Melbourne
Energy
Institute

AER - VCR Review

Melbourne Energy Institue project summary

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1. Introduction

The Melbourne Energy Institute (MEI) at the University of Melbourne was commissioned to provide expert services to assist the AER with their first review of the Value of Customer Reliability (VCR) for the National Electricity Market and the Northern Territory. The commissioned work comprised:

- Advice on the design of customer surveys;
- Advice on various technical and statistical matters regarding the analysis of the findings;
- Quality assurance of the results and findings

Mid project, additional advice was also requested on:

- *High Impact Low Probability events*, later called *(Widespread and Long Duration Outages*);
- An alternative methodology for assessing the VCR using *Revealed Preference techniques.*

The MEI team was:

- A/Prof T. E. Jones, Project Manager, MEI, University of Melbourne
- Prof. K. Train, University of California, Berkeley USA
- Prof. I. Gordon, Statistical Consulting Centre, University of Melbourne
- A/ Prof. G. Hepworth, Statistical Consulting Centre, University of Melbourne
- Prof. P. Mancarella, Department of Electrical and Electronic Engineering, University of Melbourne
- Dr. V. Nemes, Department of Economics, University of Melbourne
- Prof. M. Brear, Director, MEI, University of Melbourne

2. Project stages and milestones

The Project ran from October 2018 to December 2019. The first stage of the Project involved engagement with stakeholders and a review of what had been done previously by AEMO, in order to formulate the design for the Pilot survey.

MEI's contributions to the first stage of this project were as follows:

- The 2014 AEMO VCR methodology was reviewed and found to be a robust approach.
- Discussion was facilitated regarding other methods to derive VCR values and further consideration of a Revealed Preference approach suggested.
- Advice regarding the decision to split the pilot survey in half using AEMO's 2014 questions and the other half using a new set of questions and financial values.
- Advice on the formulation of questions to minimise bias.
- Advice on the financial range in the choice questions.
- Advice on the mix of choice model and contingent valuation methods to be used.

The second stage of the Project was a Pilot Survey (1,343 respondents) carried out by KPMG and Insync with refined survey questions and methodology. Analysis of the survey was carried out by KPMG, insync and the AER with comment from Prof Train.

MEI's contributions to the second stage of this project were as follows:

- Advice on Improvements to the design of the choice sets compared with the AEMO 2014 survey.
- A report commissioned by the ECA, from Energeia was reviewed, looking at key drivers for VCR values and the estimation methodologies.
- Advice that a revealed preference approach might have value and be of potential future use.
- Quick identification and addressing of errors in data entry.
- Comparison between the AEMO 2014 survey and the new survey questions.
- Advice on the use of NGENE for analysis and some redesign of the choice sets used for the Main Survey.

The third stage was to carry out the Main Survey (9,314 respondents) with a few minor improvements to the survey design. The analysis of the survey was done by the AER, KPMG and insync with the AER carrying out the contingent valuation analysis supported by Prof Train.

MEI's contributions to the third stage of this project were as follows:

- MEI suggested and supported the AER in undertaking their own analysis of the results separately which would then be cross checked against the results from KPMG. This proved very successful, with particular thanks to the efforts of Richard Hayes at the AER, Prof Train and KPMG.

The fourth and final stage of the Project was to calculate the VCRs for the various customer groups and produce a recommendation to the AER Board for use in the next 5 years.
MEI's contribution to the fourth stage of this project was:

- Review of the $/kWh methodology to define VCR for the various customer segments and finding it sound and an improvement relative to the previous methodology.

MEI also reviewed draft decisions and papers throughout the Project.

3. Additional work

Additional work undertaken by MEI during the Project was as follows.

1. Revealed Preferences study

   This was undertaken by Dr. Nemes and supervised by Profs. Gordon, Hepworth and Train. The report was prepared by the team and a draft discussed with the AER, with the final version circulated and discussed with the Stakeholder group and published on the AER – VCR website. This project ran on time and was completed to budget.

