# SUBMISSION

**WALDO – VALUE OF CUSTOMER RELIABILITY | JUN 2020**

EUAA
Energy Users Association of Australia

## WIDESPREAD AND LONG DURATION OUTAGES: VALUE OF CUSTOMER RELIABILITY – PRJ1003080

The Energy Users' Association of Australia (EUAA) is the peak body representing Australian energy users. Our membership covers a broad cross section of the Australian economy including significant retail, manufacturing and materials processing industries. Combined they employ over 1 million Australians, pay billions in energy bills every year and expect to see all parts of the energy supply chain making their contribution to the National Electricity Objective. Our members are highly exposed to movements in both gas and electricity prices and have been under increasing stress due to escalating energy costs.

The EUAA has been very supportive of the extensive work undertaken by the AER to obtain robust estimates of the value of customer reliability published in December 2019. We consider that the values obtained will provide a sound basis for a variety of policy applications in network planning, regulation and pricing.

In our submission in the early stages of the VCR review we did not support VCR for high impact low probability events if values were based on a survey approach. We argued that:

- It is very difficult to get consumers to properly envisage these circumstances, and
- We were concerned that values will be misleading and lead to an upward bias in the VCR values that are then used to justify over investment in electricity networks and the NEM more generally

We support the AER's conclusion in its December 2019 report that a macro-economic modelling approach is the preferred methodology for calculating VCR for Widespread and Long Duration Outages (WALDOs). Our conclusions on the approach proposed in the WALDO Consultation Paper are:

- The ACIL Allen model is an elegant first step analysis of potential valuations, but the lack of local data on key assumptions e.g. social costs and wideness factor limits can result in upwards bias and hence limits its current usefulness
- There needs to be much more analysis of the social costs estimates to convince us that:
    - Consumers should bear those costs through higher electricity prices, and
    - If yes, the estimates are robust and locally relevant rather than built on overseas studies that are invariably a re-interpretations of a study of a 25 hour blackout in New York City in 1977
- The AER should continue work refining the model to increase confidence around the applicability of its methodology, and the particular assumptions chosen, especially to the local Australian situation – this is much preferable to continuing to apply the ad hoc methods currently in use
- For these reasons we do not support the current model's use to support electricity market decision making until these issues are further researched and there is wide stakeholder support for both the methodology and the recommended assumptions

As ACIL Allen comment on the key input assumptions around social costs, recovery factors, load profiles (p.42):

> "Further research is recommended to better inform these settings in the model."

Before we consider these conclusions in more detail, we discuss the context for this discussion – the level of reliability consumers are willing to pay for and the problems with recent approaches to measuring WALDO.

### What Level Of Reliability Are Consumers Willing To Pay For?

There has been much discussion in the last couple of years around the level of reliability that consumers are prepared to pay for. The most recent and most comprehensive analysis was part of the AEMC Reliability Panel's regular consideration of the NEM reliability standard. In its Final Report on the Reliability Standard and Settings Review in April 2018, the Panel concluded:

> "The current reliability standard and settings are, in our view, achieving their purpose and are likely to continue to do so throughout the review period including with the introduction of five minute settlement from 1 July 2021." (p. iii)
>
> "Setting the level of the reliability standard involves a trade-off between the prices consumers pay for electricity and the cost to consumers of not having electricity there when it is needed. Getting the balance right avoids what some have called 'gold plating' with excess capacity built but not required for many years. In making such a trade-off it is important to understand what level of reliability consumers actually value, and the extent to which a higher standard would better match consumer expectations." (pp iv-v)

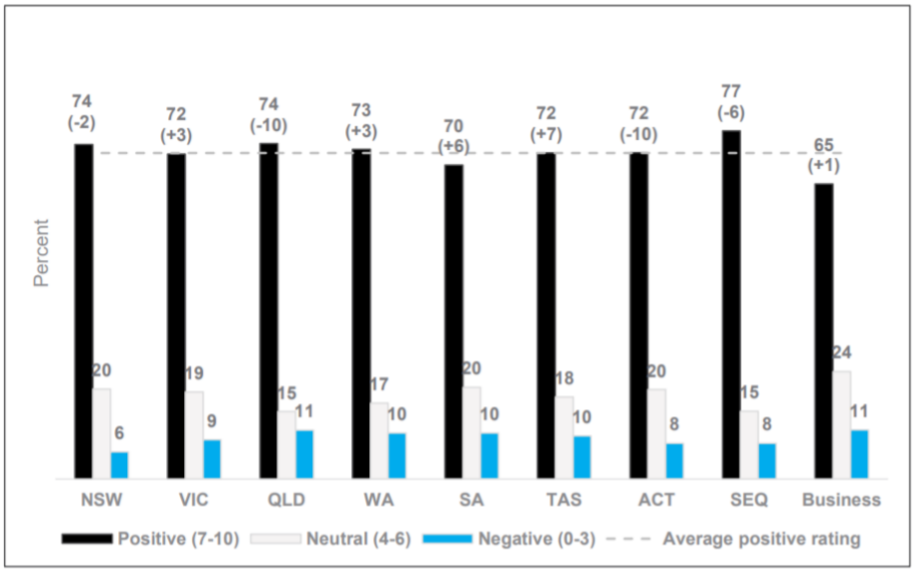
EUAA members support this conclusion.

