



Major Energy Users Inc.

Australian Energy Market Operator

Value of Customer Reliability (VCR)

Comments on the Issues Paper

Submission by

The Major Energy Users Inc

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The views expressed in this document do not necessarily reflect the views of the Consumer Advocacy Panel or the Australian Energy Market Commission. The content and conclusions reached in this submission are entirely the work of the MEU and its consultants.

Executive Summary

The Major Energy Users Inc (MEU) remains concerned with the proposal to extend the value of Customer Reliability (VCR) that has been assessed for the Victorian region to other regions in the NEM.

The Valuing of Customer Reliability is a fraught exercise and it must be properly constructed to remove later controversy, let alone avoid sending the wrong signals for what might be otherwise seen as efficient investments.

The MEU is opposed to AEMO's recommendation that because a (properly constructed) survey may cost "more than \$750,000", it was not its preferred option. This is contrary to the recommendation of its consultants and the bulk of submissions to AEMO to date.

The MEU contests AEMO's assertion that the current Victorian VCR is not wildly overestimated and provides a case study to demonstrate why this might be the case.

AEMO has made no attempt to explain why every assessment made for the Victorian VCR shows a consistent increase each time there is a review, nor why the Victorian measures are consistently above the overseas measures.

Many issues need further investigation before AEMO proceeds to implementing regional VCRs.

The MEU strongly supports option 2 and recommends the following:

- AEMO should not use Victorian estimates for setting permanent regional VCRs. If it is essential that regional VCRs are developed for use now (and MEU does not consider this to be the case) then interim VCRs could be developed using the Victorian data but this should be discounted so that weighted VCRs reflect the average of overseas VCRs. The process for weighting should be that suggested by Oakley Greenwood.
- AEMO should form a consultative panel to address the various issues that have been identified in the various submissions and specifically highlighted in section 3 below. In particular, a process must be developed under the aegis of this consultative panel that ensures responses to any surveys are developed to reflect real costs that consumers might face. This consultative panel should be heavily represented by consumers as they are the parties most affected, although it is recognised that generators are also affected even if they are not responsible for paying for the networks.

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- AEMO should establish a survey approach in each region that provides useful and accurate input into developing the basis for regional VCRs. Such a survey should be developed under the aegis of the consultative panel.
- VCRs once developed by accurate surveys should be adjusted each year using CPI rather than surveying on a regular basis. A once only approach to setting VCR (providing it is done properly) should last for many years.

1. Introductory observations

The Major Energy Users Inc (MEU) remains concerned that this Review is seeking to extend the Value of Customer Reliability – VCR - assessed for the Victorian region to other regions in the NEM, but without examining whether the Victorian approach and values are appropriate.

The use of VCR is particularly important from the standpoint of consumers, as the VCR is the prime value point for assessing whether a proposed network augmentations passes a cost benefit analysis and can then be determined to be economically efficient, thereby allowing incorporation into a network's regulatory asset base.

The MEU supports the principle behind using a properly constructed assessment of the value of reliability as this removes much of the potential for later debate as to whether an augmentation is efficient.

1.1 Setting the VCR

However, the issue of setting VCR measures is a fraught exercise as the AEMO has noted. There are considerable costs associated with surveys and then there is a need to balance the outcomes between the different classes of customers surveyed. The concern to all consumers is that there is therefore a tendency to use ever increasing values for VCR to ensure that the customer with the highest assessed VCR is appropriately accommodated.

In particular, the valuation process depends on the way customers are asked the question as to how they value reliability (and are prepared to pay extra for it) and whether they have applied sufficient thought to the answers they give.

To exemplify this point, one MEU member which has moved from buying electricity by retail contracts to taking spot price risk (with load shedding when spot prices are high) provides the following case study as to how it values electricity supplies (see box 1).

This case study shows three critical elements that AEMO needs to address as it looks to find appropriate values for VCR:

1. Responses from customers that are not fully investigated by them are likely to result in excessively high values of VCR
2. Getting an informed response requires considerable effort and takes time on behalf of the customer
3. Even for a single customer there are different values for VCR that apply for different parts of the production processes of the same firm.

