VALUE OF CUSTOMER RELIABILITY DIRECTIONS PAPER

PREPARED BY: Corporate Development

VERSION: [Comments]

DATE: 31 May 2013

Contents

1 Executive Summary 4
2 Stakeholder consultation process 5
3 Summary of submissions received to the VCR Issues Paper 6
3.1 Methodology and approach 6
3.2 Granularity 6
3.3 Role and scope of VCR 6
3.3.1 Network planning and regulation 6
3.3.2 Relevance to the wholesale energy market 7
3.4 Consideration of high impact, low probability (HILP) events 7
4 AEMO's proposed direction 9
4.1 Approach and methodology 9
4.2 Customer classes 9
4.3 Role of VCRs 10
4.4 Catering for uncertainty – VCR attributes 11

1 Executive Summary

AEMO's National Value of Customer Reliability (VCR) Review will deliver values of customer reliability (VCRs) that can effectively be applied for use in network planning, operations and revenue regulation purposes in the NEM.

The VCRs will support better decision-making across the electricity industry based on a deeper understanding of the value that customers place on the reliable supply of electricity.

AEMO is undertaking this review for a number of reasons:

- A comprehensive national survey has never been undertaken and a detailed survey on VCR has not been undertaken in Victorian since VENCorp's (now AEMO's) 2007 survey.
- The MCE's Review of the Effectiveness of NEM Security and Reliability Arrangements in light of Extreme Weather Events acknowledged the need for VCRs and recommended AEMO undertook a survey.[1]
- The importance of making more cost effective decisions on network investment has been recognised but there are no regional or sector-specific VCRs that could be used for planning and revenue setting purposes.
- Reconciliation is required between the Victorian and NSW VCRs following the AEMC's work on developing a NSW VCR through its NSW workstream on Distribution Reliability Standards and Outcomes.[2]

This Directions Paper incorporates feedback from submissions received on the VCR Issues Paper published in March 2013[3], as well as face-to-face meetings held with some stakeholders and sets out AEMO views on how to best measure VCR.

AEMO is grateful to all those who provided their time to meet to discuss their views on this review.

AEMO expects that this review will assist in developing VCRs that better reflect customer values; this will ultimately drive more efficient market outcomes.

[1] SCER terms of reference, revised in August 2009: http://www.scer.gov.au/workstreams/energy-market-reform/extreme-weather-events/

[2] AEMC review available at http://www.aemc.gov.au/market-reviews/completed/review-of-distribution-reliability-outcomes-and-standards.html

[3] AEMO's VCR Issues Paper and submissions received available at: http://www.aemo.com.au/Consultations/National-Electricity-Market/Value-of-Customer-Reliability-Issues-Paper

2 Stakeholder consultation process

Stakeholders are invited to submit written responses on AEMO's proposed position outlined within this Directions Paper by Friday 28 June 2013.

The indicative timeline for this review is as follows:

Deliverable	**Timeline**
Directions Paper published	31 May 2013
Submissions due on Directions Paper	28 June 2013
Final Directions Paper on methodology and approach published	August 2013
Measure VCRs in accordance with the methodology and approach	July – November 2013
Draft VCRs published	End December 2013
Submissions due on draft VCRs	Early February 2014
Final VCRs published	March 2014

Where practical within the above review timelines, AEMO will also accommodate requests for meetings with individual stakeholders or public meetings.

AEMO's contact for any queries or further information is Reena Kwong, telephone 03 9609 8492, email *reena.kwong@aemo.com.au*.

AEMO prefers that submissions be forwarded by email as they will be published on AEMO's website. These should be emailed to *reena.kwong@aemo.com.au.*

3 Summary of submissions received to the VCR Issues Paper

This chapter provides a brief summary of the key issues received in submissions and face-to-face meetings.

3.1 Methodology and approach

ActewAGL, Alinta Energy, Energex, Origin Energy and SP AusNet have suggested that choice modelling with some contingent valuation questions to estimate the impact of interruptions is the most appropriate methodology to use for this VCR review.

