

Values of Customer Reliability Methodology

Draft determination

March 2024

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Submissions and procedure change requests

Invitation for submissions

Interested parties are invited to make submissions on this draft determination by **23 April 2024**.

Submissions should be sent to: VCR2024@aer.gov.au. Alternatively, submissions can be sent to:

Stephanie Jolly
Executive General Manager, Consumers, Policy and Markets
Australian Energy Regulator
GPO Box 3131
Canberra ACT 2601

Submissions should be in PDF, Microsoft Word or another text readable document format.

We prefer that all views and comments be publicly available to facilitate an informed and transparent consultative process. Views and comments will be treated as public documents unless otherwise requested. Parties wishing to submit confidential information should:

- clearly identify the information that is the subject of the confidentiality claim
- provide a non-confidential version of the submission in a form suitable for publication.

All non-confidential information will be placed on our website. For further information on our use and disclosure of information provided to us, see *ACCC/AER Information Policy* (June 2014).

Consultation procedure change request

Our formal consultation commences with the publication of this draft determination, consistent with the expedited rules consultation procedure in the National Electricity Rules (NER).¹

If you consider our proposed changes to the VCR methodology are not a Non-material Proposal,² you can request that we use the standard rules consultation procedure instead of the expedited rules consultation procedure. This request must be in writing and sent to the email or postal address provided above by **9 April 2024**. It must also include the reasons why you consider our proposed changes are not a Non-material Proposal.

If we receive a request to use the standard rules consultation procedure, we will consider the reasons given in the request and decide whether we still assess the proposed changes to the VCR methodology to be a Non-material Proposal. We will, as soon as practicable, publish the request, notice of our decision and the reasons for our decision. Changing to the

¹ See r 8.9.3 of the NER for information on the expedited rules consultation procedure and r 8.9.2 of the NER for more information on the standard rules consultation procedure.

² Non-material Proposal means a Proposal that, if implemented, will be unlikely to have a significant effect on the NEM or on the activities of the Registered Participants to which the Proposal relates (r 8.9.1(a) of the NER).

standard rules consultation procedure is likely to result in the updated VCR being published later than if the expedited rules consultation procedure is used (but still by our statutory deadline of 18 December 2024).

Public forum

Stakeholder engagement is a valuable input to our review. We encourage interested stakeholders to join us at an online public forum on **4 April 2024**. Details of how to register for this forum are available on our website.

We will also provide regular stakeholder updates on our website and via email. We encourage interested stakeholders to subscribe to the AER website or join our email distribution list to stay up to date with our VCR review.

1 Executive Summary

This draft determination sets out the Values of Customer Reliability (VCR) methodology we propose to use to update the VCR for standard outages (these are unplanned outages with a duration of up to 12 hours) in 2024.

VCR seek to reflect the value different types of customers place on reliable electricity supply under different conditions and are usually expressed in dollars per kilowatt hour (\$/kWh) of unserved energy. VCR play an important role in ensuring customers pay no more than necessary for safe and reliable energy, helping energy businesses identify the right level of investment to deliver reliable energy services to customers.

VCR for standard outages are important as they can be applied to VCR uses we have identified in most circumstances.³ Most outages customers experience in the National Electricity Market (NEM) and the Northern Territory originate in distribution networks.⁴ The majority of these outages are less than 12 hours in duration and typically relate to powerline damage caused by lightning, car accidents, debris such as falling branches, and animals. Consequently, the standard outage VCR have a wide application, including as an input for cost-benefit assessments, such as those applied in regulatory tests that assess network investment proposals.

In 2019, we developed the VCR methodology for standard outages, following extensive consultation and quality assurance, and calculated the VCR using that methodology. We must update the VCR by 18 December 2024, and we must review the 2019 VCR methodology prior to updating the VCR.⁵ After we review the methodology, we are required to publish an updated methodology or a notice stating that the existing VCR methodology has not been varied as a result of the review.

Our draft determination on the VCR methodology (draft determination) commences our formal consultation under the NER. It sets out the updated VCR methodology for standard outages (by way of proposed changes to the 2019 VCR methodology), the reasons for the updated VCR methodology and the reasons for considering the proposed changes to the VCR methodology are a Non-material Proposal.

We consider the VCR methodology we developed in 2019⁶ remains fit for purpose and covers the main uses of the VCR. We propose to use that methodology with minor amendments including:

- removing the reference to the specific nominal dollar value for the maximum willingness to pay in the residential customer survey

³ See section 3.2 for more information on the identified uses of VCR.

⁴ Around 95% of the interruptions to supply experienced by electricity customers are due to issues in the local distribution network. See AEMC, *Final report – 2019 annual market performance review*, AEMC, 12 March 2020, p. 51.

