and SWER assets. Powercor then deducts from this forecast the LV upgrades that are avoided (at lower cost) by its proposed HV clustering solutions and also deducts an allowance of \$1.4 million in aggregate over the five years (which is the same as in its initial RP) for assumed capex avoided because of non-network solutions.
40. Powercor's reactive forecast is derived from its updated assessment of forecast customer complaints, and the assumed rectification works that result from this.
41. Powercor's HV clustering analysis is as it originally proposed, and Powercor has provided greater evidentiary support for this program.

## 3.3 Proactive network augex modelling

### 3.3.1 Powercor's modelling of voltage impacts of electrification

#### Approach to forecasting undervoltage appears reasonable

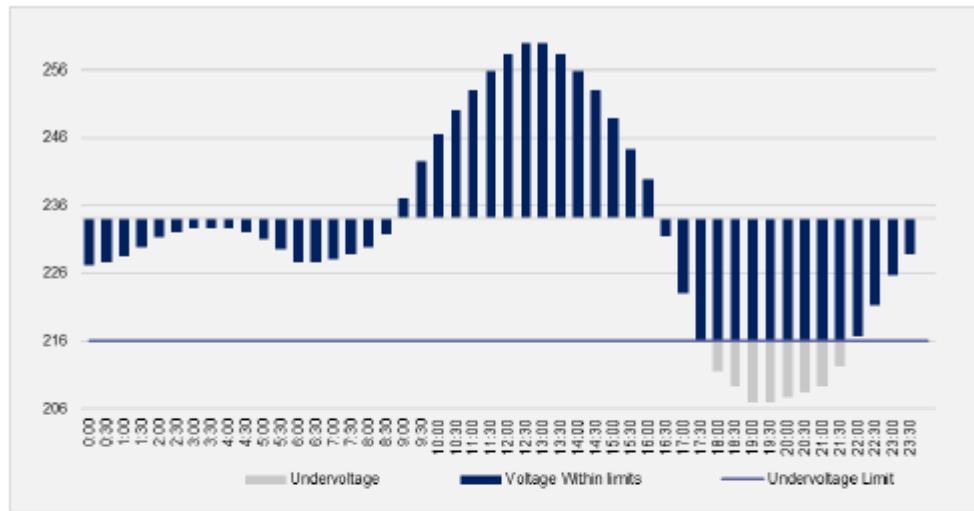
42. Powercor described the process by which it determines economic upgrades in its report on its customer electrification forecasting methodology.<sup>7</sup> We described elements of this methodology in our report on Powercor's initial RP. In summary, Powercor undertakes detailed simulation modelling at the LV level, to forecast the extent to which voltage might fall below the undervoltage threshold of 216V. It identifies such energy as 'energy at risk':

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<sup>7</sup> Customer Electrification Forecasting Methodology, PAL ATT 2.01.

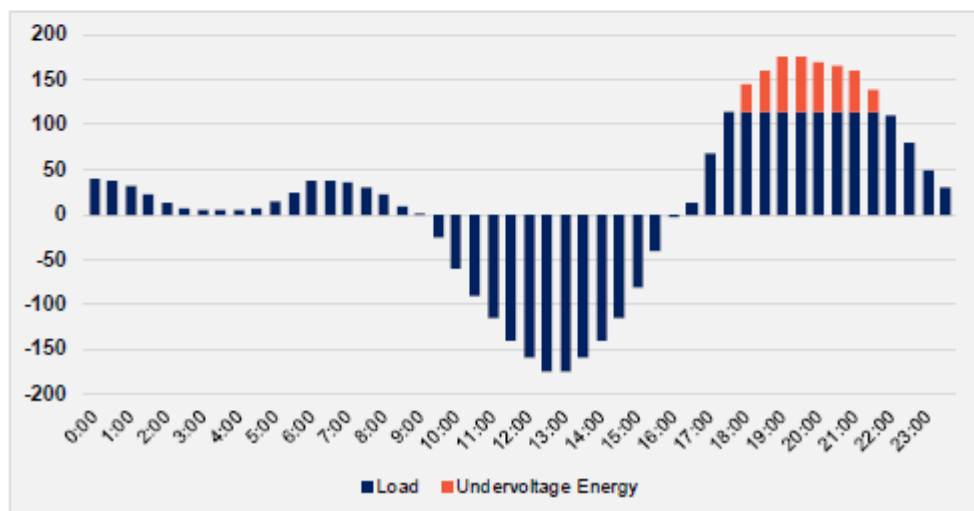
Figure 3.1: Powercor’s illustration of its modelling of voltage and resulting ‘energy at risk’

**FIGURE 18 EXAMPLE VOLTAGE FLOW (V)**



To calculate energy at risk, results are produced in kWh of load, shown in Figure 20

**FIGURE 19 EXAMPLE UNDERVOLTAGE ENERGY AT RISK (KWH)**

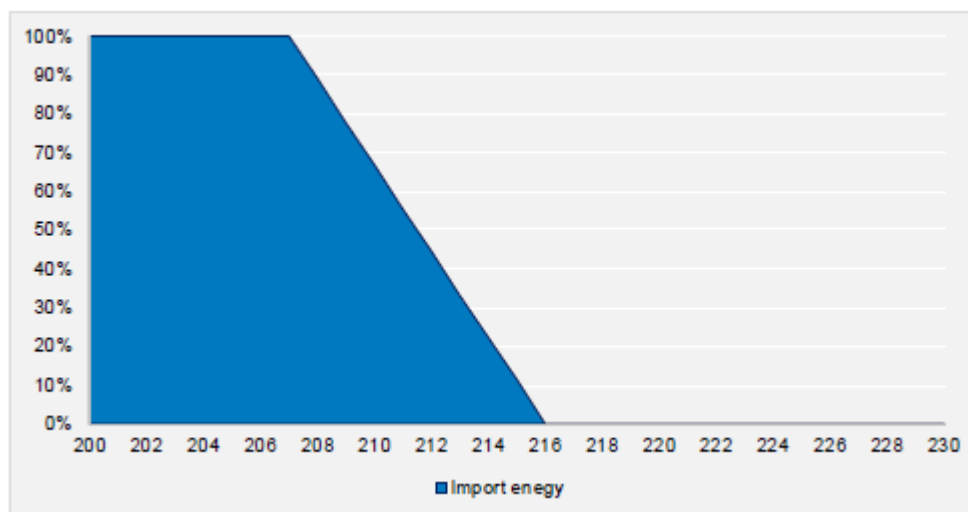


Source: PAL ATT 2.01, Figures 18 and 19

43. Powercor applies a sliding scale to such energy, as shown in Figure 3.2, to determine what it refers to as ‘energy lost to undervoltage.’

Figure 3.2: Powercor’s illustration of scaling to determine ‘energy lost to undervoltage’

This scaling is applied to the load\_undervoltage\_normal\_kwh as described in section 5.1



Source: PAL ATT 2.01, Figure 20

- 44. In its initial RP, Powercor ‘valued’ the undervoltage energy at VCR. However, we found that the primary method by which it had determined its proposed program was to avoid non-compliance. Powercor has now adopted the methodology described above to determine a claimed ‘economic’ level of proactive upgrades and has done so by now adopting a value of 10% of the VCR as the claimed measure of the economic cost of undervoltage supply.
- 45. Due to the complexity of Powercor’s LV system modelling, it is not feasible to verify the individual undervoltage forecasts that Powercor has calculated for the period from 2024 to 2035, for each of its 19,951 LV assets. However, from its description of its methodology, we consider it likely that this is a reasonable forecast.