A similar approach to this case study for other customers is likely to result in similar outcomes.

Box 1

A load shedding case study

When it was initially proposed to internal senior management that retail contract prices for electricity were too high and electricity could be sourced at a lower cost by operating in the spot market, the response was that the risk was too high as the spot price could reach the market price cap and the funds available would not be sufficient to pay for the electricity used at that time. When it was suggested that this risk could be managed by load shedding, the response was that this was impossible as the internal costs for shut down and start up would be too high. In addition, to lose production would be to put at risk the ability to meet customers' delivery requirements. Implicitly the initial response was that the loss of power would cause costs that were much higher than the benefits from lower electricity prices. Production disruption would be impossible to manage.

To address this, the issue of shut down and start up costs were accurately calculated and this took considerable time and effort. Added to these costs were those costs associated with building up stock for the times when load shedding was most likely so that customers would not be impacted by delayed deliveries. It took considerable debate to convince senior management that load shedding was not as expensive as first thought.

The outcome is that this company now operates in the spot market and mitigates its spot price exposure using a three tier load shedding program. Non-essential load is shed when the spot price reaches one level (set at less than 1% of the Victorian VCR), core plant is shed when the spot price reaches a higher level (at less than 5% of Victorian VCR) and critical plant (typically a small proportion of the total load) is never shed at the MPC (although if the MPC was set at the Victorian VCR this might be revisited). An internal fund is established to manage the cash flow and stock levels are managed more closely to ensure customers are not impacted.

1.2 The current environment

AEMO is conducting this review at a time when there is a general expectation that electricity supply costs will rise by 100% in real terms over the next few years, substantially driven by escalating transmission and distribution network prices. Network prices will be affected by the

values for VCR used to substantiate augmentations as the higher the value of VCR, the greater the amount of network augmentations will be seen as efficient.

Three recent government commissioned reviews¹ have demonstrated concerns with the over-incentivisation of electricity network investments as a result of unbalanced network investment and revenue rules.

The AER has also voiced its concerns, viz²:

“The role of the AER as the economic regulator for energy networks is to ensure that consumers are not paying more than is necessary for the delivery of safe and reliable services. Indeed, this concept is enshrined in our energy legislation. The national electricity and gas objectives are such important principles that they are set out in the National Electricity Law and the National Gas Law. These laws, together with the National Electricity Rules and the National Gas Rules, direct the work of the Regulator.

In essence, the objective set out in the law is to promote efficient investment in and efficient operation and use of energy services for the long term interests of the consumers of energy. It is important that the National Electricity Rules and National Gas Rules, under which the Regulator makes decisions, deliver outcomes that meet this objective.

The AER considers that changes to these rules are necessary for regulatory outcomes to better meet the objective of the Law.

The AER considers that, in order to achieve the objective, it is necessary that the rules allow the regulator to determine an unbiased estimate of efficient costs required to provide these services. That is not the case as the rules now stand.”

1.3 The National Electricity Objective (NEO)

Against this chorus of concerns regarding the strong likelihood of (inefficient) over-investments in networks, the MEU is very concerned with AEMO’s approach in this Review and strongly questions whether it

¹ Garnaut Ross, Climate Change Review, Update Paper Eight: Transforming the electricity sector, Update 2011, NSW Government, Industry & Investment, NSW Electricity Network and Prices Inquiry, Final Report. December 2010 and NSW IPART, Changes in regulated electricity retail prices from 1 July 2011, April 2011.

² Andrew Reeves, Finding the Balance – the rules, prices and network investment. Conference Address, 20 June 2011.

has, to date, given sufficient attention to the NEL objective in its deliberations.

In this regard, the MEU reiterates to AEMO again that any changes to the National Electricity Rules (NER) as a result of the AEMO review will have to be assessed in terms of the NEO.