⁵ NER, r 8.12.

⁶ As set out in AER, *AER Statement of Methodology for determining Values of Customer Reliability*, AER, 2020.

- updating the cost prompts and bill discounts in the residential customer survey to account for inflation impacts and changes in consumer preferences since our last VCR review
- clarifying that when we update the VCR, we may revise the cost prompts and bill discounts in the residential and business customer surveys to account for inflation impacts and changes in consumer preferences since our last VCR review
- refining some text and footnotes to improve clarity, correct minor typographical errors, remove detail specific to the 2019 VCR methodology and make references easier to identify going forward.

We have minimised changes to the VCR methodology as much as is practicable to enable greater comparability between the 2019 VCR and the 2024 VCR to see how customer views on reliability might change over time.

1.1 Next steps

After the consultation period ends, we will consider submissions and any issues raised by stakeholders during consultation. We will then finalise the updated VCR methodology, which we are required to publish in a final determination by 5 June 2024 under the expedited rules consultation procedure. The updated VCR methodology will come into effect when our final determination on the VCR methodology is published (5 June 2024) and we will use it to update the VCR. We must update the VCR by 18 December 2024.

1.2 Other outages and values of resilience

We do not currently compute \$/kWh VCR for some outage types (such as planned outages, repeated outages, that is several outages occurring in a row, etc.). Some forms of outage – including prolonged and/or widespread outages – are relatively rare but may have a significant impact on the affected energy consumers and the economy more broadly. Most of them, except for the widespread outages up to 12 hours in duration, fall outside of the scope of this VCR methodology.⁷

Analysing many of these outage types presents some challenges including with data availability and changing patterns of occurrence. For example, changing technology as we transition to net zero and the potential impacts of climate change may lead to the emergence of new outage patterns and weather-related outages. For these reasons it is important that we develop our understanding of outages which fall outside the scope of the standard VCR. The recent storm-related outages in Queensland (December 2023-January 2024) and Victoria (February 2024), where some customers experienced prolonged outages, highlight the importance of this work.

We have commenced additional work exploring these types of outages, concurrent with our 2024 VCR review for standard outages. There are two dimensions to this additional work:

- valuing prolonged outages and other high impact low probability events – we will undertake work on valuing customer resilience consistent with the Energy and Climate

⁷ While widespread outages up to 12 hours are included in the VCR methodology, we do not produce a \$/kWh value for these outages due to data availability issues.

Change Ministerial Council’s request that we extend our current review of the VCR to establish a value of customer resilience associated with outages over 12 hours.⁸ We will also undertake other work related to the analysis of high impact, low probability (HILP) outages.⁹

- reliability events related to the wholesale energy market – we are interested to understand whether new types of outages due to wholesale market reliability events may emerge in the future with higher penetration of wind and solar. We are working with the Reliability Panel and the AEMC as they explore these types of wholesale energy market outages – more information on this work is provided in chapter 6.

We are progressing the VCR for standard outages, which has a statutory deadline for completion by 18 December 2024, in parallel to the additional work identified above.

⁸ Energy and Climate Change Ministerial Council, *Meeting communique – 1 March 2024*, Energy and Climate Change Ministerial Council, 2024 (accessed 8 March 2024).

⁹ HILP outages refer to outages which fall outside the standard outages included in the VCR. These do not occur often but may have a high impact when they do occur and may be widespread and / or prolonged.

2 Background

2.1 About values of customer reliability

VCR seek to reflect the value different types of customers place on reliable electricity supply under different conditions and are usually expressed in dollars per kilowatt hour (\$/kWh) of unserved energy. VCR play an important role in ensuring customers pay no more than necessary for safe and reliable energy and promoting an efficient level of investment to deliver reliable energy services to customers.

Since individual customers cannot directly specify the value they place on reliability and there is no separate market for reliability, VCR are difficult to observe directly and must be estimated. VCR are a collection of numerical values which cover different customer segments including residential, business and very large business customers.

2.2 Timing for the 2024 review

We developed our initial VCR methodology in 2019. As part of that project, we carried out the largest VCR study ever conducted in Australia with over 9 000 residential, small business and industrial energy customers completing our survey. We also undertook extensive consultation and quality assurance on our VCR methodology.¹⁰ We are now commencing our 2024 review because we must review the VCR methodology and update the VCR at least once every five years.¹¹

The 2024 review has two streams of work:

- reviewing the VCR methodology
- updating the VCR.

The focus of this draft determination is on reviewing the 2019 VCR methodology. We are reviewing the VCR methodology first so any revisions arising from the review can be incorporated into the methodology used to calculate updated VCR. The indicative timings for each stream are set out below.