### 3.3.2 Powercor’s economic modelling

While we initially had some queries, we are satisfied with Powercor’s explanations as to how its model works and its ‘unit cost’ assumptions

- 46. The modelling that Powercor has undertaken is relatively complex and we initially had some queries with regard to how the models worked, and cost assumptions. Powercor’s explanations helped us to understand the models, noting that there were parts of the models that were not utilised in arriving at its forecast expenditure requirement, and/or which were labelled in a way that appeared to be inconsistent with the methodology and options described. We also sought to understand the basis for Powercor’s underlying cost assumptions.
- 47. In both respects, Powercor provided satisfactory explanations through a combination of means that included explanatory meetings, presentation material and responses to information requests.

Approach to economic modelling provides an indication of an increasing need and potential to prioritise some proactive remediation and an indication of the preferred solutions

- 48. Powercor has derived claimed ‘economic upgrades’ by determining those for which the benefit (calculated using 10% of VCR to the scaled energy at risk, as above) exceeds the annuitised cost, provided that upgrade is economic before the end of the next RCP.
- 49. Powercor’s model selects from one of three options (reconductoring, DSS offload or non-network solution) based on what is referred to in the model as the highest NPV. We find that the value referred to as an NPV is in fact just the sum of (VCR-based) benefits from the time

when the 'solution' is considered to be economic, to the end of the model's analysis period (which is 2035). In principle, this may lead the model to identify a sub-optimal solution. However, Powercor applies a standard cost of \$80,000 for reconductoring and \$100,000 for DSS offload so in reality we do not consider that the lack of discounting and the relatively short assessment period would significantly affect the overall resulting capex based on its selected option at each site.<sup>8</sup>

50. Powercor's modelling identifies 923 sites that it considers warrant an economic upgrade within the next RCP at a total cost of \$80.6 million.<sup>9</sup> Of these, 92% of the solutions chosen in the model are for DSS offload, and 8% for reconductoring.
51. While Powercor's modelling incorporates a valid approach to determining the economic year in which an upgrade should be undertaken, its application of this approach relies on two critical assumptions, neither of which is particularly robust. These are as follows:
- Powercor has sought to ascribe an economic value to undervoltage and refers to values that EMCa adopted in proposing an alternative forecast in response to Powercor's initial proposal for regional and rural supply. While Powercor has sought evidence that customers place an economic value on compliant voltage, the economic value that Powercor ascribes remains as a potential 'working assumption' and is not a definitive value.<sup>10</sup> We comment further on this under the heading below, which refers to Powercor's customer survey.
  - The use of an annuitised cost in determining the economic timing necessarily requires consideration of the period over which the cost is annuitised. From inspection of its modelling, we find that Powercor has used a 'life' of 15 years for this purpose. On balance, we consider that this is a reasonable assumption; however, it is implicit in such a calculation that the 'solution' will provide a benefit that exceeds the annuitised cost over this period. Customer behaviours, available technologies and offering of non-network solutions (such as flexible load services) will increasingly influence the longer-term benefits that result from any network augmentations undertaken in the next RCP, leading to a degree of uncertainty regarding the reasonableness of the annuitisation assumption.
52. For both these assumptions, our view is that they are not unreasonable for modelling purposes, absent better information. However, both assumptions are somewhat uncertain. Because of this, we take the view that the main value in such modelling is that it provides an indicator of increasing need, also indicates that there is likely to be merit in undertaking some form of proactive program and provides some indication of likely viable solutions. Therefore, we consider it necessary to consider other aspects of the modelling outputs.

### 3.3.3 Powercor's response to seeking to value the economic cost to customers of undervoltage supply

Powercor has sought to validate an assumption regarding the economic cost to customers of undervoltage supply

53. In its RRP business case for regional and rural supply, Powercor makes the following statement:

*'We agree with the AER and EMCa that use of the full VCR may overestimate the direct value lost from electricity customers through undervoltage. However, neither the AER or*

<sup>8</sup> Powercor assumes non-network solutions at a cost of \$300,000; these solutions are not selected within the model in any instance, however as described above, Powercor deducts \$1.4 million from its proposed capex to allow for these.

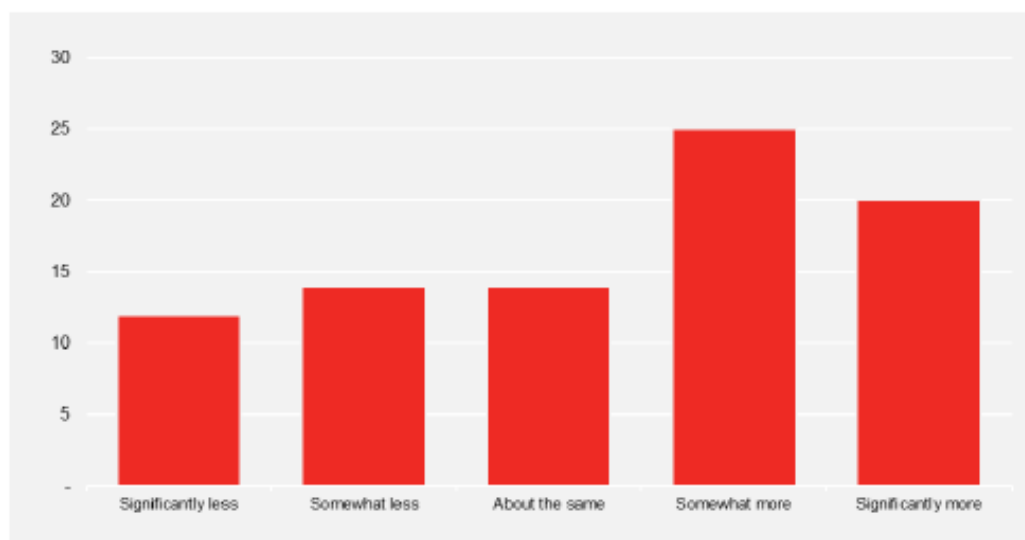
<sup>9</sup> We assume this to be in \$2026, unescalated. As above, this value is before Powercor deducts allowance of LV capex avoided by adopting HV clustering and non-network solutions.

<sup>10</sup> While EMCa adopted a value of 10% of VCR in advising the AER for its Draft Determination, we did so on the basis that: (a) we considered that the value of 100% of VCR that Powercor had used was not valid and considerably overstated the customer impact; and (b) that an alternative forecast was required for the Draft Determination and Powercor would have the opportunity to propose an evidenced value at the RRP stage. It was not EMCa's intention for the proxy value of 10% of VCR that we applied for this purpose, to become the precedent value for all such purposes.

EMCa cited any evidence to substantiate the extent to which customers value undervoltage impacts relative to a typical outage. We sought to test this with customers.<sup>11</sup>

54. We appreciate that Powercor has sought to provide such evidence. The information it has provided derives from a customer survey and, in Figure 3.3, we reproduce a summary result that Powercor reported and refers to in its submission.

Figure 3.3: Customer rating of undervoltage impacts vs an outage



Source: PAL RRP BUS 3.3.01, Figure 8, Page 16

**Powercor's survey provides useful contextual information but does little to assist with ascribing a value to consumer economic costs arising from undervoltage supply**

55. The survey that Powercor refers to was conducted with 85 customers across its three networks (Powercor, CitiPower and United Energy). Importantly, this survey was of an 85-customer sample from those that had reported undervoltage issues within the survey period (May to October 2025).<sup>12</sup> There is merit in this, in that these were customers who would then have a recollection of the issues that led them to complain.
56. The downside to this approach is that this sample is highly unrepresentative of Powercor's customer base more generally. Powercor's own information shows that a much larger number of customers are presented at some point in the year with an instance of undervoltage but do not lodge a complaint, mostly likely because they were either unaware of it or that it had no material impact for them. For example, in its modelling for FY27 for its preferred option, it projects 10,038 'non-compliant sites' but forecasts receiving only 163 customer complaints.
57. Powercor provides additional contextual information from its survey on the impacts that its surveyed customers observed. However, Powercor does not directly use its survey information to ascribe a value to undervoltage supply, nor do we consider that it would be valid to do so.