   The study presented options and case studies on different methodologies for the AER to consider. It also recommended that a pilot study should be done to assess whether such approaches should be used in the next determination. It is expected that the use of revealed preference data can improve VCR estimates but, prior to the next determination, practical issues about its implementation, including its cost, need to be addressed.

2. High Impact Low Probability Events

   A paper and two presentations were given to the AER and the Stakeholder group by Prof Mancarella from his work on uncertainty in planning to assist formulation of the AER's approach. Following this, the AER engaged ACIL Allen to develop a model to calculate VCRs for widespread and long duration outages (WALDO). This is due to be available in the first quarter of 2020.

   MEI presented experiences of similar work in assessing HILP events and power system reliability and produced a briefing note on Planning Options and VCR for HILP Events. The AER created the HILP subcommittee working under the VCR Consultative Committee to work in parallel with this issue. The MEI reviewed the ACIL approach and provided comment.

4. Stakeholder management

4.1 The Stakeholder Group

The VCR Consultative Committee meetings were well attended and was an effective forum for open discussions led by the AER on all aspects of the process. The MEI provided briefing notes and presentations on specific subjects at these meetings and responded to questions from the AER and stakeholders.

4.2 Consultants used by the AER

These were KPMG and Insync who assisted the AER in the design, deployment and analysis of result for the Pilot and Main surveys.

Insync's operational role worked well once the scope and questions for the studies were finalised. The pilot survey finished quicker than expected with a good response. The main survey had a good response, in the majority, with a few outlying minority groups needing a little extra time to get an adequate response. For the Main survey AER staff provided the Contingent valuation and Choice modelling analysis with guidance and support of Prof Train. Similar to above, it should also be mentioned KPMG independently calculated the CV and CM values as a cross check to ensure confidence in the numbers.

4.3 The AER team

Throughout the project the AER team handled matters professionally and provided direction as appropriate. Clear decisions were made and communicated to all as the project progressed and additional longer-term work was referred to separate working groups for parallel discussions to the main task, e.g. HILP, Revealed Preferences.

Two senior management reviews were carried out between the AER and MEI to review progress, resourcing and budget. At the first review in May 2019, resource and scope adjustments were made by the MEI and AER to ensure budget compliance and project focus. At the second in November 2019, progress and budget was checked and found to be in order together with confirmation of the focus in the final period.

4.4 MEI team comments

Professor Brear, MEI Director: The AER is to be congratulated on both its administration of this Project and the work that it undertook throughout this Project. Most importantly, the methodologies used throughout this Project were systematically and openly discussed and improved with Stakeholders, and the results were obtained transparently and with a sound evidence base. This is how regulation should be developed and delivered.

Professor Train: The analysis by AER utilises the most advanced methods available, implemented with keen attention to the relevant details. The findings greatly enhance our understanding of the value that customers place on electricity reliability.

Professors Gordon and Hepworth: The expertise of AER in matters related to the National Electricity Market and the VCR, and their thoroughness in dealing with issues, has been obvious throughout this project. Openness to different approaches, such as revealed preference methods, has been admirable. In future surveys we would like to see more use of statistical methodology, especially randomisation, in ensuring lack of bias in results.

Professor Mancarella: MEI's work with the AER on VCR was a tremendous opportunity to provide key inputs into a strategic component of electricity network and system operation and planning. Consideration for resilience besides reliability and inclusion of HILP events in the assessment of VCR ("Value of Customer Resilience"), in particular, represent state-of-the-art discussions that put the AER at the cutting edge of regulatory reforms worldwide, which both MEI and AER should be proud of.

A/Professor T. E. Jones: The AER VCR project was complex and raised many interesting issues. It was a pleasure to work with the professional team at the AER and an interdisciplinary team from the MEI.

5. Contact details

Further information on this Project can be obtain from Terry E. Jones, MEI's Project Manager and the author of this report.

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