The Energy Users Association of Australia (EUAA) noted that the Economic Principles of Substitution (EPS) approach would be more valuable as the substitution of fuels to meet electricity users needs acts as a hedge on the VCR.

Grid Australia recommended that AEMO use a number of different approaches to develop a better understanding of the uncertainties associated with VCR estimates.

The Alternative Technology Association (ATA) recommended that: "*Customer consultation for determining VCR must extend beyond surveys, to more rigorous consultative measures such as, but not limited to, workshops, focus groups and opportunities for written submissions as appropriate,"* and that: "*transparency will ultimately be the key to consumers understanding the relationship between the costs and benefits of a particular level of reliability delivered under any national approach".*[4]

The ATA submission also recommended that AEMO *'use a methodology for determining VCR provides for the correct valuation of 'partial supply' DSP-based measures*[5].

3.2 Granularity

All stakeholders supported more granular VCRs, such as sector-specific and location-specific VCRs.

The AER suggested that regional level VCRs would still be useful given that network assets typically serve a region or area that includes a cross-section of consumer types or sectors.

They further stated that disaggregated information by location—including CBD, metro, rural long, and rural short—has been used in setting the targets for the distribution Service Targets Performance Incentive Scheme (STPIS).

They also noted that more granular VCRs—ones that distinguished between different types of outages (timing or duration)—would better reflect consumer needs.

The ATA recommended that VCRs should be distinguishable by consumer sector and the level of criticality of the load supplied.

Origin Energy noted that the customer classifications used for the Victorian 2007 VCR study were useful.

Distribution business responses noted that disaggregation by customer tariff could be achieved and would be useful.

3.3 Role and scope of VCR

3.3.1 Network planning and regulation

Submissions from the AER, ATA, Energy Australia and SP AusNet support the use of VCRs in the network planning and regulation contexts.

[4] Page 7, ATA submission.
[5] Page 10, ATA submission.

The Energy Networks Association (ENA) submission commented that VCRs are likely to increase in importance due to their application in RIT-Ts and RIT-Ds as well as their use under the nationally consistent framework for transmission and distribution reliability.

Networks NSW's submission stated that, in the network regulation context, *"the VCR has been used to set the incentive coefficient under the STPIS which is designed to improve service standards for reliability performance at the margins".*[6]

The South Australian Council of Social Services (SACOSS) submission cautioned that "*the end result of the current use of VCRs in network investments that are multiples of what households have expressed represents a fundamental challenge to allocative efficiency in the NEM unless this is reflected in the way pricing recovers costs from different customer costs"*.[7]

Grid Australia commented that it is beyond the scope of AEMO's terms of reference to determine where the VCR must be applied in the network planning and regulation contexts. Grid Australia have noted that these issues *'are being considered by the AEMC in its current review of the national framework for transmission reliability. Grid Australia's position on these issues will be detailed in its submission to the AEMC's review.'*[8]

3.3.2 Relevance to the wholesale energy market

GDF Suez and Alinta Energy generally support the application of the VCRs to inform the market price cap (MPC); however, GDF Suez does not recommend using the deterministic approach to relate the MPC to VCRs. GDF Suez also believes the VCRs will provide a better approximation for System Restart Ancillary Services (SRAS) than the MPC, but social costs should be included.

Origin Energy and Networks NSW do not believe that the VCR should inform the MPC. They suggest that there are differences between the purposes of the VCR and MPC; notably that the MPC ensures efficient generation investment while the VCR is more suited to informing network investment. Origin Energy stated that: *"The most appropriate signals for promoting timely and efficient generation and network investment are not necessarily the same".*[9]

The AER, Energy Australia and the ATA proposed that should VCRs be used to inform the MPC, the calculation should differ to calculations for network planning and regulation purposes.