**We refer to proposing business entities to justify their assumptions**

58. For the purpose of our reviews for regulators, we look to the proposing business to substantiate any assumptions that are critical to its forecast expenditure. While EMCa adopted a value of 10% of VCR in advising the AER for its Draft Determination, we did so on the basis that: (a) we considered that the value of 100% of VCR that Powercor had used

<sup>11</sup> PAL RRP BUS 3.3.01. Page 15.

<sup>12</sup> PAL RRP BUS 3.3.02. Page 9.

was not valid as a measure of the economic cost of undervoltage supply and likely overstated the customer impact by an order of magnitude rather than just a marginal amount; and (b) that while the AER was required under the NER to provide an alternative forecast in its Draft Determination, Powercor then would have the opportunity to propose an evidenced value at the RRP stage, which it has now sought to do. It was not EMCa's intention for the proxy value of 10% of VCR that we applied for this purpose, to become the precedent value for all such purposes.

**Powercor's assumed value of 10% of VCR is not an unreasonable modelling assumption for exploratory purposes, but cannot be considered a definitive value from which to unequivocally determine an economic program**

59. While noting the information discussed above, Powercor nevertheless has adopted 10% of VCR as its assumed economic cost of undervoltage supply and therefore of the benefits of rectifying such supply. Powercor presents the basis for this as follows:

*'Specifically, we have included alternative methodologies that use 10 per cent of the AER's value of customer reliability (VCR) to determine an economic level of proactive investment. This is consistent with the approach used by the AER to determine an alternative substitute estimate for our regional and rural program (which similarly addresses undervoltage levels).*

*We remain concerned that the AER's approach will underestimate the true value our customers place on remediating undervoltage. Nonetheless, we have relied on this approach in developing our preferred option.'*<sup>13</sup>

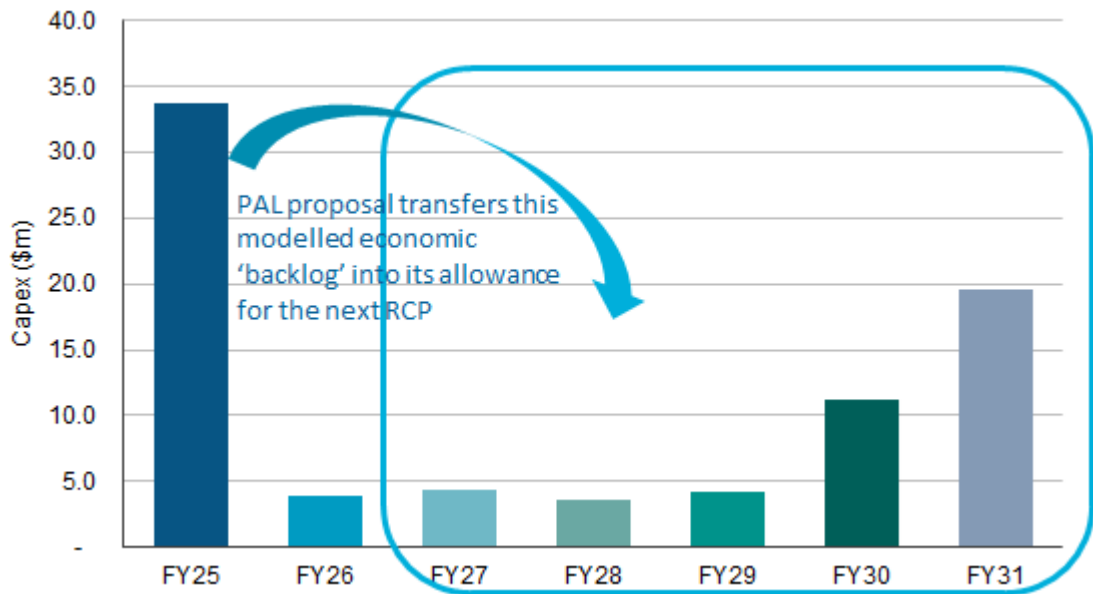
60. We consider that the value that Powercor has used is not unreasonable as an assumption to use in modelling for exploratory purposes, noting (as Powercor states) that it is the value that the AER adopted in assessing an alternative forecast for its initial RP for a regional and rural SWER upgrade program. However, in considering Powercor's modelling outputs and their relevance in supporting its proposed expenditure allowance, we consider this to be a soft assumption, albeit one that its modelling is highly sensitive to.
61. We consider this assumption to be one of several factors that lead us to consider Powercor's economic model outputs as indicative of the potential for a proactive program at some level, rather than unequivocally defining an economic program of such work. The corollary to this is that we consider that not undertaking the level of proactive work that Powercor has proposed would not necessarily be to the economic detriment of its customers.

**It is not reasonable to consider the output of Powercor's economic modelling as defining a prudent five-year program to address the impact of increasing customer electrification over the next RCP**

62. We have analysed information in Powercor's model to identify the 'optimum year' as opposed to the 'augmentation year' that results after the model 'smooths' and prioritises the program. As shown in Figure 3.4, we find that Powercor's modelling would suggest that 47% of its proposed proactive capex for the next RCP is economic before the next RCP commences. There is no obvious trend increase that could be ascribed to electrification in the first three years of the next RCP (i.e. FY27 to FY29), but the modelling does suggest a trend impact in the final two years.

<sup>13</sup> PAL RRP BUS 3.3.01. Page 3. While Powercor refers in the opening paragraph of this text to adopting this value as an 'alternative methodology', it states in the second paragraph that it has adopted this value for its preferred option, and we have confirmed through our review that this is the case.

Figure 3.4: Powercor’s proposed proactive capex, by ‘optimum year’ (\$m, 2024)



Source: EMCa analysis from Powercor model (PAL RRP MOD 3.3.01)

63. Our analysis suggests to us that the claimed economic case for a proactive program is driven significantly by Powercor’s modelling assumptions regarding the claimed economic basis for proactive remediation, but that it is only in the later years that this is driven by electrification. We consider it instructive that Powercor’s modelling (which treated FY25 as a forecast year) suggested a large program of work would have been economic before the next RCP commences and before the impacts of electrification become more pervasive.
64. We asked Powercor how much it had spent on undervoltage rectification projects in FY25, and Powercor advised an amount of \$4.7 million (\$2026).<sup>14</sup> Its’ modelling suggests that, had it adopted a proactive approach in that year, it would have ‘justified’ a program of the order of \$33.7 million rather than the \$4.7 million it actually incurred. We consider it reasonable to assume that Powercor undertook the work that it considered necessary in FY25 and that, while Powercor has not advised the amounts, it is similarly undertaking work that it considers necessary in FY26. We are not persuaded that the amounts that Powercor’s modelling would suggest should have been undertaken prior to the next RCP, represent a ‘backlog’ that needs to be allowed for in the next RCP.
65. We also observed that, for a number of the claimed economic upgrades, Powercor’s modelled benefits are either static or, in many cases, decline over the next RCP. We analysed data from Powercor’s model and found this to be the case for 274 of the 923 projects, comprising \$20 million of its proposed capex. This too indicates that, at least for these sites, an economic case, if there is one, is not driven by increasing electrification.

### 3.3.4 Conclusion

Powercor’s modelling provides a reasonable basis to assume an increasing augex requirement to address the impact of electrification, but its proposed allowance for a proactive program is significantly overstated

66. In summary, we consider that Powercor’s economic modelling provides a directional indication of a need for increased network augex to address a likely increase in undervoltage supply that will otherwise arise due to electrification over the next RCP. Moreover, we consider that its modelling may be useful in identifying potential opportunities to address these issues proactively, and to prioritise such work.

<sup>14</sup> Powercor response to IR079. Question 2(d).