¹⁰ Our final report on VCR values was published on 18 December 2019, and set out the VCR for unplanned outages of up to 12 hours in duration (i.e., standard outages) for the NEM and the Northern Territory. Information from the 2019 VCR review is available at www.aer.gov.au.

¹¹ See r 8.12 of the NER.

VCR methodology review timing



VCR update timing



Note: Timing is indicative and may change.

2.3 Consultation

The publication of this draft determination on the VCR methodology commences our formal consultation under the NER. We are using the expedited rules consultation procedure for our consultation, which applies to Non-material Proposals.¹² We consider our proposed amendments to the 2019 VCR methodology constitute a ‘Non-material Proposal’ because they are limited to:

- updating nominal dollar values in the stated preference surveys for the impacts of inflation and changes in consumer preferences
- amending the statement of methodology to clarify that the dollar value parameters may be adjusted for inflation, changes in consumer preferences and changes in the set of available backup technologies when we update the VCR in the future
- refining some text and footnotes to improve clarity, correct minor typographical errors, remove detail specific to the 2019 VCR methodology and make references easier to identify going forward

and, therefore, will be unlikely to impact significantly on the National Electricity Market (NEM) or the activities of Registered Participants to which the VCR methodology relates.

Prior to the commencement of the formal consultation under the NER, we issued an information notice which provided background on our review and informed stakeholders of our thinking, next steps and intention to use the expedited rules consultation procedure. We also contacted a range of stakeholders to inform them of our review, including the Australian Energy Market Operator (AEMO), jurisdictional regulators, participants in our 2019

¹² See r 8.9 of the NER. This rule sets out three approaches to consultation: standard, expedited and minor rules consultation procedures.

development of the VCR methodology, and other stakeholders we think might have an interest in our VCR methodology.

We have also met with the Reliability Panel, the Australian Energy Market Commission (AEMC), AEMO, Energy Users Association of Australia (EUAA), multiple network businesses and the Victorian Department of Energy, Environment and Climate Action.

3 VCR Framework

3.1 The VCR rule

The framework for the development of the VCR methodology and the publication of VCR is set out in rule 8.12 of the NER.

Consistent with that rule, we must, in accordance with the Rules consultation procedures, review the VCR methodology every five years prior to updating the VCR. Following that review, we must publish an updated VCR methodology or a notice stating the existing methodology was not varied because of the review.

We must also ensure:

- the VCR methodology and any VCR calculated in accordance with that methodology are consistent with the VCR objective
- the VCR methodology includes mechanisms for directly engaging with retail customers and customers (other than retailers), which may include the use of surveys, and for adjusting the VCR on an annual basis.

The VCR objective

The VCR methodology and VCR should be fit for purpose for any current or potential uses of VCR that the AER considers to be relevant.¹³

3.2 Current and potential uses of the VCR

We have reviewed the use of the VCR in the NEM and Northern Territory and identified the following current and potential uses:

- input into cost benefit analysis for network planning (such as regulatory investment tests and integrated system plans) and the assessment of future network expenditure for capital projects
- setting transmission and distribution reliability standards and targets¹⁴
- informing reviews of the wholesale market reliability standard and settings¹⁵
- informing reviews of the system restart standard¹⁶
- informing reliability and emergency reserve trader procurement¹⁷

¹³ NER, r 8.12(a).

¹⁴ For example, see Independent Pricing and Regulatory Tribunal (IPART), *Electricity transmission reliability standards*, IPART, 2016, accessed 12 December 2023.

¹⁵ NER, r 3.9.3A(e)(4).

¹⁶ VCR were an input into the Reliability Panel's 2020 System Restart Review. See <https://www.aemc.gov.au/market-reviews-advice/review-system-restart-standard-2020> (accessed 12 December 2023).

¹⁷ See NER, r 3.20.2(b).

- informing the assessment of requests to declare certain risks as protected events¹⁸
- as the key measure for linking outcome performance with service target performance incentive schemes incentives.¹⁹

3.3 Considerations for our review

In undertaking our review of the VCR methodology, we must have regard to the requirements of the VCR rule (see section 3.1). We will need to consider whether the updated VCR methodology and any VCR calculated using that methodology are consistent with the VCR objective.

We must also have regard to the National Electricity Objective (NEO).²⁰ In particular, we will need to consider whether the updated VCR methodology is consistent with the NEO following the amendment to the NEO in 2023 which added an emissions reduction objective.

