

Values of customer reliability

Statement of methodology

August 2024

© Commonwealth of Australia 2024

This work is copyright. In addition to any use permitted under the *Copyright Act 1968* all material contained within this work is provided under a Creative Commons Attributions 4.0 Australia licence except for:

- the Commonwealth Coat of Arms
- the ACCC and AER logos
- any illustration diagram, photograph or graphic over which the Australian Competition and Consumer Commission does not hold copyright, but which may be part of or contained within this publication.

The details of the relevant licence conditions are available on the Creative Commons website as is the full legal code for the CC BY 4.0 AU licence.

Important notice

The information in this publication is for general guidance only. It does not constitute legal or other professional advice. You should seek legal advice or other professional advice in relation to your particular circumstances.

The AER has made every reasonable effort to provide current and accurate information, but it does not warrant or make any guarantees about the accuracy, currency or completeness of information in this publication.

Parties who wish to re-publish or otherwise use the information in this publication should check the information for currency and accuracy prior to publication.

Inquiries about this publication should be addressed to:

Australian Energy Regulator
GPO Box 3131
Canberra ACT 2601
Email: aerinquiry@aer.gov.au
Tel: 1300 585 165

AER reference: 17150555

Contents

Methodology	4
Glossary	9

Methodology

This document sets out our methodology to calculate values of customer reliability (VCR) for unplanned outages for standard outages with a typical duration equal to or less than 12 hours.

The VCR methodology is set out in Tables 1.1 to 1.3 below. It is also published on the AER website in chapter 4 of our *VCR methodology final determination*. This document serves as a standalone statement of the final methodology.

Table 1.1 Methodology for standard outages

Methodology step	Description
<p>Willingness to pay for residential and business customers with peak demand less than 10 MVA</p>	<p>Stated preference surveys using combined contingent valuation and choice experiment techniques.</p> <p>Contingent valuation</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> <p>The closed questions will 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 cost prompt 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, \$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>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.</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 set at the approximate cost of a backup power system which can supply a household for the duration of the baseline</p>

Methodology step	Description
	<p>scenario. 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 the cap amount to install the described backup power system. If they answer YES, then the cap amount is used for them. 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. This value is used to a maximum of the cap amount.</p> <p>For business customers the cap is equal to 100 percent of their indicated electricity bill.</p> <p>Choice experiment</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> <p>The choice experiment technique will present respondents with eight different sets of three hypothetical outage scenarios 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 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, \$4 per month, \$8 per month and \$18 per month. • Bill discount (business): no change, 1%, 2% and 3%. • 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.
<p>Willingness to pay for business customers with peak demand equal or greater than 10 MVA</p>	<p>Direct cost survey</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 -</p>

Methodology step	Description
	<p>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, and 12 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 duration of 12 hours

Table 1.2 Methodology for annual adjustment mechanism

Annual adjustment mechanism
<p>Published values will be adjusted on an annual basis by CPI. This ensures that in economic terms, real values of VCR are maintained between VCR reviews.</p> <p>To measure CPI changes we will use the Australian Bureau of Statistics' (ABS) consumer price index (CPI) series '<i>Index Numbers; All groups CPI; Australia</i>'.¹</p> <p>For each interim year between five-yearly VCR reviews, CPI adjusted VCR are calculated using the following method:</p> $VCR_t = \frac{CPI_t}{CPI_{t-1}} \times VCR_{t-1}$ <p>Where:</p> <p>VCR_t (VCR_{t-1}) = Value of Customer Reliability for year t ($t-1$)</p> <p>CPI_t = most recent index value of the ABS <i>All Groups CPI; Australia</i> available at the time of the CPI adjustment</p> <p>CPI_{t-1} = most recent index value of the ABS <i>All Groups CPI; Australia</i> available at the time when VCR_{t-1} was calculated</p> <p>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.</p>

¹ ABS 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 that the AER considers is the best available alternative index.

Table 1.3 Methodology for converting VCR survey results into dollars per kilowatt hour (\$/kWh) VCR values and aggregating values

Methodology step	Description
<p>Deriving \$/kWh standard outage VCR for each residential segment</p>	<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 is divided by an estimate of the consumption which an average 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>
<p>Deriving \$/kWh standard outage VCR for each business segment with peak demand of less than 10 MVA</p>	<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 an average business customer would have consumed over the period had the outage not occurred. This estimate will 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 will be derived 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>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 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</p>

Values of customer reliability – statement of methodology

Methodology step	Description
	<p>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, based on industry or sector groupings, to produce a combined industry or sector \$/kWh VCR.</p>
Aggregating VCR	<p>Aggregate VCR for a particular area or region are derived by load-weighting the relevant aggregate residential and business cohort VCR (including combined aggregate industry or sector \$/kWh VCR for business customers with peak demand greater than or equal to 10 MVA).</p>

Glossary

Term	Definition
ABS	Australian Bureau of Statistics
AER	Australian Energy Regulator
CPI	Consumer Price Index
VCR	Value(s) of customer reliability
WTP	Willingness to pay
\$/kWh	Dollars per kilowatt hour