67. Given the relatively short lead time required for LV projects such as Powercor envisages, and the ability (through AMI) that Powercor now has to monitor emerging issues, we expect that its program is likely to evolve dynamically as specific proactive projects are determined in ‘real time’, rather than through a long-term predictive model. While specific projects are likely to differ from those that Powercor’s modelling suggests, on balance we consider that the quantum of expenditure that its modelling suggests was economic before the start of the next RCP, is not justified, but that the quantum identified within the next RCP could be considered to provide a reasonable basis for a proactive upgrade allowance.

### 3.4 Proposed HV clustering project allowance

#### 3.4.1 What Powercor has proposed

##### AER disallowed Powercor’s initial proposal

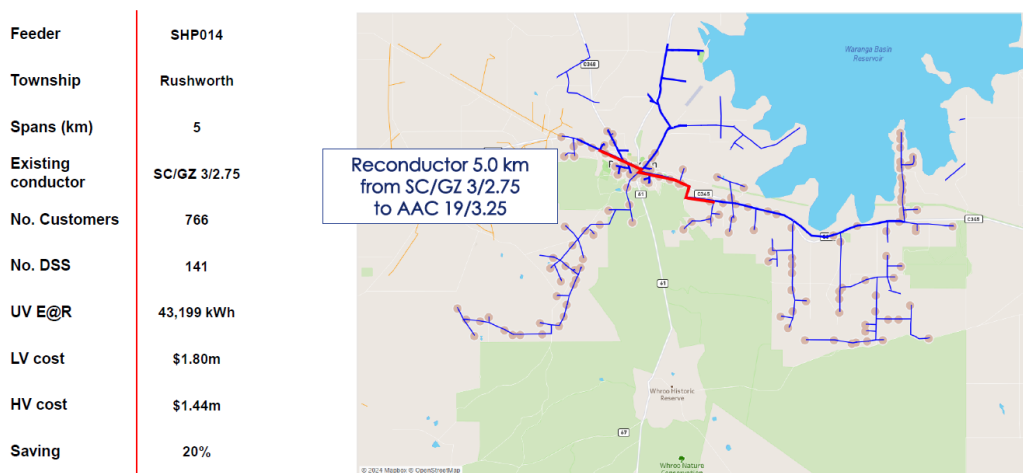
68. Powercor has re-proposed using an ‘HV clustering’ approach in which it considers that it can, in certain instances, remediate LV undervoltage in a wider area through a program at the HV level. Powercor has re-proposed an allowance of \$9.1 million.<sup>15</sup>
69. In its draft decision, AER did not allow this element of Powercor’s proposal.

##### Information that Powercor has provided

##### Powercor has provided an explanation of its workings

70. Following our request, Powercor provided an explanation of its approach at our meeting on 29 January 2026. We reproduce below two illustrations from the worked example that Powercor described at that meeting.

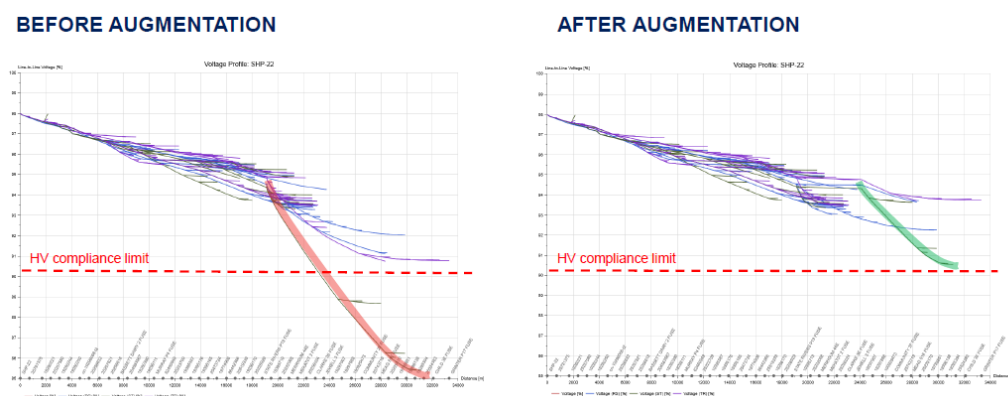
Figure 3.5: Powercor example of its assessment for an HV clustering solution



Powercor presentation to AER and EMCa, 29 January 2026, Page 10

<sup>15</sup> \$2026 escalated, from PAL SCS capex model. In Powercor’s business case, this is presented as \$8.9 million, which we presume is prior to escalation.

Figure 3.6: Powercor illustration of its analysis of voltage compliance with an HV clustering solution



Source: Powercor presentation to AER and EMCa, 29 January 2026, Page 10

71. Powercor described to us that it had identified seven specific sites where it considered it could adopt an HV clustering solution that would provide widespread benefits and would be more cost-effective than multiple LV upgrades, and that it had developed site-specific costings for each instance.
72. Powercor also explained how it had reduced its proposed proactive LV upgrade allowance by \$12.4 million in order to account for the LV work avoided by this approach. We have been able to verify these calculations.

### 3.4.2 Conclusion

#### Powercor's proposed HV clustering program is reasonable

73. With the explanations that Powercor has now provided, we consider that its allowance for some LV undervoltage to be remediated through 'HV clustering' solutions, is a cost-effective approach. We consider that its forecast allowance for this is reasonable.

## 3.5 Allowing for non-network solutions

### 3.5.1 Powercor's proposal

#### Powercor has assumed that non-network solutions will have minimal impact

74. In its Electrification and Customer Energy Resources (CER) strategy, CPU<sup>16</sup> describes how it seeks to exhaust low-cost options before undertaking high-cost network solutions. To address its forecast increase in undervoltage from electrification, Powercor has proposed an almost entirely network augmentation solution, and has assumed that non-network solutions can avoid the need for only around \$1.4 million of the otherwise proposed network expenditure of over \$100 million. In its draft decision, AER referred to the opportunity for Powercor to potentially make greater use of its ability to monitor power quality at the LV level in order to provide a more targeted approach to such augmentations when required.
75. Powercor has responded on one of the alternatives referred to in the AER's draft decision, stating that its use of distribution voltage management system (DVMS) as a solution is now saturated.
76. Powercor included community battery solutions in its options analysis but found that in all cases these were not the most economic solution.

<sup>16</sup> CitiPower, Powercor and United Energy, Initial RP.

77. Powercor concludes that:<sup>17</sup>

*... the existing evidence remains that a material proportion of LV constraints are:*

- unsuitable for non-network solutions*
- unattractive for aggregators to seek to resolve*
- unattractive to a sufficient proportion of customers on the relevant LV circuit who are engaged and have available flexible capacity to shift their load.*

### 3.5.2 Assessment

#### Powercor appears to have dismissed non-network solutions too readily

78. We consider that Powercor appears to have dismissed too readily a combination of factors that will to some extent ameliorate the undervoltage impacts of electrification. These include the rapid customer uptake of home batteries, 'zero price' power periods and other tariff signals, the option for load limitation or load control (for example of EV charging) as well as the deployment of flexible load services, though noting that Powercor does not plan to deploy these until the end of the RCP. These non-network solutions will be essentially consumer-driven and stand in addition to any 'aggregator' initiatives. Notwithstanding Powercor's report that one of these (zero price periods) can lead to new peaks, we consider that the effect of these measures will, in combination (and as is intended) work to reduce the extent to which network augmentation is otherwise required.

79. As noted in the AER's draft decision, the AMI information that Powercor now has access to provides it with great visibility at the LV level and will allow Powercor to identify and target such network augmentations as are required, based on revealed need as it arises. This will not require a high-cost five-year planned program of multiple augmentations which bears the high regret risk that a considerable number of these investments in long-lived network assets may turn out not to be required, given uncertainty over energy demand patterns in such timeframes.

