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Battery Storage and
Grid Integration
Program
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Response to Review of the form of the reliability standard and administered price cap Directions Paper

Thank you for providing the opportunity contribute to the reliability panel's thinking on the form of the reliability standard. The world is changing. Both the way we generate, transport, and consume energy as well as the climate due to the increasing impacts of climate change. We agree with the reliability panel's view that this means people's expectations and experiences of reliability may change.

This response is a collaboration between The Australian National University Battery Storage and Grid Integration Program (BSGIP), Ener-G Management Group, and Planz Town Planning.

In this response we are addressing question 1.

Value of Customer Reliability (VCR) underpins many of the mechanisms through which the energy system is planned, operated, and assessed. It underpins not only the standards the reliability panel sets for overall reliability but also forms a key part of the economic justifications used by transmission and distribution networks. Therefore, it is important that the value used is adequately reflective of the lived experience of Australian consumers.

Previous VCR figures have been arrived at through a willingness-to-pay survey. In this survey participants are offered a choice between paying an amount or experiencing an outage. The VCR figure is related to the value at which respondents become more likely to prefer experiencing the outage rather than paying to avoid it. This has three impacts:

- It proposes reliability and cost as two values to be traded off against one another, a tension which the reliability panel states themselves in their Directions paper.
- It proposes that the impacts of poor reliability are the sum of individual impacts.
- It assumes that people have the financial resources to pay a higher cost for reliability to meet their needs.

We feel this may miss part of the picture, particularly the way reliability impacts some of Australia's most disadvantaged rural communities. Poor reliability impacts many facets of communities. It limits economic growth, impacts health, and impacts education. The impact is especially stark in places where there is already intersectional disadvantage. We have provided an example on the next page of the impact reliability can have on the lived experience of the most disadvantaged.

A clear example of these impacts is felt in communities such as Yarrabah in northern Queensland. Yarrabah is a community whose inhabitants experience significant disadvantage including overcrowded housing and high levels of unemployment. This is exacerbated by poor reliability which causes health and wellbeing impacts as well as limiting economic opportunities. In a traditional willingness-to-pay survey they may indicate a low desire to increase energy bills for increased reliability. However, the more reliable electricity contributes to resolving the barriers that have helped create the disadvantage the community experiences. These barriers have been explored in a recent [feasibility study](#) for a microgrid to supply the community. The way reliability is measured today means that these issues are unlikely to be resolved.

Therefore, we recommend that the reliability panel and the AER take a more nuanced view to reliability and VCR in their considerations around the way reliability is measured in the NEM.

Nikki Huddy (Planz), Ken Ash (Ener-G), and Laura Jones (Battery storage and Grid Integration Program)

Context of reliability and its impacts

There are two considerations we will discuss here: climate change and remote communities.

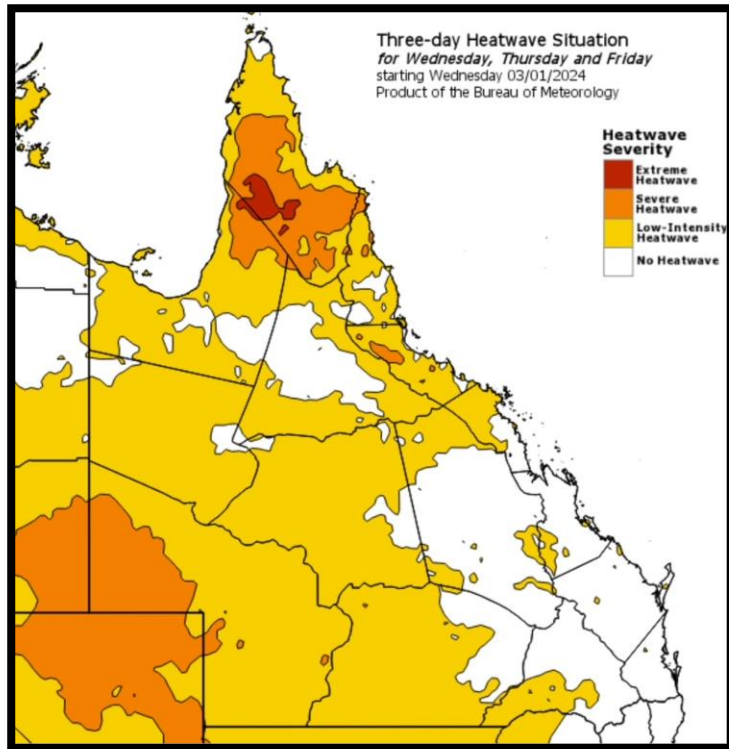
The impacts of Cyclone Jasper: extreme weather will cause greater impacts

Cyclone Jasper and the floods that followed provide a **context** for considering what reliability means to people. Cyclone Jasper, a Category 2 storm, made landfall in the Far North Queensland region on 14 December 2023, bringing damaging winds and torrential rains that resulted in an emergency across a 360-kilometre area from Cooktown to Ingham and widespread power outages in coastal communities covering approximately 20,000km, an area equivalent of 1/3 the size of Tasmania. The region also experienced a 3-week heatwave, where the apparent temperature did not drop below 32 degrees.