The NEO

To promote efficient investment in, and efficient operation and use of, electricity services for the long term interests of consumers of electricity with respect to:

- a. price, quality, safety, reliability and security of supply of electricity; and*
- b. the reliability, safety and security of the national electricity system; and*
- c. the achievement of targets set by a participating jurisdiction—*
 - i. for reducing Australia's greenhouse gas emissions; or*
 - ii. that are likely to contribute to reducing Australia's greenhouse gas emissions.*

¹⁸ For example, AEMO's November 2018 request for declaration of a protected event regarding a risk to South Australia's power system. See <https://www.aemc.gov.au/market-reviews-advice/request-declaration-protected-event-november-2018> (accessed 12 December 2024).

¹⁹ See AER, *Electricity distribution network service providers – Service target performance incentive scheme* (version 2.0), AER, 2018.

²⁰ NEL, ss 7 and 16(1)(a).

4 VCR methodology

This chapter sets out our draft decision on the VCR methodology we will use to calculate the updated VCR.

4.1 Proposed amendments to the VCR methodology

We have reviewed the VCR methodology²¹ and consider it remains fit for purpose. We therefore propose using that methodology, with minor amendments, to update the VCR. Our reasons for this decision are set out in chapter 5 of this determination.

The minor amendments we propose making to the VCR methodology are:

- removing the reference to the specific nominal dollar value for the maximum willingness to pay in the residential customer survey
- updating the cost prompts and bill discounts in the residential customer survey to account for inflation impacts and changes in consumer preferences since our last VCR review
- clarifying that when we update the VCR, we may revise the cost prompts and bill discounts in the residential and business customer surveys to account for inflation impacts and changes in consumer preferences since our last VCR review
- refining some text and footnotes to improve clarity, correct minor typographical errors, remove detail specific to the 2019 VCR methodology and make references easier to identify going forward.

The updated VCR methodology, with proposed changes marked up (in red), is set out in tables 4.1 to 4.3 below.

Table 4.1 Methodology for standard outages

| Standard outages | |
|------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Residential and business customers with a peak demand less than 10 MVA | <p>Stated preference surveys using combined contingent valuation and choice experiment techniques.</p> <p><i>Contingent valuation</i></p> <p>The contingent valuation technique asks the respondent two closed questions followed by one open-ended question about their willingness to pay (WTP) to avoid two unexpected power outages a year (the baseline scenario) affecting either the home of a residential customer or the specified place of business of a business customer.</p> <p>Each unexpected outage in the baseline scenario occurs on a different random weekday in winter, lasts for one hour in off-peak times and only affects the local area.</p> |

²¹ As set out in AER, *AER Statement of Methodology for determining Values of Customer Reliability*, AER, 2020.

| Standard outages | |
|------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| | <p>The closed questions <u>will</u> present a respondent with a bill increase of \$x and ask the respondent to indicate (YES or NO) as to whether they would be willing to pay the \$x bill increase to fund network investment and avoid the baseline scenario.</p> <p>The bill increase of \$x for the first closed question is randomly selected. The second closed question <u>cost prompt</u> is double the first cost prompt if the respondent answers YES to the first question and is half the first cost prompt if the respondent answers NO to the first question.</p> <p>The initial cost prompts for residential customers are the following monthly bill increase amounts: \$2, \$3, \$4, \$5, \$6, \$7, \$8, and \$9, \$10 and \$11.</p> <p>The initial cost prompts for business customers are the following monthly bill increase amounts: 1%, 2%, 3%, 4%, 5%, 6%, 7%, 8%, 9% and 10%.</p> <p><u>When we update the VCR at the end of each 5-year period, we will review the cost prompts and may change them to account for inflation impacts and changes in consumer preferences since our last review.</u></p> <p>The open-ended question following the closed questions asks respondents to indicate the maximum bill increase they would be willing to pay to avoid the baseline scenario.</p> <p>Responses to the open-ended question are capped. For residential customers the cap is \$22 per month set at, which is the approximate cost of a backup power system which can supply a household for the duration of the baseline scenario²². Where a respondent enters a value more than the cap, they will be asked a follow up question as to whether they would be willing to pay \$22 per month the cap amount to install the described backup power system. <u>If they answer YES, then the cap amount is used for them.</u> If the respondent answers NO, they will then be presented with an open-ended question asking them how much they would be willing to pay to install the described backup power system. <u>This value is used to a maximum of the cap amount.</u></p> <p>For business customers the cap is equal to 100 percent of their indicated electricity bill.</p> <p><i>Choice experiment</i></p> <p>The choice experiment technique asks customers to identify their most preferred option out of a series of choices with different outage characteristics such as duration, severity (widespread / localised), time of day, time of week and time of year they occur in. The trade-offs customers make in choosing between options with different characteristics are used to determine the relative value respondents place on each of these attributes.</p> |