### 3.5.3 Conclusion

#### While there is uncertainty over the timing and extent to which non-network solutions might reduce undervoltage issues, it is reasonable to accept Powercor's allowance

80. While Powercor has allowed only a small 'offset' for non-network solutions, we consider that there is genuine uncertainty over the net effect that a range of emerging changes in consumer usage patterns will have. Noting that Powercor will not introduce flexible services for loads until the end of the next RCP, we consider that non-network amelioration is more likely to assist beyond the next RCP. This suggests maintaining a focus on projects in the next RCP that are beneficial within a short time-frame rather than projects for which benefits are predicated on assumed long-term benefits.

## 3.6 Reactive forecast

### 3.6.1 What Powercor has proposed

#### Powercor proposes an allowance of \$28.7 million for reactive upgrades

81. In addition to proposing a proactive upgrade program, as above, Powercor has proposed a continuing allowance for reactive upgrades totalling \$28.7 million. In summary, Powercor derives this by:

<sup>17</sup> PAL RRP BUS 3.3.01. Page 20.

- Forecasting the number of annual undervoltage complaints it expects, in each year of the next RCP
  - Applying a 'conversion factor' to account for the proportion of complaints that are expected to result in an upgrade
  - Forecasting the annual cost for such upgrades, relying on an assumed proportion of 'minor' versus 'major' upgrades, each with a unit cost.<sup>18</sup>
82. In the table below, we summarise the parameters for this forecast that Powercor has provided.

Table 3.1: Powercor's proposed allowance for reactive upgrades, and its key stated assumptions (\$2026)<sup>19</sup>

	FY27	FY28	FY29	FY30	FY31	TOTAL
Forecast number of undervoltage complaints	163	171	185	212	249	980
Reactive conversion factor	33%					
Major conversion factor	34%					
Minor conversion factor	66%					
Major project cost (\$2024 '000)	113					
Minor project cost (\$2024 '000)	36					
<b>Powercor forecast reactive cost (\$m 2026)</b>	<b>4.0</b>	<b>4.5</b>	<b>5.2</b>	<b>6.4</b>	<b>7.9</b>	<b>28.1</b>

Source: PAL RRP BUS 3.3.01 (table 11), PAL ATT 2.01 (in particular, Tables 21 and 22), Powercor response to IR079 (Table 4)

**We were unable to duplicate Powercor's forecast from the information that it provided**

83. We sought to duplicate Powercor's reactive forecast utilising the information shown in Table 3.1, but were unable to do so. From Powercor's model,<sup>20</sup> its reactive upgrades forecast in \$2024 terms is \$26.9 million. Our calculation is shown in Table 3.2.

<sup>18</sup> Powercor's methodology is largely described in PAL ATT 2.01, Sections 10.2 and 13.1, with additional information confirming this methodology as provided in Powercor responses to IR075 and IR079.

<sup>19</sup> These figures are unescalated.

<sup>20</sup> PAL RRP MOD 3.3.01.

Table 3.2: Deriving reactive upgrades forecast from Powercor’s provided assumptions (\$2024)

	FY27	FY28	FY29	FY30	FY31	TOTAL
PAL forecast complaints (Option 3)	163	171	185	212	249	980
Reactive conversion factor 33%						
Implied reactive projects	54	56	61	70	82	
Major (vs Minor) projects factor 34%						
Major projects cost/project (\$k) 113						
Minor projects cost/project (\$k) 36						
Forecast major projects (#)	18	19	21	24	28	
Forecast minor projects (#)	36	37	40	46	54	
<b>TOTAL projects</b>	<b>54</b>	<b>56</b>	<b>61</b>	<b>70</b>	<b>82</b>	
Forecast major projects cost (\$m)	2.1	2.2	2.3	2.7	3.2	12.4
Forecast minor projects cost (\$m)	1.3	1.3	1.5	1.7	2.0	7.7
<b>Total reactive projects forecast (\$m)</b>	<b>3.3</b>	<b>3.5</b>	<b>3.8</b>	<b>4.4</b>	<b>5.1</b>	<b>20.1</b>
Average \$/complaint	20,519	20,519	20,519	20,519	20,519	

Source: EMCa, utilising Powercor assumptions as shown in Table 3.1

84. In its methodology description, Powercor states that: <sup>21</sup>

*‘It is also noted that the Major Conversion Factor is expected to increase over time for options in which voltage compliance degrades.’*

85. We deduce from this that, since Powercor forecasts declining voltage compliance under its preferred option, it has applied an increasing proportion of major projects through the period, though it has not provided the relevant parameters for this assumption.

**The basis for Powercor’s forecast number of complaints is not strong**

86. In its methodology document, Powercor presents an exponential formula that it had derived from historical data, for the relationship between complaints and compliance. It has used this relationship to forecast the number of complaints for each year over the next RCP, from its forecasts of the levels of undervoltage compliance for each of the options it considered. For its proposed option, Powercor forecasts a decline in compliance and therefore also forecasts an increase in complaints which in turn will require an increase in reactive auxex.

87. We sought further information as to how Powercor had derived the relationship that it has used for its forecast number of complaints. Powercor’s response includes the following statement:<sup>22</sup>

*‘For the avoidance of doubt, our complaints forecast uses actual overvoltage complaints data at historical levels of compliance to establish a relationship between voltage compliance and voltage complaints, as described in figure 32 of PAL ATT 2.01. Using equation 26 of PAL ATT 2.01, an exponential curve is fitted to the distribution of historical overvoltage complaints and used to predict future undervoltage complaints.’*

88. We had interpreted Powercor’s methodology explanation<sup>23</sup> as describing how it modelled overvoltage complaints, and we had assumed that Powercor had simply applied the same process in deriving a relationship for undervoltage complaint forecasting. While we understand that this would have been challenging with relatively little historical undervoltage

<sup>21</sup> PAL ATT 2.01. Page 57.

<sup>22</sup> Pal response to IR079, question 2(b)(i)

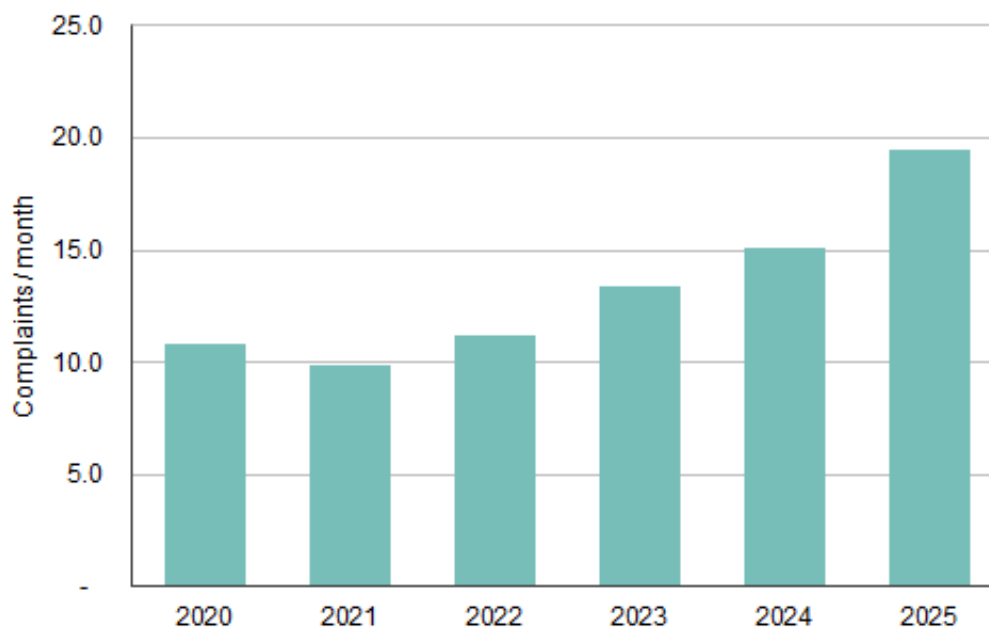
<sup>23</sup> In PAL ATT 2.01

data, Powercor's explanation introduces doubt to the extent that the relationship between overvoltage compliance and associated complaints, may differ from undervoltage. This difference could work in either direction, but Powercor's explanation exposes a potential weakness in its forecasting (and which is additional to the challenges in forecasting compliance itself).