More recently, the ECA's Energy Consumer Sentiment Survey in December 2019 concluded:

> "Satisfaction with reliability of energy services is generally still very high." (p.8)

***Thinking about the reliability of your electricity supply, how satisfied are you with the number of times you've had loss of power, blackouts our other faults with your electricity supply in the past 6 months? (%)***

***0-10 scale, 0='not at all satisfied', 10='very satisfied'***




Base: Household consumers (n=2,225), Small business consumers (n=524)

We are concerned that the recent COAG Energy Ministers decision to apply a 0.0006% reliability standard until at least mid 2025 may be more a reflection of a politically acceptable level of reliability than what consumers are really prepared to pay for. We are concerned that numbers coming out of the current WALDO modelling, particularly its inclusion of social costs and wideness factor, will be used to seek to further justify increased costs to electricity consumers to achieve that standard if not to lower it further, as AEMO continues its approach to managing HILP long tail events.

However, we wish to limit a Hobson's choice situation where:

- the current approach of applying questionable values continues because no robust alternative exists, and
- using WALDO values that need a lot of further refinement with Australian data before they are considered useful to justify additional expenditure that consumers are willing to pay for.

The limitations of the current approach are clearly shown in two recent reports:

(i) The Deloitte analysis for the Reliability Panel's review of the system restart standard in 2016

This analysis has a general discussion arguing that social costs do exist. In the absence of any explicit measure of the social costs, Deloitte used the upper bound of the AEMO 2014 values with the difference between the average and upper values (+30%) as a proxy for social costs. This upper bound came about through AEMO's analysis of confidence intervals (+/-30%) in their choice modelling results[1] - this has nothing to do with social costs.

(ii) AEMO's Request for Protected Event Declaration in 2018

In justifying its request to the Reliability Panel in relation to South Australia, AEMO argued that (p.15):

> "Using an average VCR is expected to underestimate cost of widespread outages. For this reason, a sensitivity of 2 x VCR has been used to take this into account, which is a standard multiplier in assessing widespread or prolonged events. Results using this multiplier with VCR show similar estimates to the Business SA survey results, and the Victorian load shedding incident."

The 2014 AEMO VCR study did not provide data on the costs of widespread outages, yet AEMO seemed confident to argue that the values the study did provide would underestimate the value of widespread outages. The evidence provided by ACIL Allen's WALDO modelling suggests this is not the case for many categories of consumers across the three scenarios modelled[2]. The AEMO modelling based on weighted average and probability of occurrence put a higher probability on short duration outages that have a higher VCR value than longer duration outages. This suggests the base estimate is likely an over-estimate.

Then AEMO applied a two times factor to the base estimates justifying this factor on the basis that it gave similar total VCR as results from a Business SA survey of members that estimates the impact of the September 2016 blackout. The connection between the SA Business Study and VCR is tenuous at best. The methodology used in the Business SA survey has nowhere near the rigor of that used by the AER in its 2019 VCR methodology. It is not obvious how AEMO came to believe that a factor of two is a 'standard multiplier'.

[1] See p. 31 https://aemo.com.au/-/media/files/pdf/vcr-final-report--pdf-update-27-nov-14.pdf
[2] See ACIL Allen report pp 40-41

Both these examples indicate why we support further development of the ACIL Allen methodology as the preferred approach.