The NEO requires changes to the NER to increase efficiency. If the VCR is set too high, then inefficient network investments will result. Equally, if VCR is set too low, reliability of supply is at risk.

As noted in 1.2 above, there is already great concern that inefficient investment has occurred under the NER and change is foreshadowed. The AEMO needs to ensure that its proposed approach will demonstrably result in increased efficiency. To demonstrate increased efficiency, AEMO must show clearly that its approach is sound, provides an improvement above current approaches and that the measures used result from a realistic and comprehensive assessment of consumers' costs from a lack of supply.

2. Discussion on and Development of National VCR measures

The MEU's concerns about the AEMO approach proposed in the Review can be illustrated by reference to the following discussion in AEMO's Issues Paper:

"7.3 Development of National VCR measures

The greatest cost concern expressed in submissions was that a high VCR allows greater future network spending, all other things staying constant, with obvious implications for future network charges. This is because of the cost-plus regulation of network service providers and the failure to address demand incentives that result in generally increasing ratios of peak to average network loads. Concerns about rising network charges are grounded in the widespread suspicion that current estimates of the Victorian VCR are too high. Such suspicions are fanned by the fact that they have escalated at a very high rate between the 2002 and 2007 surveys. However, these concerns are independent of decisions about the development of new regional VCR estimates and underscore the need to calculate any new VCRs as accurately as possible.

In contrast, the direct costs of undertaking surveys to calculate the VCR correctly are generally seen as trivial relative to the high cost of not having any estimated value or assuming a value that is either too low or too high. The cost of conducting new surveys for this purpose in five regions may amount to several hundreds of thousands of dollars. However the cost of insufficient network capacity or of unjustifiable over-investment in networks could easily run into millions of dollars. Therefore the benefits of developing sound VCR estimates could potentially far exceed the cost of relying on inadequate information. AEMO believes there is a perceived need to develop new regional VCRs, for each region of the NEM, for use in high-level transmission planning."

AEMO discusses concerns about real escalating network costs, as demonstrated by the recent authoritative reports cited in section 1 above by reference to a theoretical position of "insufficient network capacity" and of "unjustifiable over-investment in networks". It then goes on to opine that there is a need to develop new VCRs for each region of the NEM. It then states there is no linkage to these other concerns, thereby summarily dismissing them from further consideration as part of the VCR assessment. This is peculiar logic to say the least.

Despite there being made very clear concerns about extrapolating the Victorian VCR measures in its recommendations, AEMO essentially ignores these on the grounds that because it may cost more than \$750,000, a survey approach is not its preferred option, and that the Victorian results should be used as the basis for establishing VCR measures for other regions. In this regard, AEMO, however, acknowledges that this is not the recommendation of its consultants:

“The recent Oakley Greenwood report published extensions of the existing Victorian survey data to other regions by applying region-specific weighting factors. This was never considered by Oakley Greenwood to be an adequate reflection of the costs for individual consumers in non-Victorian regions. The Oakley Greenwood report also found that non-survey approaches to VCR measurement were inadequate. The submissions generally accepted the need to undertake new surveys.”

AEMO is recommending under its preferred option 1 that VCR measures for other regions should be extrapolated from the Victorian values (specifically the measures calculated by CRA in 2007). This flies in the face of the recommendations from its own consultant and of the bulk of submissions. This is a most concerning aspect of the AEMO Issues Paper and raises very serious questions about the current review process.

The MEU is also quite surprised by AEMO's statement:

“Some submissions argued for a lower VCR to avoid over-investment. However, evidence from the international comparisons suggest that if the current Victorian VCR is over-estimated it is not wildly so. The correct focus in any new VCR estimates should be on the techniques to obtain measures that are as free of bias as practically possible.”