**However, on balance we consider Powercor's forecast number of complaints is not unreasonably high**

89. We sought further information from Powercor on the historical level of complaints it has faced, and its associated reactive upgrade expenditure. We present the information that Powercor provided on the number of complaints in Figure 3.7.<sup>24</sup>
90. Powercor's data shows a clearly increasing historical volume of undervoltage complaints, which supports the directional increase that Powercor proposes. At an annualised equivalent of the order of 240 complaints in 2025 (i.e. just under 20/month), Powercor's model forecasts as shown in Table 3.2 could be considered conservatively low, though it is not possible from a single year's value to deduce whether this value is 'on trend' or is attributable to some other causal fluctuation.

Figure 3.7: Powercor historical data for number of undervoltage complaints



Source: EMCa, from information provided by Powercor in a model associated with Powercor response to IR079 response

91. On balance, we consider it reasonable to accept Powercor's forecast for the number of undervoltage complaints, noting that: (a) it's starting point does not appear to be unreasonably high; and (b) increasing electrification is likely to lead to a decline in Powercor's level of undervoltage compliance, including (as it has modelled) under scenarios in which it chooses to undertake some degree of proactive LV expenditure, and therefore that it will experience an increase in the number of complaints.

**Powercor has not justified the increase in 'costs per complaint' that are inherent in its forecast**

92. Taking Powercor's forecast number of complaints as a working assumption, we nevertheless consider that it has not justified the level of expenditure that it forecasts.

<sup>24</sup> For comparability, we present this in monthly average terms, because the data for 2020 and 2025 did not cover a full 12 months.

93. Utilising the data that Powercor has provided in its IR response,<sup>25</sup> we find that the average reactive upgrade cost per complaint was very close to \$20,000 both in FY24 and FY25. This takes account of the relationship between complaints and projects, and of major to minor projects. We also note that, in FY25, Powercor's data shows that 58% of the projects were 'major', by its definition, and which is considerably higher than the percentage of 33% that it quotes in its methodology document and which we assume was derived from data prior to FY25. While Powercor's parameters differ, however, the unit cost that we 'benchmark' from FY24 and FY25 data now provided is also very similar to that which we deduce from Powercor's methodology document, which we show in Table 3.1 and we consider this to be a reasonable value for forecasting purposes.

### 3.6.2 Conclusion

#### Powercor's forecast for reactive upgrades is overstated

94. We consider that Powercor's forecast of increasing complaints is reasonable and that this will result in an increasing number of reactive upgrades. However, we consider that its forecast is overstated as it has not justified an increase in the average cost per complaint that it has built into its proposed expenditure allowance.

## 3.7 Compliance considerations

### 3.7.1 Functional compliance requirement

95. Victorian Distribution Network Service Providers are subject to a functional compliance requirement under the Victorian Electricity Code of Practice. The compliance requirement (with regard to undervoltage) is defined as follows:

*'Functional compliance is achieved if up to one per cent of [weekly] measurements below 216V....are maintained across at least 95 per cent of a distributor's customers.'*<sup>26</sup>

96. With this definition, the value relating to 95% of customers therefore defines the threshold.

### 3.7.2 Powercor information on compliance

#### Powercor provided information on forecast functional compliance for each of the options that it considered

97. While Powercor has presented its proposal on the basis of claimed economic benefit (for the proactive program of LV augmentations and HV clustering projects) and forecast complaints (for the reactive requirement), it has also presented some high-level information on its modelling of the compliance outcome of this combination of programs.
98. We asked Powercor for more information on this and Powercor responded as per our request, with forecast compliance levels under P50 and P10 scenarios, for each of the four options that it considered and for the counterfactual 'do nothing'. Powercor provided the information that we summarise in Table 3.3.

<sup>25</sup> Power response to IR079. Question 2(d). Table 6.

<sup>26</sup> Victorian Essential Services Commission website; page on Voltage Performance Data. ((Since our focus is on undervoltage compliance, we have omitted from this quotation the equivalent reference to overvoltage)

Table 3.3: Powercor's forecast of functional compliance under each option

Scenario:	Functional compliance in:	
	FY27	FY31 <sup>27</sup>
<b>Do nothing</b>		
	P50	96.1% <b>94.6%</b>
	P10	95.3% <b>93.7%</b>
<b>Option 1: Deteriorate to functional compliance</b>		
	P50	96.1% 95.0%
	P10	95.3% <b>94.1%</b>
<b>Option 2: Maintain service level</b>		
	P50	96.8% 96.8%
	P10	96.3% 96.3%
<b>Option 3: Economic augmentation (at 10% VCR)</b>		
	P50	96.9% 96.1%
	P10	96.5% 95.7%
<b>Option 4: Economic augmentation (at 100% VCR)</b>		
	P50	97.6% 97.1%
	P10	96.3% 96.3%

Source: EMCa, from information provided by Powercor in response to IR079, Q1

It is reasonable to assume that Powercor can remain functionally compliant by focusing on the projects that its modelling indicates will be economic within the next RCP

99. We draw the following inferences from this information:

- Powercor's compliance forecast supports the need for a level of expenditure to reduce the risk that it fails to meet its functional compliance threshold on undervoltage by the end of the next RCP. 'Doing nothing' is forecast to lead to non-compliance.
- In comparing Powercor's estimates for FY27 compliance levels for Option 1 and Option 3, it appears that Powercor's compliance forecast has allowed for it to have undertaken the pre-RCP 'backlog' that we referred to in Section 3.3, as its compliance level is higher under Option 3 (by 0.8% at the P50 level<sup>28</sup>) even at the commencement of the next RCP. We consider it reasonable to assume that Powercor has commenced undertaking the work that its own assessment suggests was required, and that this will have had the effect of rescuing at least some compliance degradation relative to 'doing nothing' **prior to** the next RCP.<sup>29</sup>
- Powercor's modelling also suggests that by undertaking the further upgrades arising from increasing electrification **within** the next RCP, its functional compliance will nevertheless reduce by 0.8% (i.e. comparing Option 3 for FY27 and FY31 at the P50 level).
- It is therefore reasonable to infer that undertaking only the upgrades that Powercor's modelling suggests as being required due to increasing electrification **within** the next

<sup>27</sup> Values shown in red would breach Powercor's functional compliance obligations.

<sup>28</sup> i.e. 96.9% - 96.1%

<sup>29</sup> The analysis that Powercor provided (in its IR079 response) shows 10,038 annual non-compliant sites in FY27 for its preferred option, but 33,281 in FY27 under a 'do nothing' option. In other words, its assessment of compliance implications of the options for the next RCP commences from a different initial level of compliance indicative of having rescued approximately 23,000 non-compliant sites prior to the next RCP, but its proposed expenditure fails to take account of having done so.

RCP, will nevertheless leave Powercor with some headroom relative to a 95% compliance threshold.