²² ~~Appendix 4 of our draft decision discusses how we set the cap of \$22 per month.~~

| Standard outages | |
|-------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| | <p>The choice experiment technique <u>will</u> presents respondents with eight different sets of three hypothetical outage scenarios that and ask respondents to select their preferred outage scenario in each set. Each outage scenario includes a specified bill discount which a customer would receive if they chose to accept the outage scenario.</p> <p>Each set of outage scenarios contains the baseline scenario with no bill discount. The other two scenarios in each set are variations of the baseline scenario with changes to the severity (level) of one or more attributes (characteristics) of the outage. The attributes and levels tested in the choice experiment are:</p> <ul style="list-style-type: none"> • Outage duration: 1 hour, 3 hours, 6 hours and 12 hours • Geographic impact: 'localised' and 'widespread' • Time of day: Peak time and Off-peak time • Season: Summer or Winter • Day of the week: Weekday or Weekend • Bill discount (residential): no change, \$3-4 per month, \$7-8 per month and \$15-18 per month. • Bill discount (business): no change, 1%, 2% and 3%. • <u>When we update the VCR at the end of each five-year period, we will review the discounts and may adjust them to account for inflation impacts, changes in consumer preferences, or for changes in back-up generation technologies and costs since our last review.</u> |
| <p>Business customers with peak demand equal or greater than 10 MVA</p> | <p><i>Direct cost survey</i></p> <p>The direct cost survey asks respondents to outline and quantify the actual costs they expect to incur from an unplanned outage affecting their identified business site. There are two versions of the survey - one for business sites with continuous 24/7 operations and one for business sites with non-continuous operations.</p> <p>For customers with continuous 24/7 operations, respondents are asked to outline and quantify the costs they would expect to incur in an unplanned outage of the following durations: 10 minutes, 1 hour, 3 hours, 6 hours, 12 hours, 24 hours and 48 hours.</p> <p>For customers with non-continuous operations, respondents are asked to outline and quantify the costs they would expect to incur for:</p> <ul style="list-style-type: none"> • unplanned outages that start at peak times (between 7am and 10am, or 5pm and 8pm on a weekday) for the following durations: 10 minutes, 1 hour, 3 hours and 6 hours • unplanned outages that occur at off-peak times (anytime except between 7am and 10am or 5pm and 8pm), on a weekday for the following durations: 10 minutes, 1 hour, 3 hours and 6 hours • unplanned outages that start at any time and have the following durations: 12 hours, 24 hours and 48 hours. |

Table 4.2 Methodology for annual adjustment mechanism

| Annual adjustment mechanism |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p>Published values will be adjusted on an annual basis using a CPI-X approach, where X is set to zero. This ensures that in economic terms, real values of VCR are maintained between VCR reviews.</p> <p>Due to the lack of available information on what the key drivers of changes in customer reliability preferences are and how they affect VCR, X is set to zero. The AER will periodically review whether X should continue to be set at zero. The AER welcomes further discussions with stakeholders on how real changes in VCR could be monitored annually, prior to the next review.</p> <p>To measure CPI changes we will apply the annual percentage change in use the Australian Bureau of Statistics' (ABS) consumer price index (CPI) series 'Index Numbers; All groups CPI; Australia' all groups, weighted average of eight capital cities, for the four quarters preceding the most recently reported figure.²³</p> <p><u>For each interim year between five-yearly VCR reviews, CPI adjusted VCR are calculated using the following method:</u></p> $VCR_t = \frac{CPI_t}{CPI_{t-1}} \times VCR_{t-1}$ <p><u>Where:</u></p> <p><u>VCR_t (VCR_{t-1}) = Value of Customer Reliability for year t ($t-1$)</u></p> <p><u>CPI_t = most recent index value of the ABS All Groups CPI; Australia available at the time of the CPI adjustment</u></p> <p><u>CPI_{t-1} = most recent index value of the ABS All Groups CPI; Australia available at the time when VCR_{t-1} was calculated</u></p> <p><u>For example, if 2024 VCR were last updated in December 2024, then for the annual adjustments in December 2025, t is 2025, CPI_{2025} is the index value for September 2025 and CPI_{2024} is the index value for September 2024; for the December 2026 annual adjustment, CPI_{2026} is the index value for September 2026 and CPI_{2025} is the index value for September 2025; and so on.</u></p> <p>For example, to publish annual adjustments in December, we will use the reported CPI figures for the four quarters preceding September, which are the most recently reported figures available.</p> <p>ΔCPI_t is the annual percentage change in the ABS CPI All Groups, Weighted Average of Eight Capital Cities²⁴ from the September quarter in regulatory year $t-2$ to the September quarter in regulatory year $t-1$, calculated using the following method:</p> <p>The ABS CPI All Groups, Weighted Average of Eight Capital Cities for the September quarter in regulatory year $t-1$</p> <p>divided by</p> <p>The ABS CPI All Groups, Weighted Average of Eight Capital Cities for the September quarter in regulatory year $t-2$</p> |

²³ ABS, Catalogue series ID: A2325846C, catalogue number 6401.0, Consumer price index, Australia. If the ABS does not or ceases to publish the index, then CPI will mean an index which the AER considers is the best available alternative index. We note this measure is consistent with our approach to indexation employed elsewhere by the AER, for example to index network business' regulatory asset bases.