AEMO's VCR measure at \$60,180/MWh does appear to be wildly overestimated as the table 3 in the Background paper shows

Region	Sectors	Source	Original Value	Year	AUD/kWh
Sweden	Residential	Carlsson and Martinsson (2008)	kr 61.16	2004	13.00
Chile	Industrial	Serra and Fierro (1997)	\$US 0.22	1989	0.49
Indian States	Industrial	TERI (2001)	Rs 24.71	2001	1.35
Thailand	All	ERI (2001)	60 Baht	2000	3.22
France	All	Gouni and Torrion (1988)	\$US 3.60	1988	7.96
NE USA	All	ICF Consulting (2004)	\$US 4.11	1977	15.84
Netherlands	All	de Nooij et al. (2007)	€ 8.56	2001	17.98
Great Britain	All	Redpoint Energy and Energy Strategies (2007)	£ 10.00	2006	26.09
Ontario	All	Bhavaraju (2004)	\$US 10.00	1980	33.00
NW USA	All	Bhavaraju (2004)	\$US 16.93	1990	36.57
Ontario	All	Wacker and Billington (1989)	\$US 17.00	1989	37.58
USA	All	Sullivan (2009)	\$US 33.01 ⁷	2008	37.63
Ireland	All	Tol (2007)	€ 40.00	2005	76.39

. Source: AEMO Background paper on VCR

A cursory review of the international comparisons data show only one country (Ireland) has a value above the Victorian VCR whilst others are substantially lower. The arithmetic average of all the VCR measures shows a value of ~\$24,000/MWh which is some 40% of the \$60,180/MWh value currently used in Victoria. The median value of the overseas VCRs is ~\$18,000/MWh, implying that the arithmetic average is not truly representative. AEMO's assertion that the Victorian VCR is "over estimated but not wildly so" is therefore clearly inappropriate if not downright wrong; it is certainly misleading.

However, what the table does provide is a clear view that VCR (at least in other jurisdictions does not seem to increase over time at the rate VCR has increased in the Victorian region.

When the overseas measures for VCR are compared with the four Victorian measures, this demonstrates an even greater variation.

The following table shows the various VCR measures calculated for Victoria at each of the four surveys previously carried out and each escalated using CPI to 2009 values with the values added from the table of overseas measures.

Sector	Monash	CRA (2002)	CRA (2007)	AEMO	Sweden	Chile India	Average of others
Residential	1.04	14.45	13.95	16.33	13.00		
Agricultural	106.30	69.03	96.39	114.68			
Commercial	134.05	67.87	139.29	134.15			
Industrial	15.67	22.57	38.62	45.94		0.92	
Total (weighted)	40.45	36.03	50.88	60.18			29.2

Source: AEMO background Paper, MEU calculation

The only consistency that is shown from the four Victorian assessments made in a 10 year period is that the VCR has consistently increased in every value except for the agricultural and commercial values between the Monash and the CRA (2002) surveys. There is no consistency with the Chile/India VCR for industrial and the average of all other overarching measures is well below every assessment made of the Victorian VCR.

There has been no attempt to explain why each assessment made for the Victorian VCR shows a consistent increase every time a new assessment is made. Nor is there an explanation as to why the Victorian measures are consistently above the overseas measures, other than to consider that the Victorian values are “not wildly over estimated”.

That this phenomenon occurs exemplifies the concerns that submissions make about the use of the Victorian approach to assessing VCR and its use to extend a value into other regions.

3. Other Issues

In section 7.8 on “other issues” AEMO states:

“A number of interesting VCR-related issues have been raised by stakeholder that cannot be resolved simply during the construction of regional VCRs. AEMO proposes that an on-going stakeholder forum should be established to continue discussion of these and related issues.”

The MEU agrees that such a forum should be implemented and that this should occur before AEMO defines what VCR measures for other regions should be, so that concerns can be addressed before determining what appropriate measures might be.

“Some submissions have linked VCR to the Market Price Cap (MPC). Logically, the wholesale equivalent of the retail VCR should be the market price above which the average consumer would no longer be prepared to purchase electricity. Increases in VCR therefore could raise the question (for the AEMC) of also raising the MPC.”

Logic would also indicate that VCR should be reduced as MPC is so much lower than VCR.