ATA also stated that if VCRs are used in the SRAS process, *"they should be developed to specifically reflect customers' willingness to pay to have power restored sooner after a one-in-ten-year outage, rather than willingness to pay to avoid an outage".*[10]

3.4 Consideration of high impact, low probability (HILP) events

Many of the submissions, including Grid Australia, Networks NSW and Ergon Energy, responded that high impact, low probability (HILP) events should be considered when developing VCRs. These submissions stated their concern that the current methodology for determining VCRs neither considers the impact of HILP events nor captures investments driven by HILP events.[11]

Grid Australia noted that while the issue is outside of AEMO's scope of works, *"the VCR should include the costs of social disruption and the broader impacts that would arise from a major or prolonged outage"* and "*the application of VCRs in the context of transmission investment analysis typically places a very low weight on customers' exposure to high impact, low probability events"*.[12]

The AER suggested that HILP events should be considered outside of the VCR development. Their submission proposed that HILP events *"should be addressed via emergency protection and*

[6] Page 3, Networks NSW submission.
[7] Page 3, SACOSS submission.
[8] Page 6, Grid Australia submission.
[9] Page 3, Origin Energy submission.
[10] Page 6, ATA submission.
[11] Page 6, Networks NSW submission.
[12] Page 8, Grid Australia submission.

control schemes. If these events were to be included in the VCR, it could result in the construction of network assets that are unlikely to be used".[13]

[13] Page 5, AER submission.

4 AEMO's proposed direction

On the basis of previous work, AEMO considers that there are clear differences between the VCR of different customer groups, especially on a sectoral basis. AEMO therefore considers that there must be a degree of granularity to VCRs so that they accurately reflect the level of reliability that customers desire. More granular sectoral VCRs would support better decision making in the NEM and would be a significant improvement on the current single average-weighted regional VCRs that have been applied in Victoria for network planning purposes and produced by the AEMC for NSW.

AEMO proposes to calculate a range of VCRs for each transmission connection point in the NEM. The range of VCRs will reflect the value customers place on outages of different duration and severity. The connection point VCRs will be calculated from the measured VCRs for four different customer classes identified below in Section 4.2 and weighted by the proportion of each customer class at each connection point.

Although AEMO's VCR review does not calculate VCRs down to the distribution feeder level, AEMO proposes to provide transparency on each transmission connection point as each customer class at that transmission connection point will be assigned its appropriate VCR. This sectoral VCR will then allow distribution businesses to determine the relevant VCR to apply for its own use depending on the type of load being served by their feeder from that connection point.

AEMO's review will also provide a platform for future VCR reviews and updates of VCRs as more detailed customer information and data becomes readily accessible.

4.1 Approach and methodology

AEMO proposes to adopt the choice survey-based modelling approach. This approach offers customers choices between specific options across both reliability and cost dimensions. Customer are not required to undertake much hypothetical reasoning, and are better able to reveal true customer willingness to pay (WTP) for different levels of reliability.

This approach has been employed in other surveys measuring the value customers place on reliability, including those conducted by ActewAGL, SA Power Networks and New Zealand Institute of Economic Research's (NZIER) 2012 survey.

The survey will also include some contingent valuation questions to estimate non-financial losses. Although subjective in nature, AEMO believes the contingent valuation method is more appropriate than the Direct Cost Approach (DCA) or EPS approach as customers themselves place a financial value on their non-financial costs.

Additionally, as done in the Victorian 2007 survey, questions about societal impacts of widespread interruptions will also be incorporated into the survey design to ensure these costs are considered when developing the VCRs.

At this stage AEMO plans to hold initial face-to-face forums to inform customers about the upcoming surveys. Customers who are willing to participate will be asked to provide email addresses so online surveys can be emailed to them.

In order for survey outcomes to accurately reflect the value each type of customer places on reliability, AEMO will obtain a representative sample set of each customer class prior to survey commencement.