### ACIL Allen Model

| Question | Response |
|---|---|
| Are there additional factors that the AER should consider in developing the range of outages used in the WALDO modelling? | The development of robust Australian data on the assumptions that currently draw on overseas studies; consideration of average GVA over a period rather than a one year point value in the year of the I-O data |
| Is the 15 GWh limit sufficient for the Reliability Panel to make determinations of AEMO requests for the declaration of protected events? | Yes |
| Is the 15 GWh limit sufficient for estimating the economic value of procuring differing levels of System Restart Ancillary Services? | Yes |
| Should we publish VCRs for a number of WALDO scenarios in addition to publishing the final WALDO model? | Not until further model development is undertaken esp. around social costs |
| Noting the limitations in the model, are stakeholders comfortable using the model and applying its outputs in applications such as reviews of the System Restart Standard and declarations of protected events? If not, what other steps could be taken to evaluate the costs of a WALDO related event? | Not yet until further model development is undertaken around the assumptions that rely on limited overseas data |
| Are there additional issues that the AER should consider in setting the wideness factor for outages occurring in the NEM? | Development of robust Australian data |

There is much to appreciate in the rigor that ACIL Allen has brought to its model development:

- For residential customers - we agree with using the existing VCR base and then adding components for size and duration, though much more research is required to have Australian data for these components,
- For commercial and industrial customers - we agree with the choice of input-output model rather than a Computable General Equilibrium or macro econometric models given the relatively short duration of the outages modelled. The approach to using input-output tables, energy intensity measures, ANSZIC data on consumption profiles, recovery factors and restart costs is rigorous. However, again much more research on Australian data for key inputs is required.

We discuss the assumptions on social costs in the next section. Here we comment on two key model assumptions.

*(i)* *Wideness factor for residential VCR*

This concept is based on the proposition that consumers are prepared to pay more to avoid a 'widespread' outage than a localised outage. There is a very limited basis for this proposition in the December 2019 VCR results[3], illustrated by the following table from the residential choice results.

**Table 2-51. Climate Zone 6 CBD & Suburban residential outage estimates**

| Outage variable | Coefficient estimate | Statistically significant? (%) | Standard error | WTA estimate ($/month) | Standard error | Lower confidence interval | Upper confidence interval |
|---|---|---|---|---|---|---|---|
| Status quo outage | 0.5178 | Yes (99%) | 0.0410 | 6.83 | 0.50 | 5.86 | 7.81 |
| Severity | -0.0816 | Yes (99%) | 0.0244 | -1.08 | 0.32 | -1.71 | -0.44 |
| Duration 3 hours | -0.3442 | Yes (99%) | 0.0320 | -4.54 | 0.43 | -5.38 | -3.70 |
| Duration 6 hours | -0.7483 | Yes (99%) | 0.0347 | -9.88 | 0.51 | -10.88 | -8.87 |
| Duration 12 hours | -0.9342 | Yes (99%) | 0.0373 | -12.33 | 0.58 | -13.46 | -11.20 |
| Peak | -0.2235 | Yes (99%) | 0.0251 | -2.95 | 0.33 | -3.60 | -2.29 |
| Summer | 0.0260 | No | 0.0249 | 0.34 | 0.33 | -0.30 | 0.99 |
| Weekend | -0.0182 | No | 0.0250 | -0.24 | 0.33 | -0.89 | 0.41 |
| Discount | 0.0758 | Yes (99%) | 0.0025 | | | | |

Line 2 'severity' is a proxy for the size or 'wideness' factor, though it had no 'kilometre' size differentiator. This results in a small increase in the VCR, but is considerably less important than duration. Also, there is no data to show what impact, for example, size had with longer duration, i.e. how the wideness factor varies by duration. So, at best, the support for the wideness proposition in Australian data is very loose.

ACIL Allen propose three levels of 'wideness' with different VCR multipliers for each (p.20):

**Table 1 - Wideness factor**

| Area impacted as specified by user | Standard VCR multiplier |
|---|---|
| Radius of impacted area <5 km | 1.0 (no adjustment) |
| Radius of impacted area between 5 km and 85 km | 1.1 |
| Radius of impacted area >85 km | 1.3 |

In the absence of Australian data, ACIL Allen had to draw on two studies done in the EU – one in Austria and one covering all of the EU - to assess both the radius of the impacted area and the multiplier. The >85km radius came from the Austrian study:

> "Austria has nine provinces ranging in size from 415 square km to 19,178 square km. The three smallest contiguous provinces have an area of around 23,000 square km which equates to a radius of around 85 km. The highest level of wideness is therefore for outages that cover an area with a radius greater than 85 km."[4]

[3] See Appendices A-E p.23
[4] ACIL Allen p.7

This seems of little relevance to Australian geography and population density. The 5km divisor was 'judgement'.