100. We have also referred back to Powercor's calculations in its RP model regarding service level targets and compliance levels.
101. In its RP model, Powercor presented thresholds for the maximum numbers of non-compliant sites, being 23,366 under a 'maintain service levels' option and 37,224 under a 'reduced service levels' option.<sup>30</sup> From the compliance forecasts that it has provided in response to our more recent information request, Powercor forecasts having 10,038 non-compliant sites in FY27 (i.e. by the first year of the next RCP), and for this to rise to 15,124 by the end of the RCP (under its proposed Option 3).<sup>31</sup> This too provides an indication of the potential headroom, for example of up to 22,100<sup>32</sup> additional non-compliant sites, before Powercor would find itself breaching the relevant Code compliance threshold.
102. This information supports our view that Powercor will be able to make use of the extensive LV 'real time' information that it now has, to direct and prioritise a work program when and where required in order to maintain compliance over the period, while allowing some headroom to accommodate demand fluctuations.

### 3.7.3 Conclusion

**It is reasonable to assume that Powercor can remain functionally compliant, with a smaller but more targeted program of upgrades**

103. We consider that this provides a reasonable indication that Powercor is likely to be able to remain compliant with a lower level of augex than it has proposed. Noting that its analytical capabilities provide it with insights that reveal a highly skewed spread of benefits, we consider that Powercor would be able to prioritise projects to achieve the bulk of the benefits from a somewhat smaller program than it has proposed.

## 3.8 Summary of findings

104. While new information that Powercor has provided in its RRP (and subsequently, in responding to our information requests) leads us to a view that a reasonable allowance is somewhat greater than we recommended to AER for its draft decision, we consider that Powercor's revised proposal is nevertheless considerably overstated.
105. We summarise our findings on its LV electrification proposal as follows:
  - **Proactive LV program:** Powercor has now provided information that supports an allowance for some proactive expenditure. Powercor has now presented its case for this on economic grounds, rather than relying solely on a compliance basis as it did in its initial RP. However, our consideration of Powercor's economic analysis leads us to conclude that it overstates the amount that can be justified.
  - **HV clustering projects:** Powercor has now provided information that supports its proposed program of HV clustering to partially address LV undervoltage on a more cost-effective basis.
  - **Reactive LV upgrades:** Updated information from Powercor now supports a higher allowance for reactive LV upgrades than we were able to deduce from Powercor's previous information, though less than Powercor has proposed.
106. In Section 5 we provide our assessment of an alternative forecast that would be consistent with these findings.

<sup>30</sup> PAL MOD 3.31. Tab 'Service level targets'.

<sup>31</sup> Powercor response to IR079. Table 4.

<sup>32</sup> 37,224 – 15,124

## 4 ASSESSMENT OF NEW INFORMATION ON REGIONAL AND RURAL SWER UPGRADES

Consistent with our finding in relation to its initial RP, we consider that there is merit in Powercor undertaking some proactive expenditure to upgrade parts of its SWER network to address the impact of electrification in rural and regional parts of its network. However, the new information that Powercor has provided in its RRP does not lead us to alter the conclusion that we formed from its initial RP, that the amount it has proposed is considerably overstated.

### 4.1 Introduction

107. In this section we provide our assessment of Powercor's revised regulatory proposal for regional and rural SWER upgrades.

### 4.2 Background

#### 4.2.1 Powercor's initial proposal and summary of AER draft decision

108. As we showed in Table 2.2, Powercor proposed an allowance of \$63.1 million for regional and rural supply upgrades, against which the AER's Draft Determination provided an allowance of \$6.1 million.
109. Powercor proposed its initial RP allowance based on economic modelling that sought to upgrade all projects that met an economic threshold, which it calculated by assuming that customers suffered an economic cost equal to VCR, for supplies below the threshold voltage. The AER did not accept this and considered the forecast to be overstated.
110. In order to provide for an alternative forecast, the AER adopted a value of 10% of VCR as a proxy value for the benefits of remediating undervoltage supply. We note that this adjustment method effectively maintained Powercor's prioritisation of projects, leaving intact those projects that had the greatest benefit to cost ratios.

#### 4.2.2 What Powercor has proposed

111. In its RRP, Powercor has proposed an allowance of \$64.2 million (\$2026, escalated)<sup>33</sup> for regional and rural supply upgrades, which are to its SWER network. Powercor has presented information from customer surveys that it claims support this program and has now calculated its forecast of 'economic' upgrades using a value of 30% of the VCR to represent the economic cost to consumers of undervoltage supply.
112. In other respects, Powercor's approach to forecasting what it considers to be an economic level of SWER upgrades is substantially the same as the approach that it applied in its initial RP.

<sup>33</sup> In its business case (PAL RRP BUS 3.3.02, table 1) Powercor presents this as \$62.7 million in \$2026. This is the value prior to escalation, which Powercor undertakes in its SCS capex model.

## 4.3 Assessment

### Powercor has sought to validate how it quantifies the economic benefits of SWER upgrades

113. As we described in Section 3.3, Powercor has surveyed its customers in seeking to provide evidence in its RRP to support its assumptions regarding the value of the economic costs to customers of undervoltage supply. As we state in that section, while this provides some contextual information, Powercor does not rely on this survey information to directly derive a value for this parameter, nor do we consider that it would be valid to do so.
114. Powercor also describes how it surveyed customers specifically on their willingness to pay for a SWER to 3-phase upgrade program. From this survey, Powercor claims that 72% of residential respondents were prepared to pay a higher bill to allow this program. Powercor notes that 71% of 'greater Melbourne' customers were prepared to pay for this, even though it is regional and rural SWER customers that would benefit from it.
115. Powercor states that less than half of customers preferred the 'status quo.'

### Powercor's survey results provide contextual information but are not instructive in determining an appropriate value for undervoltage supply

116. It is unclear from Powercor's information whether the survey results regarding willingness to pay for SWER upgrades are the same as the more general survey results that we described and consider in Section 3.3.<sup>34</sup> If this is the case, then we consider it suffers from the same limitations that we describe in that section when it comes to supporting a specific assumption for the value ascribed to undervoltage supply.
117. We also observe that, in response to our IR, Powercor advised that its survey included only one SWER customer.<sup>35</sup> While this is 'proportionate' with regard to representing Powercor, CitiPower and United Energy customers overall, it does not allow for any statistically valid conclusions to be drawn with regard to the impact to SWER customers themselves.

### Powercor has not supported ascribing a much higher value to the cost of undervoltage for SWER customers, than for non-SWER customers.

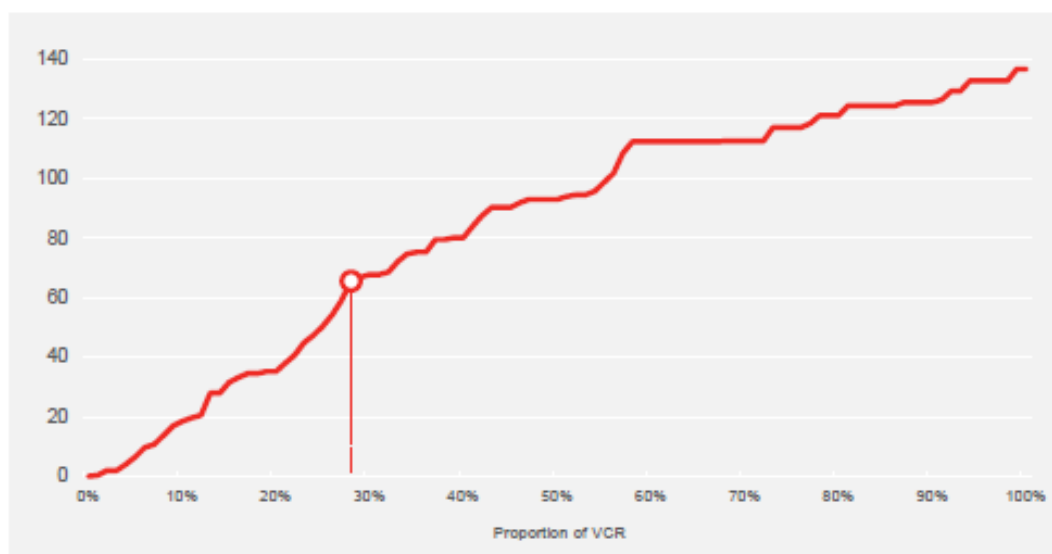
118. In its RRP, Powercor states:<sup>36</sup>
- '...our preferred option remains consistent with the level of our original investment forecasts. Under our revised proposal demand forecasts, this option is consistent with a VCR weighting of less than 30 per cent.'*
119. Powercor also provides a diagram in which it shows sensitivity analysis on this assumption, and which we reproduce as Figure 4.1.