4.2 Customer classes

As an outcome of the recent National Energy Customer Framework (NECF) review which is being progressively implemented in jurisdictions from 1 July 2012[14], retailers and distribution businesses now provide customer classification and threshold information to AEMO as part of the Consumer

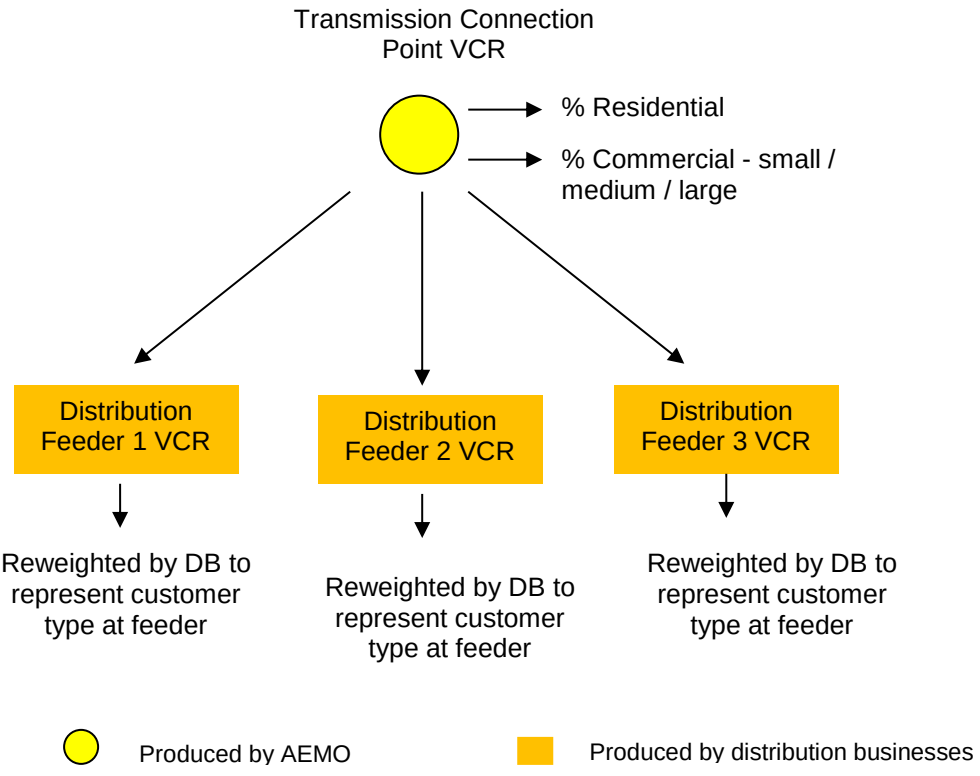
[14] ACT, Tasmania, and the Commonwealth commenced on 1 July 2012; and South Australia commenced on 1 February 2013. The framework will commence in New South Wales on 1 July 2013.

Administration and Transfer Solution (CATS) Procedures[15]. Subsequently AEMO is now able to distinguish customers in its Market Settlement and Transfer Solutions (MSATS) into the following categories:

- Residential customers.
- Small business (average annual energy consumption < 40 MWh/pa).
- Medium business[16] (average annual energy consumption 40–100 MWh/pa).
- Large business (average annual energy consumption > 100 MWh/pa).

Each of these customer classes will have a VCR assigned to them, and this will form the basis of customer disaggregation at each transmission connection point (see Figure 1 below). This disaggregated data collected in AEMO's MSATS database, combined with information readily available from distribution businesses and retailers, improves transparency of NEM customer type at each transmission connection point. The level of granularity also allows the VCRs to be applied in a range of NEM contexts if desired.

Figure 1 – Example of VCRs to be calculated



4.3 Role of VCRs

AEMO acknowledges that we cannot specify the contexts of where the VCR must be applied throughout the NEM. The objective of this project is not to determine how the VCR is used but the selection of the most appropriate measure will be in part dependent upon its intended use. AEMO considers the VCRs calculated through this review will benefit many processes in the NEM by providing confidence that the true value that customers place on reliability is reflected in outcomes delivered. However our primary aim is to develop a suite of VCRs which will be focussed on delivering better network investment decisions.

[15] Available on the AEMO website: http://www.aemo.com.au/Electricity/Policies-and-Procedures/Market-Settlement-and-Transfer-Solutions/CATS-and-WIGS-Procedures

[16] Identified as *small market offer customers* in the NECF

In its role as the Victorian transmission planner, AEMO will apply the VCRs calculated in its transmission planning process. Transmission connection point VCRs applied in the economic planning approach will allow more accurate decision making to occur so that the right investment is delivered when customers in a particular location want better reliability.