²⁴ ~~If the ABS does not or ceases to publish the index, then CPI will mean an index which the AER considers is the best available alternative index.~~

Annual adjustment mechanism

~~minus one.~~

~~For example, for the 2021 regulatory year, t-2 is September quarter 2019 and t-1 is September quarter 2020; and for the 2022 regulatory year, t-2 is September quarter 2019 and t-1 is September quarter 2020 and so on.~~

Table 4.3 Methodology for converting VCR survey results into dollars per kilowatt hour (\$/kWh) VCR values and aggregating values

| Converting VCR survey results into dollars per kilowatt hour (\$/kWh) VCR values and aggregating values | |
|----------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Deriving \$/kWh standard outage VCR for each residential segment | <p>For each residential customer segment, the contingent valuation and choice experiment results are combined to produce a dollar value for a range of outage scenarios relevant for customers in that segment.</p> <p>To convert into \$/kWh values, the dollar value are <u>is</u> divided by an estimate of the consumption which <u>an average</u> residential customer would have consumed over the period had the outage not occurred. This estimate is based on residential consumption data obtained from one or more of the following sources:</p> <ul style="list-style-type: none"> • the residential survey • network business data, or • other available sources (actual or estimated) of residential consumption data. <p>An aggregate \$/kWh for each residential cohort is derived by summing the probability-weighted \$/kWh VCR of each outage scenario. The probability for each outage scenario is based on estimates derived from historical network outage data.</p> |
| Deriving \$/kWh standard outage VCR for each business segment with a peak demand of less than 10 MVA | <p>The contingent valuation and choice experiment results for each business segment are in % of bill terms. These results are converted to dollar terms using estimates of business customer bills. Different bill assumptions may be used to account for consumption size and/or business sector.</p> <p>The dollar contingent valuation and choice experiment results are combined to produce a dollar value for a range of outage scenarios relevant for customers in that segment.</p> <p>To convert into \$/kWh values, the dollar value is divided by an estimate of the consumption which <u>an average</u> business customer would have consumed over the period had the outage not occurred. This estimate is <u>will</u> be based on business consumption data obtained from:</p> <ul style="list-style-type: none"> • the business survey • network business data, or • other sources (actual or estimated) of business consumption data. <p>An aggregate \$/kWh for each business cohort is <u>will</u> be derived by summing the probability-weighted \$/kWh VCR of each outage scenario.</p> |

| Converting VCR survey results into dollars per kilowatt hour (\$/kWh) VCR values and aggregating values | |
|--------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| | <p>The probability for each outage is based on estimates derived from historical network outage data.</p> |
| <p>Deriving \$/kWh standard outage VCR for business customers with peak demand greater than or equal to 10 MVA</p> | <p>The responses from the direct cost survey produce a dollar value for the outage scenarios asked in the survey.</p> <p>To convert into \$/kWh vales-values, the dollar value for each outage is converted using energy consumption data obtained from the direct cost survey.</p> <p>An aggregate \$/kWh for each business customer is obtained by summing the probability-weighted \$/kWh VCR of each outage scenario. The probability for each outage is based on estimates derived from historical network outage data.</p> <p>The aggregate \$/kWh for each response is load-weighted with other direct cost survey responses, on the basis of based on industry or sector groupings, to produce a combined industry or sector \$/kWh VCR.</p> |
| <p>Aggregating VCRs</p> | <p>Aggregate VCRs for a particular area or region are derived by load-weighting the relevant aggregate residential and business cohort VCRs (including combined aggregate industry or sector \$/kWh VCRs for business customers with peak demand of greater than or equal to 10 MVA).</p> |

5 Reasons for draft decision

5.1 Proposed amendments

We have made minor amendments to the existing VCR methodology because:

- the costs prompts and bill discounts in the residential customer survey are nominal values and need to be revised to account for the impacts of inflation; they may also need to be revisited to account for the changes of consumer preferences over time
- the maximum willingness to pay cap in the residential customer survey is a nominal value based on back-up technology available at the time and needs to be revised to account for changes in available backup power systems and their costs
- the proposed amendments will help ‘future proof’ the VCR methodology by allowing us to update the residential and business customer survey questionnaire so that it reflects the changes in inflation, consumer preferences and technology that have occurred since we last updated the VCR
- some text and footnotes were unclear or contained minor typographical errors or detail specific to the 2019 VCR methodology. The proposed amendments to these sections will improve clarity, correct the errors and make references easier to identify going forward.

