# Energy Consumers Australia – Consumer Electricity Resilience

The role of the electricity network businesses in delivering consumer electricity resilience

## Context

Resilience is a shared responsibility[1], encompassing, individual resilience, social and community resilience, critical infrastructure resilience and so on.  As a result, delivering resilience needs to be a collaborative process involving individuals, communities, governments and providers[2].  This is true for consumer electricity resilience, which can be achieved through a range of approaches, and may not be the responsibility of the electricity network business.

The current focus on electricity network resilience to mitigate prolonged losses of power typically focuses on electricity network asset resilience[3,4].  However, just because it is "electricity" doesn't mean consumer electricity resilience can be delivered by or is the sole responsibility of the electricity network businesses.

Queensland, which is frequently impacted by cyclones, has extensively explored the electricity resilience of individual consumers and communities.  Preparation ahead of the cyclone season may mean that Queenslanders are potentially more resilient to the loss of power caused by severe weather than southern Australian consumers[5].  Queensland government advice encourages consumers to be ready for up to 3 days without power[6].  Queensland electricity network businesses focus on moving crews into likely impact zones ahead of the landfall of a cyclone so that they are ready to respond[7].  Additionally, the network repair costs following a cyclone have been borne by the government (taxpayers) rather than electricity consumers[8].

## Risk reduction as an approach to consumer electricity resilience

The regulator is exploring a specific value for network resilience[9] and following the recent reviews by the Victorian government[10,11], the Victorian government has proposed a rule change that would place a responsibility on electricity network businesses and the AER to consider investment in resilience approaches to reduce the risk of an event resulting in a prolonged outage.  The Victorian government suggest that investment in risk reduction will be less costly for consumers than repair costs after an event[12].  Australian work[13] on buildings suggests that up to $10 are saved on recovery costs for every $1 spent on risk reduction, however this pre-event investment in risk reduction to reduce recovery costs has not been demonstrated for electricity networks.

Where electricity network businesses have definitively identified a future location-specific risk from severe weather (in climate projection terms, likely to only be in the case of temperature, bushfire, flood or coastal inundation[14]), targeted asset replacement investment is warranted.  This may involve replacement of wooden poles with composite poles during routine maintenance cycles.  For vulnerable large assets, such as a sub-station on a flood plain, a specific replacement program should be developed, potentially with support from government[15].

However, the most severe damage to electricity networks is caused by weather that is not easily predicted or projected by climate models and can only be accurately located on the timescale of typical weather forecasts (10 days or less).  This means that for most prolonged outages, investment in mobile response assets will provide the responsiveness and support consumers require.

If electricity network businesses invest in location-specific resilience solutions, such as islandable microgrids and batteries[16,17], there is a risk that consumers will be exposed to increasing costs with no improvement in consumer electricity resilience[18].

## Solutions that would better meet consumer expectations and deliver consumer electricity resilience

Behind-the-meter approaches

Delivery of behind-the-meter approaches to supporting consumer electricity resilience[19] should not the role of the electricity network business.

Not all consumers can invest in "rational alternatives" or may not want the responsibility of operating a portable generator.  In this case, either community-based solutions and/or grant support for consumer- and community-focused solutions are needed[20,21].

Additionally, community electricity resilience approaches are not the sole responsibility of the electricity network business.  Electricity network businesses have a role in approving the connection for resilience solutions, such as a community hub or a plug in point for a large diesel generator, but the entire solution may be more efficiently and cost-effectively delivered by third-party specialists.

The electricity network business does have a critical role in identifying their vulnerable assets and hence vulnerable locations, communities and consumers.  This information should be shared with funding bodies, such as governments, to support non-network business investment in behind-the-meter and community solutions.

When a customer wishes to install rooftop solar PV (or any Consumer Energy Resource) they, or their agent, must apply to the electricity network business for a connection[22].  At this point, the electricity network business will be able to identify whether the customer is in a poorly served area and could upgrade to a more resilient system (e.g. a rooftop PV system that still generates in the absence of the electricity network).  This upgrade may have an additional cost, and the electricity network business should be able to provide advice and/or refer that customer (with their permission) to a source of funding.  Alternatively, every newly installed rooftop solar PV system should be able to generate in the absence of the network, regardless of location.

Consumer electricity resilience can only be delivered through collaboration.  Where the electricity network business identifies that a consumer or community has a vulnerable supply of electricity, governments should provide financial support for behind-the-meter solutions for consumers and communities that deliver a resilient supply of electricity[23].

Responsive electricity network business approaches: communication

Consumers have made it clear that they expect timely, accurate, sufficient and relevant communications from an electricity network business before, during and after a major event. Consumers and communities also favour in-person support from electricity network businesses.

Electricity network businesses should focus on developing robust communication structures that:
   a. Operate in the absence of commercial land-based telecommunications
   b. Utilise multiple platforms
   c. Can scale up rapidly
   d. Are based in impacted communities
   e. Should include a situational narrative to give consumers an idea of the scale of the event (e.g. "X% of our customers are without power", "we expect additional crews to arrive from interstate tomorrow").
   f. Information is consistent across platforms (the same message everywhere)

Other approaches may include developing "digital twins"[24] to support mapping to the street level, the ability to ingest data rapidly from consumers, such as through "snap send solve" applications[25] to identify network damage and mobile customer support teams[26].

The rollout of smart meters and other network monitoring should allow electricity network businesses to identify outage locations more precisely and convey that information accurately to customers. This data, aligned to crew management and field communications, including portable and established work practices for crews sourced from other businesses, would allow for more accurate restoration times.

<u>Responsive electricity network business approaches: other</u>
The electricity network business needs to be responsive. Responsiveness is largely underpinned by good communication during a loss of electricity. Ensuring that damaged equipment is made safe, so that consumers and communities can leave, should be a priority. Where network repairs are going to take a long time providing temporary electricity supply to a community or at individual customer premises should also be a priority.

The electricity network business should work with the state government and communities to identify a key community building (or location) that can be fitted with the equipment that makes a mobile generator easy to "plug in"[27]. Electricity network businesses should invest in mobile assets that can be moved to communities affected by an outage that is likely to be prolonged. This could include mobile generators, sub-stations[28] and response vehicles[29] that provide electricity and communications to affected communities. These mobile assets could be shared by multiple electricity network businesses.

## Role of electricity network businesses in telecommunications continuity
Electricity network businesses should focus on their critical infrastructure, not that of other critical service providers. Other critical infrastructure providers should develop their own resilience plans that mean they can provide their essential service, such as telecommunications, without network sourced electricity.

Telecommunication companies should:
(a) assess the vulnerability of their assets
(b) assess the vulnerability of the communities they support
(c) ensure that there is power continuity for a minimum of 3 days
(d) ensure that in the absence of network sourced electricity there is a minimum "skeleton" emergency network coverage (including shared access across providers) that supports communication for as long as is needed

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