Reviewing VCRs

Presentation to AER stakeholder forum

Outline

1. A brief history of the 2014 VCR review
2. How AEMO uses VCRs
3. AEMO's initial thoughts on the 2019 VCR review

2014 VCR review

The last VCR review

- In 2014, AEMO completed a NEM-wide review of the VCR, providing national level VCRs for the first time.
- The study was requested by the Standing Council on Energy and Resources, now the Council of Australian Government (COAG) Energy Council, and was the largest-ever of this scope.

2014 VCR approach

- Following broad consultation on the methodology, AEMO adopted a survey-based choice modelling and contingent valuation approach to derive the VCRs.
- Between November 2013 and July 2014, AEMO surveyed approximately 3,000 residential, business and direct connect customers across all NEM states.
- Using this approach, AEMO derived VCRs for residential customers by NEM state and for business customers by industry sector and size of customer.

The customer survey

- Survey tested customer preferences across a range of variables, including:
  - **Severity** of outage (how widespread it is)
  - **Duration** of outage (how long it lasts)
  - **Time** of outage (peak or off-peak?)
  - **Season** when outage occurs (summer or winter)
  - **Frequency** of outage (how often an outage occurs)
  - **Day** of outage (weekday or weekend)
- Different surveys were developed for residential and business customers, testing a similar range of variables.
- A direct measurement survey approach was utilised for direct-connect customers.

Key findings

- Residential VCRs were similar across all NEM states.
- The most important outage characteristics affecting residential VCRs were
  - length of outage and
  - whether the outage occurred at the time of the NEM daily peak.
- Residential VCRs did not substantially change since the previous (2007–08) values.
- Business VCRs on average continued to be higher than the residential values, consistent with other Australian and international studies.

Key findings continued

- Business VCRs for the commercial and agricultural sectors were notably lower than the 2007–08 values.
- Drivers included increased electricity costs since the previous review and the implementation of energy efficiency savings by businesses in these sectors.
- Larger businesses tended to have lower VCRs than smaller businesses, reflecting the likelihood that larger businesses are better equipped to mitigate against the impact of power outages.
- The survey indicated the majority of residential and business customers were satisfied with their current level of reliability and considered it to be of a high standard.
- The VCRs were broadly consistent with international and Australian VCR studies, where a similar survey methodology and approach had been used.

Key VCR Values

Residential customers

State	NEM	NSW	VIC	QLD	SA	TAS
VCR ($/kWh)	27.74	28.36	26.47	27.17	28.73	30.55

Business customers

Sector	Agriculture	Commercial	Industrial
VCR ($/kWh)	50.96	47.81	47.1

Directly-connected customers

Sector	Weighted Avg	Metals	Wood, pulp, paper	Mining
VCR ($/kWh)	6.47	5.66	1.54	15.99

How AEMO uses VCR values

Application to Network Planning

- VCRs are applied in Victoria, where probabilistic planning approach is mandated. For a reliability driven constraint:

  Energy not supplied (kWh) x Probability of a plant outage = Expected energy not supplied (kWh)

  Value of removing constraint ($) = Expected energy not supplied (kWh) x VCR ($/kWh)

- The expected cost of a potential network or non-network investment are then assessed against the value of removing the constraint, in order to strike an economic balance between network cost and reliability.
- Most real network planning issues are currently related to generation, not demand.

Application to Network Planning

- Locational VCR values can be determined where there is sufficient customer composition data and the area of the unserved energy in Victoria can be identified.
- Often customer segmentation data is provided by distribution businesses, which allows for a weighted average VCR.
- Otherwise, aggregate VCRs will be used in most instances.

Network planning for HILP events

- Some work is being undertaken to change control schemes at interconnectors to make them more resilient to HILP events
- Justifying the cost of such upgrades uses VCR, but only regional VCRs.

Early thoughts on the 2019 review

Survey questions

- The survey should focus on
  - quantifying the value of reliability
  - determining customer tolerance for load shedding.
- The cost-based questions should focus on both cost and reward.
  - That is, the cost to be without power, as well as the required reward to voluntarily stop consuming electricity for a period.
- Painting credible scenarios with detailed consideration of broad impacts may reveal a much higher willingness to pay - rather than simply being asked if the outage affected more than the respondent's own block (a question used in AEMO's 2014 survey).

Widespread and prolonged outages

- The economic impacts of widespread or prolonged events can be distinctly different to shorter duration events at a more localised level.
- The current VCR methodology may miss or underestimate some impacts.
- Other approaches may be necessary to effectively quantify the wider economic impacts of these events.
- This could include more targeted questioning and stakeholder engagement that considers
  - specific times that involuntary load shedding is most likely to occur
  - post event experience of reconnecting and resuming business or household functions
  - wider economic impacts such as public safety, law enforcement and health, among others.

Load shedding arrangements

- The VCR does not inform load shedding priorities under current arrangements, which are designed to prioritise system security rather than cost.
- There are practical limitations in the current system
  - Industrial loads tend to be more reliable to shed in larger capacity blocks, and easier to restore than residential loads.
- An increasingly controllable and dispatchable future with smart aggregation may result in visibility and control over precise amounts of capacity in multiple sectors.
- This may allow the use of VCR in making load shedding decisions.

Future uses of VCRs

- VCRs need to be adaptable to considering the value of being connected to the grid, rather than simply the value of energy delivered.
- The proliferation of solar PV means that some households may be low users of energy from the network, but still value grid availability.
- A traditional VCR based on energy provided will result in different amounts of ‘value’ to customers without PV and those with PV.

Final comments

- Accurate VCRs are critical to ensure the NEM functions in accordance with the National Electricity Objective (NEO), informing planning and operational decisions going forward.
- The updated 2019 VCRs should consider the indirect impacts of widespread and prolonged outages, as well as reliability expectations based on an updated range of credible scenarios that take into account the evolving energy market.
- AEMO looks forward to working collaboratively with the AER on the development of the next VCR methodology as well as its appropriate application in the NEM.

Questions?