5.2 Consistency with the VCR objective

Under Rule 8.12 of the NER, the VCR methodology, and any VCR calculated in accordance with that methodology, should be fit for purpose for any current or potential uses of VCR that AER considers to be relevant (VCR objective).²⁵

As part of our review, we have identified a range of current and potential uses of VCR that we consider to be relevant (see section 3.2). For the following reasons, we consider that the updated VCR methodology set out in chapter 4, and any VCR calculated in accordance with that methodology, will be fit for purpose for those uses:

- the proposed amendments to the 2019 VCR methodology outlined in section 4.1 are minor and aim to make the updated methodology more responsive to future changes in inflation, customer preferences, and backup power system technologies and their costs
- the updated methodology will continue to produce estimates of VCR that are a reasonable reflection of customer reliability preferences, accounting for a range of different customer cohorts and geographic locations across the NEM and Northern Territory and recognise the various uses of VCR
- the updated VCR methodology will continue to offer flexibility and granularity with respect to the variables being measured / targeted, such as customer types, outage types (duration, temporal differentiation), location (jurisdiction, and further by CBD, urban, rural, remote) and therefore, the derived VCR values are able to be applied to the VCR uses we identified in most circumstances.

²⁵ NER, rr 8.12(e) and 8.12(a).

5.3 Consistency with the National Electricity Objective

In undertaking our review of the VCR methodology, we have applied the NEO. The NEO promotes efficient investment in, and efficient operation and use of, electricity services for the long-term interests of consumers of electricity, taking into consideration price, quality, safety, security, reliability and emission reductions. We have particularly focussed on the price and reliability elements of the NEO in this work because the VCR seek to reflect the value different types of customers place on reliable electricity supply under different conditions and play an important role in ensuring customers pay no more than necessary for safe and reliable energy.

We consider the updated VCR methodology will promote the long-term interests of electricity customers by enabling businesses, regulators and other stakeholders to make informed decisions about the efficiency of proposed investments in electricity services. This is because the updated methodology:

- will produce estimates of VCR that are a reasonable reflection of customer reliability preferences. These values will help decision-makers to balance reliability and affordability when making decisions about investment and/or reliability framework(s)
- is flexible and can be adjusted to reflect future changes in reliability preferences, including due to changes in the energy market, cost, technology, or consumer perceptions
- offers greater scope, granularity, and flexibility than alternative approaches in terms of the variables being targeted, such as customer types, outage types and location. This allows for more targeted VCR being developed for particular uses.

5.4 Requirements of Rule 8.12(d)

We consider the updated VCR methodology meets the requirements of rule 8.12(d) of the NER because it:

- uses surveys of residential, business and large business customers (see table 4.1). It therefore has a mechanism for directly engaging and seeking information from a range of customers and geographic locations within the NEM and Northern Territory
- has a mechanism for adjusting VCR values on an annual basis using a CPI-X approach (see table 4.2). CPI is used to ensure the real VCR values are maintained. X represents the annual change in customer reliability preferences, which may be influenced by factors such as technological changes.

In respect of the annual adjustment mechanism, we continue setting X to zero due to the lack of strong evidence in support of feasible alternatives. We consider these difficulties are likely to remain an impediment to calculating a non-zero X in future years, but we will revisit this issue in future VCR reviews if required.

5.5 Consideration of alternative VCR methodologies

In developing the VCR methodology in 2019, we indicated we would consider alternative methodologies in our next VCR methodology review. Consistent with that commitment, we have revisited alternative methodologies for calculating VCR including revealed preference and model-based approaches.

We prefer the survey-based VCR methodology over alternative methodologies because:

- The VCR values derived using survey approaches can be applied to most uses of VCR we have identified.
- Contingent valuation and choice experiment survey techniques can capture both the tangible effects on customers due to an interruption in their electricity supply, as well as intangible effects such as loss of comfort.²⁶
- Surveys can better ascertain information about how customer perceptions of grid reliability change because of solar PV, battery storage and other emerging technologies.
- Survey-based approaches, particularly choice experiments, offer greater flexibility and granularity than model-based approaches with respect to the variables being measured / targeted, such as customer types, outage types and location.²⁷ This allows for more targeted VCR being developed for particular uses.
- There are difficulties with using alternative methodologies, including data, methodological and timing constraints.²⁸

We also note that switching to a different methodology would increase the potential for changes in VCR which are not a result of changes in customer preferences. As a key use of VCR is to inform long-term investment decisions, we consider it is preferable to maintain regulatory consistency with respect to the VCR methodology when the existing methodology remains fit for purpose.