The 1.3 multiplier came from both overseas studies – the EU example was a 5 hour outage across all 27 countries where the modelling suggested a WTP of 32.7% higher than an outage for their local neighbourhood. Again, the relevance to Australia for outages beyond 12 hours is limited. The 1.1 multiplier did not come from any study but was 'judgement' – the radius was smaller so the multiplier must be smaller.

*(ii)* *Input- Output multipliers*

The ACIL Allen model uses 2016-17 National Accounts data that has been escalated at CPI to September 2019 dollars. Given that value varies over the business cycle, taking one year as representative of value added for this WALDO calculation and assume there is a constant GVA/kWh has obvious limitations. For example, VCR for an aluminium smelter can vary depending on the aluminium price. In 2016-17 the average cash LME price was $US1,773/t, in June qtr. 2018 it reached $US2,259. Over the last three months it has averaged ~$US1,450/t. We would suggest that the model be adapted to consider some average GVA/kWh over time.

We do not support the AER publishing VCRs for a selected number of scenarios as:

- Given the model uncertainties, the publishing of $/kWh will appear too deterministic,
- There are so many possible scenarios that could be used, selecting a few might result in more prominence to a particular set of numbers than they deserve.

Our concerns extend to how the model may be used to suit the agenda of the organisation using the outputs. The Consultation Paper seems to try to justify the use of Austrian data on the wideness factors by saying that (p.20):

> "As a result, the values of the wideness factors for WALDOs occurring in the NEM have required a degree of judgment. Users of the model are able to adjust the wideness factors provided this adjustment can be justified with evidence relevant to the scenario that they are modelling."

Being able to change an unsubstantiated input assumption to an alternative assumption that is also not able to be substantiated does not improve the accuracy of the model. To take the example of the wideness factor, substituting say 1.5 for >85kms is not going to add explanatory power to the results as there is no Australian evidence to justify 1.5. If there was then the AER would have proposed using 1.5 rather than 1.3.

It is for these reasons that we do not support the model being used now for reviews such as system restart standard or declaration of protected events because of the lack of Australian data. When better local data is available and the model is considered ready to be used in these matters, there should be a review mechanism by the AEMC or AER to ensure the proponent of the investment appropriately justifies the assumptions used, including an invitation for stakeholder submissions on their appropriateness.

## Social Cost Measurement

| Question | Response |
|---|---|
| Are there additional issues that the AER should consider in setting the social cost factor? | Yes – we consider the argument that electricity consumers should bear these costs has not been made |
| Are there circumstances unique to Australia that need to be considered in the calculation of social costs? If so, how should these circumstances be incorporated into the modelling? | The AER needs to establish the case for the inclusion of social costs before these questions are considered. |

The Consultation Paper proposes to add a multiplier - 'social cost factor' - to the results of the residential and C&I components. This is to cover costs such as increased call on emergency and essential services, lack of electronic banking, lack of communications and the social impact of blackouts. ACIL Allen reviewed a limited range of studies and most, if not all, seemed to build on a 1977 study of a blackout in New York City that lasted roughly 25 hours. This study suggested a ratio of indirect costs to direct costs was approximately five. However, after 'normalising' i.e. removing specific New York factors, this was reduced to 47% (i.e. a factor of 1.47). This recognises the variability depending on the circumstances of the outage and other factors such as location and socio-economic conditions.

ACIL Allen have proposed a factor of 1.3 to apply to the residential and industrial loads with the exception of metal smelting. The logic of the latter seems to be twofold:

- social costs are not really relevant to smelters – if a smelter is not producing there are limited social impacts outside of the smelter location,
- given smelter impacts can be large where a potline freezes, adding a social cost factor would result in a very high (unrealistically high?) VCR.

We can understand the former but not the latter.

We have three comments:

(i) Why has the modelling explicitly assumed that electricity consumers should pay for these social costs?

Leaving aside the issue of what the scale should be is the more fundamental question is this - why should electricity consumers pay these social costs through higher electricity costs? Why should electricity consumers pay the higher costs of emergency services when there is a blackout? Why should electricity consumers pay for the higher costs of some people not being able to go to the movies? Why should electricity consumers pay for any distress caused to animals? Why should electricity consumers pay for people being stuck in lifts? This is not explained in the ACIL Allen report (nor in any of the other reports mentioned here).

We would suggest that the risks of major outages are best managed by the industry impacted - telecommunications and financial services businesses or building owners who install back-up electricity generation in the building.