The restoration of power to properties as part of the recovery from Cyclone Jasper, the flood that followed and the 3-week heatwave raises important considerations about the reliability standard and administered price cap for electricity services:

- The environmental conditions at the time of an outage are likely to influence a person's willingness to tolerate the outage;
- The circumstances in which an outage occurs may impact on an individual's ability to afford electricity, or an alternative (People using generators after Cyclone Jasper reported that it cost \$86/day to run a generator);
- Smaller and remote communities often don't have access to alternative locations such as shopping centres or cinemas, are at a further disadvantage when power goes out for example there is reduced or no access to fresh food, cooked food and no opportunity for reprieve from environmental conditions such as heatwaves. Stress from excessive heat or cold is a known indicator of health and morbidity;
- A reliable power supply offers co-benefits such as improved health, education, equity outcomes and increased community resilience.

Ergon Energy reported up to 70,000 people (40,000 properties) were without power at the height of the disruption. Reliability for these people, who are typically at the end of grid and fringe of grid, is about the lifeline that a working mobile phone and internet provides, it is about being able to run fans and air conditioners during hot, humid summers and it is about the ability to keep fresh and frozen food cold, when the nearest town is at least an hours drive away. This extreme weather event in Far North Queensland is part of a broader pattern of increasing frequency and severity of similar events such as floods and heatwaves, as a result of global warming. For every 1°C rise in average global temperature, the atmosphere can hold 7% more water vapor, which when released can lead to intense rainfall, as seen in Far North Queensland.



Heatwave Conditions in Northern Australia extended from 21 December 2023 – 5 January 2024

Remote communities and regional communities: Yarrabah case study

The cost-effective provision of electricity to remote and regional communities by government has always been subsidised, due to Australia's size and diversity. This has focussed primarily on cost equity subsidies or standalone / supplementary fossil fuelled alternatives in the form of diesel generation, and in more recent times supplemented with small-scale renewables, predominantly solar. Despite these efforts the supply of reliable, affordable, and sustainable energy to fringe-of-grid and off grid communities has not been fully realised.

It is generally accepted by both residents and the energy provider, that there are lower service standards for electricity supply (more outages, longer outages) in fringe of grid locations. Microgrids can facilitate improved service standards and place these communities on a more level playing field with urban centres.

The social impacts, benefits, and considerations for microgrids are strongly linked to the technical and operating decisions of how the microgrid is structured, owned and delivered.

Currently in Far North Queensland there have been three Microgrid Feasibility Reports (for Yarrabah, Daintree / Wujal Wujal and Milla Milla). The design, modelling and planning for these microgrids has been undertaken with extensive consideration of the operating conditions, policy environment, community capacity and governance capabilities and technology options, with the intent that the solution will provide both technical benefits and social benefits.

The development of fringe-of grid microgrid solutions will challenge the traditional energy supply planning and investment criteria and requires a new way of thinking to deliver improved service standards and socio-economic benefits for vulnerable communities like those impacted by Cyclone Jasper and the flood events of December 2023.

About the authors

The Battery Storage and Grid Integration Program is a multi-disciplinary, industry-focused, research, development and demonstration Program based at the Australian National University. The Program takes a holistic, socio-techno-economic approach to the energy system. Work within the program encompasses detailed disciplinary work on components of the global energy system and on how we integrate these components together to support energy transition and decarbonisation. Staff within the Program have broad expertise that includes engineering, chemistry, computer sciences, physics, economics and the social sciences. The Program places a strong focus on translational research which is defined as simultaneously advancing the body of knowledge and advancing the practice in the field.

Ken Ash of Ener-G Management Group specialises in Power Infrastructure and Asset Management, Electricity Network Connection negotiation, Microgrid concept and feasibility studies, Renewable Energy generation feasibility and engineering, Power System Regulatory advice, and Remote Energy Supply. Ener-G's key clients include end of grid and fringe of grid communities in Queensland and electrical power utilities, resource development companies, renewable energy developers, major energy users, and aid donors in developing countries.

Ener-G has most recently provided Renewable Energy project concept planning and feasibility studies, and Off-grid and remote power station planning and management in the Pacific region and Australia including Napranum (Cape York), the Torres Strait Islands, Yarrabah (Far North Queensland) and Thargomindah (western Queensland).

Nikki Huddy of Planz Town Planning understands living and doing business in regional and rural areas and is known for consistently proving tangible, culturally appropriate outcomes for communities. Planz has been awarded multiple times for Public Engagement & Community Planning, Community Well Being & Diversity and Improving Planning Process by the Planning Institute of Australia. Nikki Huddy is a Churchill Fellow and the Australian Planner of the Year 2020-21.

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