MPC is set only after rigorous debate and the merits and demerits of changing the MPC are examined. At the most recent detailed review of MPC, it was generally accepted that a further increase in MPC was not warranted and if it was increased, there might be unintended consequences from doing so. The purpose of comparing MPC to VCR is that both are an indication as to what consumers consider to be the value of their electricity supplies.

Conversely, development of VCR has not been exposed to the same rigour of debate and the fact that it has been calculated to show such massive variation in such a short time period does not compare with the relative stability of MPC which has stayed constant for the past decade and only recently was increased by 25%.

It is argued that VCR, being related to networks which have extended lives of 50 years or more and which are not easily augmented, might be set at a higher value than MPC which recognises that it is comparatively easier to augment the pool of generation. The question then becomes an issue as to what premium should be applied to VCR above MPC. The MEU considers that a premium of a factor of five that applies between MPC and Victorian VCR is grossly excessive.

“AEMO believes that catering for high impact-low probability (HILP) events (such as the Christchurch earthquake) is outside the scope of what a VCR could be used for. It is generally only possible to survey for events within the experience of respondents. However for HILP events the inevitable inaccuracy of the estimated disruption would probably be matched by inappropriate application of the estimated cost in terms of a VCR.”

The MEU would agree with this approach. It is important to note that even though the Christchurch event did result in many consumers being isolated, in terms of the entire New Zealand market, there were relatively few consumers affected even by an event for which Christchurch was a massive event.

This raises the issue as to whether an entire network should be subject to a high VCR considering the risk that at most only a part of the network (along with those consumers affected) will be affected at any one time, or that relatively few consumers would be affected. The Christchurch example looks at the total loss of the network yet an undersized network requires a few consumers to be load shed at any one time, as loss of network capacity during recent bushfires show.

To invest widely in a network when different parts of the network might require different measures, is not efficient. A case in point is that some regions have reliability set at N-2 levels but elsewhere in the same network N-1 is used. There are even parts of networks where N levels of reliability are considered acceptable.

The MEU considers that such a forum as is proposed by AEMO could address these aspects in more detail before region wide VCR measures are implemented.

“Another important issue concerns the point in the power system that is the cause of a reliability breakdown. For survey respondents, it does not matter what caused the outage, so that VCR measures the reliability of the system as a whole. This may imply that the assessment of transmission augmentations that use VCR need to consider all the costs necessary to maintain a given reliability level, including any parallel distribution network augmentations.”

Reliability of supply is lowest in the distribution network. The MEU agrees with the view espoused and considers that increasing reliability in one sector of the supply chain might well not increase reliability at the point of delivery. To augment an already highly reliable element is not efficient from the viewpoint of consumers.

“Social disruption costs have been assessed with the most recent Victorian VCR but are considered to be underestimated. At the same time, some social costs may have been double-counted to the extent that private costs surveyed may not all be a cost to society (if for example, disrupted production for one supplier is substituted by supply from an alternate source where there was no power disruption).”

This observation indicates that the current approaches used in setting the Victorian VCR may be suspect, increasing the concerns expressed by many submitters to the background paper. It also draws attention to the fact that the Victorian VCR is considered to be very high compared to overseas measures and to the MPC.

“The concept of the existing VCR so far relies on power supply being either fully on or fully off for a typical customer. This could be different in a future with a greater capacity for real-time demand response. If consumers were generally able to respond to time-varying price signals they may choose to discontinue low-value uses for electricity (like clothes washing during peak hours) and keep on only those appliances with high-value uses (like an air-conditioner on a very hot afternoon). This makes the concept of a single VCR more complex and, if calculated as it has been up until now, would very likely be much lower.”

The MEU supports the further investigation into these issues, and that such investigation is carried out before regional VCRs are implemented.

4. The Preferred approach of MEU

The MEU considers that the recommendation of AEMO to use the Victorian VCR measures and extrapolate these to other regions is flawed.

Firstly it is not supported by its own consultants and not generally supported by submitters.