²⁶ Macmillan, Wilson, Baik, Carvallo, Dubey and Holland, *Shedding light on the economic costs of long-duration power outages – A review of resilience assessment methods and strategies*, Lawrence Berkeley National Laboratory, 2023.

²⁷ Sullivan, Collins, Schellenberg and Larsen, *Estimating power system interruption costs – A guidebook for electric utilities*, Berkeley National Laboratory, 2018.

²⁸ These difficulties were identified in 2019 (see section 3.3.1.1 of AER, *Values of customer reliability – final decision*, AER, 2020 and Melbourne Energy Institute, *Estimating values of customer reliability using revealed preference approaches*, Melbourne Energy Institute, 2019) and remain applicable in our current review.

6 Related matters

The Reliability Panel is responsible for monitoring, reviewing and reporting on the reliability of the national electricity system. One of the key responsibilities of the Reliability Panel is setting the form and level of the reliability standard.²⁹

The reliability standard is a central component of the reliability framework underpinning the wholesale electricity market (generation). It seeks to send a signal about reliability to guide decisions of participants in the wholesale electricity market, while also balancing the trade-off between reliability and affordability (the higher the reliability standard, the higher the cost for customers).³⁰

The Reliability Panel is undertaking a review of the form of the reliability standard and the administered price cap.³¹ The Reliability Panel has undertaken modelling to better understand how the reliability risk profile could change as the NEM transitions to a system with higher penetration of variable renewable energy resources. It has indicated that it would be useful to understand how customers may value the new reliability outcomes in this context as it progresses its work on the form of the standard.³² The Reliability Panel also noted that it would be ideal if the AER could reflect the new information on unserved energy events from the Reliability Panel's modelling by including additional questions in AER's VCR survey.³³

When we developed the VCR methodology in 2019, we were open to exploratory questions about outages that were not part of the VCR methodology. For example, we included questions on momentary outages in our residential and business surveys. While there is generally a trade-off between survey's length and response rate, we remain open to the prospect of including other, exploratory questions in our surveys.

Consistent with this approach, we have agreed to add questions to our residential and business surveys which explores a scenario of interest to the Reliability Panel. The scenario involves a sequence of one-hour outages repeated over a period of time. The question was developed by the AEMC staff and approved by the Reliability Panel and the responses will be analysed by the AEMC.

We are also open to other exploratory questions. In particular, we consider the direct cost survey provides a good opportunity to explore how large electricity users value longer

²⁹ The form of the reliability standard is currently based on expected unserved energy and is set at a level of 0.002 percent expected unserved energy.

³⁰ For more information, see [https://www.aemc.gov.au/energy-system/electricity/electricity-system/reliability#:~:text=What%20is%20the%20Reliability%20Standard,Energy%20Market%20Operator%20\(AEMO\)](https://www.aemc.gov.au/energy-system/electricity/electricity-system/reliability#:~:text=What%20is%20the%20Reliability%20Standard,Energy%20Market%20Operator%20(AEMO)) (accessed 8 February 2024).

³¹ See <https://www.aemc.gov.au/market-reviews-advice/review-form-reliability-standard-and-apc>.

³² AEMC, *Review of the form of the reliability standard and administered price cap*, AEMC, 2023, accessed 4 December 2023.

³³ AEMC, *Review of the form of the reliability standard and administered price cap*, AEMC, 2023, accessed 4 December 2023.

duration outages. This survey already covers outages up to 48 hours³⁴ and we may add questions to it which explore longer duration outages (over 48 hours).

³⁴ While outages up to 48 hours are included in the direct cost survey, we do not produce a \$/kWh value for these outages for outages which are longer than 12 hours.

Glossary

| Term | Definition |
|----------|-------------------------------------|
| ABS | Australian Bureau of Statistics |
| AEMC | Australian Energy Market Commission |
| AEMO | Australian Energy Market Operator |
| AER | Australian Energy Regulator |
| CBD | central business district |
| CPI | Consumer Price Index |
| HILP | high impact low probability |
| NEM | National Electricity Market |
| NEO | National Electricity Objective |
| NER | National Electricity Rules |
| Solar PV | solar photovoltaic |
| USE | Unserved energy |
| VCR | Value(s) of customer reliability |
| WTP | Willingness to pay |
| \$/kWh | Dollars per kilowatt hour |