A range of other reviews have recommended that VCRs be used in other regions of the NEM, either directly in the investment decision making process or by informing the setting of reliability standards. Reviews have also considered using VCRs in distribution investment decision making.

The application of VCRs in the above contexts will depend on the level of granularity that is desired for the purpose and data available at the time. For example, investment decision making in the distribution planning process will benefit more from VCRs for each feeder. Therefore the accuracy of VCRs by feeder will be reliant on information readily available within the distribution businesses. AEMO understands, that although initially time-consuming, data that the DNSPs have will allow the VCRs published by AEMO to be further disaggregated down to each feeder.

AEMO believes that there should be no difference between setting VCRs for transmission network purposes or distribution network purposes. Whether an outage occurs at the transmission or distribution level is not relevant when determining a VCR; customers are concerned solely about the impact of lost electricity supply, not which section of the network has caused this. The review will therefore deliver a range of VCRs representing customer response to a mix of outage durations and impacts. For investment decision making purposes, AEMO recommends using the appropriate VCRs that corresponds to the network investment location and customer class.

High impact low probability events should also be considered in the network investment decision making process. By including the social cost of interruptions and looking at the VCR for a range of outage durations, the proposed VCRs should be able to be used in this context.

Additionally AEMO considers that the application of VCRs could be useful in other contexts including:

- Revenue-setting purposes by the AER, including for STPIS and informing augmentation capital expenditure programs
- Procurement of non-market ancillary services (NMAS)

As the calculation of VCRs and their form will be focussed on network investment decision making, their use in other potential application would need careful review. AEMO considers that transmission connection point VCRs could provide a baseline value to inform the procurement of non-market ancillary services in the NEM, as they allow for consideration of customers' value of reliability preferences. Further work would be required to determine the extent to which the VCRs would inform an appropriate procurement price depending on the ancillary service required.

Relating to the VCR informing the MPC, AEMO notes that the AEMC have been tasked to identify if there is a link between the Reliability Standards and Reliability Settings with a VCR and how these Reliability Standards and Settings (principally the MPC) should be amended to reflect a VCR.[17] AEMO will focus specifically on measuring and calculating VCRs, not deciding whether VCRs should be used to inform the MPC.

4.4 Catering for uncertainty – VCR attributes

AEMO recognises the uncertainties associated with any quantification of how customers value reliability. The price that a customer is willing to pay is associated with the outage duration as well as when the outage occurred.

To address this, AEMO believes incorporating the following attributes into the survey design will more accurately reflect customer reliability preferences:

- Range of outage duration.
- Outage time of day (peak or non-peak).

[17] As part of the SCER's Extreme Weather Event Review.

- Severity of outage (localised or widespread).

It is very likely the outage duration length and the price at which customers value reliability for particular outage durations will differ depending on the time of day during which the outage occurs (peak or non-peak) and the severity of the outage. This means that a range of VCRs at each transmission connection point will be determined based on the relationships between the above attributes.

A range of VCRs will represent the different outage durations likely to be experienced at a given transmission connection point. This will ensure that investment decisions reflect the possibility of a large number of events, and will more accurately reflect the value customers place on reliability at that location for that duration.

AEMO proposes that VCRs are calculated for the following outage durations to account for different types of events:

- 5 minutes
- 1 hour
- 6 hours
- 1 day
- 1 week

AEMO believes the inclusion of events with longer outage lengths, such as one week, means that the high impact low probability (HILP) type of events will be reflected in investment decision-making.

The impact on customers for each of the outage durations above will also be dependent on the severity of the outage. Whether the outage is a localised event or a widespread one will have a societal impact on the customer's response to these types of outages and must therefore be considered in the VCR calculation.

By accounting for uncertainties through the above approach, the credibility of the VCRs will be improved resulting from more informed decision-making which will deliver efficient network investments.