Secondly, the MEU considers that because of the magnitude of the costs involved with over-investment or under-investment in network capacity (although the evidence is clearly on the former) option 1 should not be adopted. The importance of accuracy and the **relatively** insignificant costs involved (about \$750,000) pale in comparison when assessed in terms of the millions of dollars in potential losses likely through inefficient investments.

The MEU supports option 2 because:

- It is more accurate
- It minimises the potential for over and under-investment in network capacity
- Spread over 6 jurisdictions the expected cost of \$750,000 is relatively small
- It provides an opportunity to properly establish a set of questions to ensure that the outcomes of the survey reflect the actuality of consumers' approach to reliability as exemplified in the case study in section 1 above. .

Moreover, AEMO has not fully justified preferring option 1. For example, there is concern as to which of the four surveys done to develop the Victorian VCR should be the starting point for calculating the other regional VCRs.

AEMO proposes to use the CRA report of 2007 as the starting point but does not explain why this is preferred to the other three. AEMO then proposes to rebalance the Victorian VCR calculations to reflect the different mixes of each sector in the other regions. This approach to rebalancing is seen as appropriate if the option 1 is to be used.

When each of the four surveys is analysed, there appears to be more commonality between the CRA 2002 report and the Monash 1997 report than with either of the CRA 2007 or AEMO 2009 reports. AEMO does not explain why it prefers the CRA 2007 report to the later AEMO 2009 assessment, when it would be expected that a later survey might be assumed to be more up-to-date.

Below is the table AEMO provided in its Background paper but with all the surveys brought to a common year (2009). AEMO states that its recommendation is to use the CRA 2007 results as the basis for extrapolating the other regional VCRs rebalancing the sector proportions to reflect the differences between regions.

Sector	Monash	CRA (2002)	CRA (2007)	AEMO
Residential	1.04	14.45	13.95	16.33
Agricultural	106.30	69.03	96.39	114.68
Commercial	134.05	67.87	139.29	134.15
Industrial	15.67	22.57	38.62	45.94
Total (weighted)	40.45	36.03	50.88	60.18
Variation from average of O/S VCR of \$24k/MWh	+69%	+50%	+112%	+151%

Source: AEMO background paper, MEU calculations

This shows that there is significant variation over time between the surveys as well as some significant variation in the sectors. The logic of using the CRA 2007 survey as the basis is not explained, despite it providing a VCR significantly higher than was surveyed in earlier times.

The weighted VCR from each survey is compared to the average of the overseas value for VCR, This shows that all of the surveys for the Victorian VCRs are significantly higher than the average from overseas jurisdictions. This shows that of all the surveys, the CRA 2002 survey for VCR is the closest to the overseas

Overall, the starting point is flawed and this produces a result that is too high and out of proportion with other set points such as MPC.

Unless AEMO can provide some logic (and transparency) for preferring the CRA 2007 survey then it should examine using an outcome that better reflects overseas experience.

5. Summary of views

The MEU considers that AEMO should develop regional VCR measures in the following way.

5.1 AEMO should not use Victorian estimates for setting permanent regional VCRs. If it is essential that regional VCRs are developed for use now (and MEU does not consider this to be the case) then interim VCRs could be developed using the Victorian data but this should be discounted so that weighted VCRs reflect the average of overseas VCRs. The process for weighting should be that suggested by Oakley Greenwood.

5.2 AEMO should form a consultative panel to address the many issues that have been identified in the various submissions and specifically highlighted in section 3 above. In particular, a process must be developed under the aegis of this consultative panel that ensures responses to any surveys are developed to reflect real costs that consumers might face. This consultative panel should be heavily represented by consumers as they are the parties most affected, although it is recognised that generators are also affected even if they are not responsible for paying for the networks.

5.3 AEMO should establish a survey approach in each region that provides useful and accurate input into developing the basis for regional VCRs. Such a survey should be developed under the aegis of the consultative panel.

5.4 VCRs once developed by accurate surveys should be adjusted each year using CPI rather than surveying on a regular basis. A once only approach to setting VCR (providing it is done properly) should last for many years.