We note the AER's description in the purpose of the model:

> "The model has been designed to only estimate the costs incurred as a result of an outage. The model does not capture the costs incurred from the events that could cause WALDOs, such as the destruction to property and interruption to trade arising from severe storms, cyclones, fires and flooding. The model has not been designed to capture the costs arising from government agencies such as the Australian Defence Force and emergency services deploying personnel and assets in response to extreme events to meet the needs of affected customers. This is because these services are funded outside of the mechanisms contained in the National Electricity Law framework." (Consultation Paper p.9)

It is difficult to understand why there is a distinction between the costs of the ADF helping out in a widespread blackout and the costs of police and emergency services personnel. Both should be funded outside of the mechanisms contained in the National Electricity Law framework.

In many of the examples cited for these social costs, the impacted business would have some form of business interruption insurance, the cost of which is recovered from the prices paid by the customers for those business' products. Why should an EUAA member who has both its own back-up generation and business interruption insurance have to pay twice (or three times) through higher electricity prices? This is not explained in the ACIL Allen report. For example, its analysis of the New York blackout showed the following costs for increased insurance (Table 2.13 p.25)

| | | |
|---|---|---|
| Insurance | Federal crime insurance | 3.5 |
| | Fire insurance | 19.5 |
| | Private property insurance | 10.5 |

The implicit assumption seems to be that using the WALDO VCR's in the cost benefit analysis to justify additional expenditure in the electricity supply chain will lead to the saving of this amount in insurance premiums. What is more likely to happen in practice is one of two situations:

EUAA member has a business interuption policy:

- EUAA member makes a claim (along with many other companies impacted by the blackout) on their policy,
- The member's premiums increase in the following year and this increase will be sustained beyond the time of the augmentation being commissioned,
- No insurance savings will occur and the member will face both increased premiums and increased electricity prices – they pay twice.

EUAA member does not have a business interuption policy[5]:

- After the event the EUAA member takes out a policy and/or buys back-up generators,
- Premium is higher than it was prior to the blackout event reflecting the insurer's view of increased risk (and to recover the pay-out from the insurance event),
- Augmentation is commissioned that addresses the blackout problem but premium is not decreased.

We consider it unrealistic to assume, as ACIL Allen implicitly does, that the business insurance premium will go back to the pre-blackout level when the augmentation is commissioned. What evidence is there that insurance companies will design a premium policy that differentiates between whether a business in located within the region

[5] The Business SA survey cited above found that many of the affected businesses did not have business interruption insurance cover and a majority of those that did found that their policies did not cover them for the specific losses they suffered.

of the WALDO vs one that is in the next street over? If the member has bought a back-up generator then they will still pay higher electricity costs for the augmentation.

(ii) Why has the modelling assumed that the 'base' VCR values do not already include a component of social costs?

In asking a residential or business consumer what they are willing to pay to avoid unexpected power outages it is reasonable to assume that at least in some cases this value will include a component of inconvenience or social cost. We would suggest that part of the reason the AER VCR values showed that consumers were willing to pay more to avoid wider interruptions was a reflection of the potential social costs e.g. a widespread outage will make it more difficult to get around my normal business because of traffic lights being out, difficulties to recharge my mobile phone, potential of being stuck in lifts and so on.

As Deloitte Access Economics commented in their report on the Review of the System Restart Standard discussed above, noted:

> "VCR is likely to incorporate a number of the direct tangible costs and some of the indirect tangible costs. In particular, business participants to the VCR survey likely incorporated some cost of business disruption in their estimate of their willingness to pay or willingness to accept responses.
>
> Nevertheless, in our view, VCR is unlikely to fully capture indirect tangible costs (particularly disruption of public services) and intangible costs."

We agree, in principle, with Deloitte's conclusion. The issue, assuming the proposition that consumers should pay for social costs is agreed, which none of the reports discussed in this paper have been able to address is - how much is caught by the survey responses and hence how much double counting might be included with adding on a social cost component to the base VCR values? The approach seems to be 'judgement' that Deloitte says in using the upper bound of AEMO's 2014 numbers, AEMO says is double the 2014 VCR numbers and ACIL Allen says is 30%.

(iii) The basis for selection of 30% is tenuous at best

Even if there is a case for some component of social cost, then there needs to be much more analysis around the selection of the 30% and why it should be applied equally to residential and C&I consumers.

Once again, thankyou for the opportunity to explain our views on these important matters.

Sincerely,

Andrew Richards
Chief Executive Officer