

21 April 2017

Professor Mary O’Kane
Chief Scientist and Engineer
NSW Government
GPO BOX 5477
Sydney NSW 2001

Dear Professor O’Kane

NSW ENERGY SECURITY TASKFORCE

I refer to your letter of the 23 March 2017 regarding the NSW Energy Security Taskforce and its terms of reference. Thank you for the opportunity to make a submission to this important review.

Endeavour Energy is an active member of the Energy Networks Australia (ENA) and supports the ENA’s submission to the Independent Review into the Future Security of the National Electricity Market headed by Dr Alan Finkel.

Endeavour Energy has reviewed the specific terms of reference for the NSW review and offers further comments in response.

1) Risks to and the Resilience of the Existing Network

1.1) Heat Waves

Western Sydney has a hotter climate, often 10°C higher than the Sydney CBD and coastal areas. The 2016/17 summer was one of the hottest on record and residents in Western Sydney experienced 10 days above 40 degrees. Consecutive hot days result in high peak demands on our network due to air conditioning loads. A new record peak demand of 4084MW was set in January 2017 coinciding with a 44°C day. A further record for weekend peak demand of 3611MW was set on Saturday 11 February 2017 as maximum temperatures rose to 47°C in parts of Western Sydney. Compounding the effect of increased demand, higher temperatures also result in lower capacity ratings for network assets and therefore reduced overall network capacity.

During these conditions Endeavour Energy’s network overall proved to be resilient during the summer with some localised outages due to overloading.

Endeavour Energy prepared for the extreme heat event on 10-12 February 2017 by:

- Temporarily reconfiguring its network to minimise the impact of failure of network elements to prevent cascading outages. These configurations provide less supply security when loads are at peak levels.

- Placing extra emergency crews on shift to respond to supply interruptions so power was restored safely and as quickly as possible. In the heatwave conditions of 10-12 February, Endeavour Energy responded to 92 supply interruptions caused by overloading of its low voltage network. This affected 6,431 customers in total over the three days who were interrupted on average for between one to two hours.
- Endeavour Energy also cooperated with the NSW Government and the Australian Energy Market Operator in encouraging our customers to participate by providing practical tips to reduce their energy use while remaining comfortable in the heatwave conditions.

1.2) Major Storms

Major storms cause unavoidable damage to overhead portions of the electricity network. Power lines are damaged by fallen trees or branches due to wind and rain. Lightning strikes may also cause damage directly on our network. Endeavour Energy has well established capability and plans to respond to major storm events. There are escalation plans in place, including the establishment of decentralised storm centres and in more extreme cases we are also able to draw on assistance from other Electricity Distributors and selected contractors. In reciprocal arrangements, we offer assistance to other network providers in response to major storms or flood events, in particular to Essential Energy and Ausgrid.

Endeavour Energy believes coordination between other agencies is generally working well in emergency response, our main interfaces are with the Rural Fire service and Fire and Rescue NSW.

Fallen power lines are a public safety hazard and we appreciate the efforts of emergency service agencies (Police, Fire) to guard these hazards prior to Endeavour Energy staff being able to attend the site to render it safe.

1.3) Bushfire

Endeavour Energy believes it has a good working relationship with fire agencies. Power supply will be turned off at the direction of fire authorities in the interest of public safety. On total fire ban days, we limit auto-reclosing on specific parts of our network in the interest of safety. Endeavour Energy has also learnt from past major bushfire events, for example the use of concrete rather than wood poles in bushfire prone areas to improve resilience of the network. In some locations maintaining power supply during fire events is important for operating water pumps used in fire fighting.

2) Regulatory Issues

Underpinning the current resilience of the Endeavour Energy network are the significant capital investments in supply security and asset renewal made over the last decade.

In 2005, *Design, Reliability and Performance Licence Conditions* were applied to NSW Distribution Network Service Providers (DNSPs), including *Schedule 1 – Design Planning Criteria* which listed deterministic supply security standards. In most urban areas this meant a “N-1” criteria, requiring distributors to ensure back up capacity was available for major network assets (i.e. sub-transmission network and zone substations) for the failure of a single network element.

Schedule 1 was adjusted in 2007 to allow a modest level of risk whilst maintaining the deterministic supply security standards. These standards resulted in significant capital investment in supply security in NSW distribution networks up until 2014.

In July 2014, *Schedule 1* was repealed from the Licence Conditions, effectively removing all minimum supply security standards.

The level of supply security in the network is now determined by a probabilistic approach to network planning. Economic regulators have supported these changes as they have sought to address concerns about energy prices and the efficiency of network investment. Endeavour Energy amended its planning approach in response to the amended Licence Conditions.

The Licence Conditions still have annual reliability performance targets based on SAIDI (System Average Interruption Duration Index) and SAIFI (System Average Interruption Frequency) measures for urban and rural customers. The Australian Energy Regulator (AER) also has a Service Target Performance Incentive Scheme (STPIS) in place which imposes financial penalties/incentives based on variance to a target based on historical performance.

In the absence of supply security standards, regulators are applying reliability performance measures to safeguard service levels for customers. However, these measures do not incentivise investment in supply security for high impact low probability events or response to major weather events. There are several reasons for this:

- Both the Licence Conditions and AER reliability targets are based on normalised performance excluding major event days, such as a major event storm of sufficient magnitude. This acknowledges that a DNSP should not be penalised for occurrence of extreme weather events. As the exclusion methodology is based on numeric thresholds, a large event caused by failure of network equipment may also be excluded if the impact is above the threshold.
- Reliability Performance measures are good for managing high probability and low impact events as these make up the bulk of annual performance data. It is difficult to relate high impact low probability supply security events to these measures. For example, if there is a 1% chance that an incident will occur and interrupt 10,000 customers for 48 hours, it translates into an insignificant expected annual reliability performance outcome, but is likely to be considered unacceptable by customers if it does occur.

Furthermore, a major disadvantage of SAIDI and SAIFI performance measures is that each customer is given equal weight. A single residential customer is given the same weight as a major hospital or large industrial customer.

Endeavour Energy considers the abovementioned issues in its risk management processes, however the current regulatory framework does not provide incentive to do so.

2.1) Value of Customer Reliability

Probabilistic planning takes into account the likelihood and consequence of a network failure occurring. If the cost of addressing the risk is greater than the value of benefits, it is considered more economic to accept the risk and shed load if the event occurs.

Probabilistic planning assessments rely heavily on the Value of Customer Reliability (VCR) to calculate the benefits which is expressed in \$ per MWh. AEMO has carried out customer surveys to determine this value but has acknowledged in their "Value of

Customer Reliability – Application Guide (December 2014)” that VCR should not be solely relied upon to assess the economic impact of widespread and/or prolonged outages. This is because the surveys only capture impacts/willingness to pay for individual customers for limited durations and limited area of impact.

It does not take into account the cumulative impacts of widespread outages (traffic lights, people in lifts, public transport, impact on emergency services and hospitals). A good example of where VCR would not adequately capture the full economic impact is the recent blackout of the entire state of South Australia. Therefore, caution needs to be applied in accepting a high level of supply security risk based on VCR.

An opportunity for improvement would be for NSW to have better understanding of the economic impact of widespread outages for specific geographic areas to inform decisions on investment in supply security. For example, the economic impact of losing supply to Parramatta CBD will be many times greater than an average residential suburb.

We trust that this letter has been of assistance to the NSW Energy Security Taskforce. Please contact Ty Christopher (General Manager Asset Management) on (02) 9853 6560 should you have further queries on our submission.

Yours sincerely



Rod Howard
Acting Chief Executive Officer