<sup>34</sup> In responding to our IR074 Question 2 on regional and rural upgrades, which explicitly referred to the '85 person' survey, Powercor appears to suggest that its responses on regional and rural SWER upgrades are derived from the same survey.

<sup>35</sup> PAL response to IR074. Question 2.

<sup>36</sup> PAL RRP BUS 3.3.02. Page 13.

Figure 4.1: Economic SWER upgrades based on VCR sensitivity analysis (\$2026)



Source: PAL RRP BUS 3.3.02, Figure 3

120. We asked Powercor to explain its rationale for adopting a '10%VCR' risk-cost assumption for non-SWER customers and a '30%VCR' value for its SWER customers. Powercor responded as follows:<sup>37</sup>

*'While we considered alternative options, including the use of 10 per cent of the VCR, this resulted in an investment program below what our customers have consistently and emphatically supported during our engagement. In addition, 72 per cent of customers in response to our undervoltage survey shared that undervoltage impacts were equal to or worse than an outage, indicating that 30 per cent of the VCR is not unreasonable.'*

121. We do not consider this to be a valid justification; to the extent that Powercor wishes to rely on an economic justification, we see no evidence to support use of a value for its SWER customers that is three times greater than for its non-SWER customers.
122. We consider it relevant also that Powercor appears to have placed weight almost exclusively on claimed customer support for its proposed program and has essentially 'back solved' the implied economic value.

### Conclusion

**Powercor's proposed regional and rural SWER upgrade program is considerable overstated**

123. We have described what we consider to be limitations in inferring that the particular survey that Powercor describes demonstrates that its proposed investment program is justified. However, the scope of our assessment is to consider the technical engineering / economic justification and, from this perspective, the evidence that Powercor has provided does not support the level of program that Powercor has proposed.
124. Based on the scope of our review, we consider that Powercor's proposed regional and rural SWER upgrade program is considerably overstated.

## 4.4 Summary of finding

125. While new information that Powercor has provided in its RRP (and subsequently, in responding to our information requests) leads us to a view that a reasonable allowance is

<sup>37</sup> Powercor response to IR074. Question 1.

somewhat greater than we recommended to the AER for its draft decision, we consider that Powercor's revised proposal is nevertheless considerably overstated.

126. We summarise our finding as follows:

- **Regional and rural SWER upgrades:** Powercor has re-proposed essentially the same amount as in its initial RP for regional and rural SWER upgrades. However, for essentially the same reasons that we stated in our report on its initial RP, we remain of the view that this considerably overstates a justified allowance.

127. In Section 5 we provide our assessment of an alternative forecast that would be consistent with these findings.

## 5 IMPLICATIONS FOR THE ASPECTS OF EXPENDITURE WE HAVE BEEN ASKED TO REVIEW

We have developed alternative forecasts consistent with our findings in Sections 3 and 4, based on the new information that Powercor has provided in its models and its responses to our information requests. We consider that reasonable alternative forecasts are:

- between 45% and 55% less than Powercor has proposed for LV electrification, and
- between 60% and 75% less than Powercor has proposed for regional and rural SWER upgrades.

Our central estimates for alternative forecasts are as follows:

- \$55.9 million for LV electrification, which is 49% less than Powercor's revised proposal for \$109.1 million
- \$20.5 million for regional and rural supply, which is 68% less than Powercor's revised proposal for \$64.2 million.

In both cases, based on our review of the new information that Powercor has provided, the alternative forecasts that we recommend would be greater than the AER allowed in its draft decision.

### 5.1 LV electrification

#### 5.1.1 Proactive HV clustering upgrades

Powercor's forecast for HV clustering is reasonable

128. Consistent with our findings, we consider it is reasonable to include Powercor's proposed allowance for HV clustering in an alternative forecast.

#### 5.1.2 Proactive LV upgrades

Alternative forecast for proactive LV upgrades is considerably less than Powercor has proposed

129. We consider that a reasonable basis for an alternative forecast is to allow for those proactive upgrades for which Powercor's model: (a) indicates the 'optimum year' is within the next RCP; and (b) reveal an increasing 'benefit' consistent with addressing its forecast of increasing undervoltage.
130. Consistent with Powercor's forecast, an alternative forecast for proactive LV upgrades would net off its allowance for such upgrades that are resolved by HV clustering and by non-network flexible services.

### 5.1.3 Reactive upgrades

Alternative forecast for reactive upgrades is based on Powercor's forecast number of complaints, but without an increasing cost to resolve each complaint

131. As we described in Section 3.6 we consider that Powercor has provided a reasonable forecast of the level of reactive complaints that it can expect over the period. However, Powercor has not justified an increase in the cost to address each complaint, which is inherent in its forecast. We consider that a reasonable alternative basis for this is the costs (per complaint) derived from information that Powercor provided for FY24 and FY25.

### 5.1.4 Alternative forecast for LV electrification

Alternative forecast is 45% to 55% less than Powercor has proposed

132. We derive a central estimate alternative forecast for Powercor's allowance for LV electrification of \$55.9 million. This is \$53.2 million (49%) less than Powercor's revised proposal for \$109.1 million, but more than the AER's allowance of \$11.5 million in its draft decision.
133. We consider that a reasonable allowance range would lie between \$50 million and \$60 million, being approximately 45% to 55% less than Powercor has proposed.

## 5.2 Regional and rural supply

Alternative forecast is 60% to 75% less than Powercor has proposed and is based on adopting the same VCR value as Powercor has adopted for LV electrification

134. We consider that a reasonable basis for an alternative forecast for Powercor's upgrades to its regional and rural SWER network, is to apply the same VCR-based assumption as Powercor adopted for its LV electrification modelling, and which is also the proxy value that the AER adopted in its draft decision. As we state in Section 3.3.3, we consider it is not unreasonable to adopt this value, absent alternative evidence.
135. From this assumption, we derive a central estimate alternative forecast for Powercor's allowance for regional and rural supply of \$20.5 million from Powercor's model. This is \$43.7 million (68%) less than Powercor's revised proposal for \$64.2 million, but more than the AER's allowance of \$6.1 million in its draft decision.
136. We consider that a reasonable allowance range would lie between \$15 million and \$25 million, being approximately 60% to 75% less than Powercor has proposed.

## 5.3 Commentary on alternative forecast

While we consider that the alternative forecast is reasonable in aggregate, we expect that the component programs are likely to vary from the basis for Powercor's forecast and our proposed alternative forecast

137. While we have 'built up' our alternative forecast from the components by which Powercor had proposed it, we consider that an appropriate interpretation of this forecast is that the aggregate amount is a reasonable overall allowance to enable Powercor to address LV electrification and regional and rural SWER network impacts. We consider it unlikely that Powercor will find that its modelling justifies the specific program of works that is currently indicated.
138. We consider it likely that Powercor will find that the balance between LV proactive, LV reactive and HV clustering solutions will vary from these amounts. We expect that Powercor will continue to monitor data on LV voltage levels, consumer behaviours and

usage patterns, deployment of behind the meter technologies and the ways in which consumers operate them and that this information will assist in defining and undertaking a prudent suite of programs over the period, including evolving non-network options.

139. We expect that Powercor may also further consider the balance between its regional and rural SWER expenditure and its non-SWER LV electrification requirements.