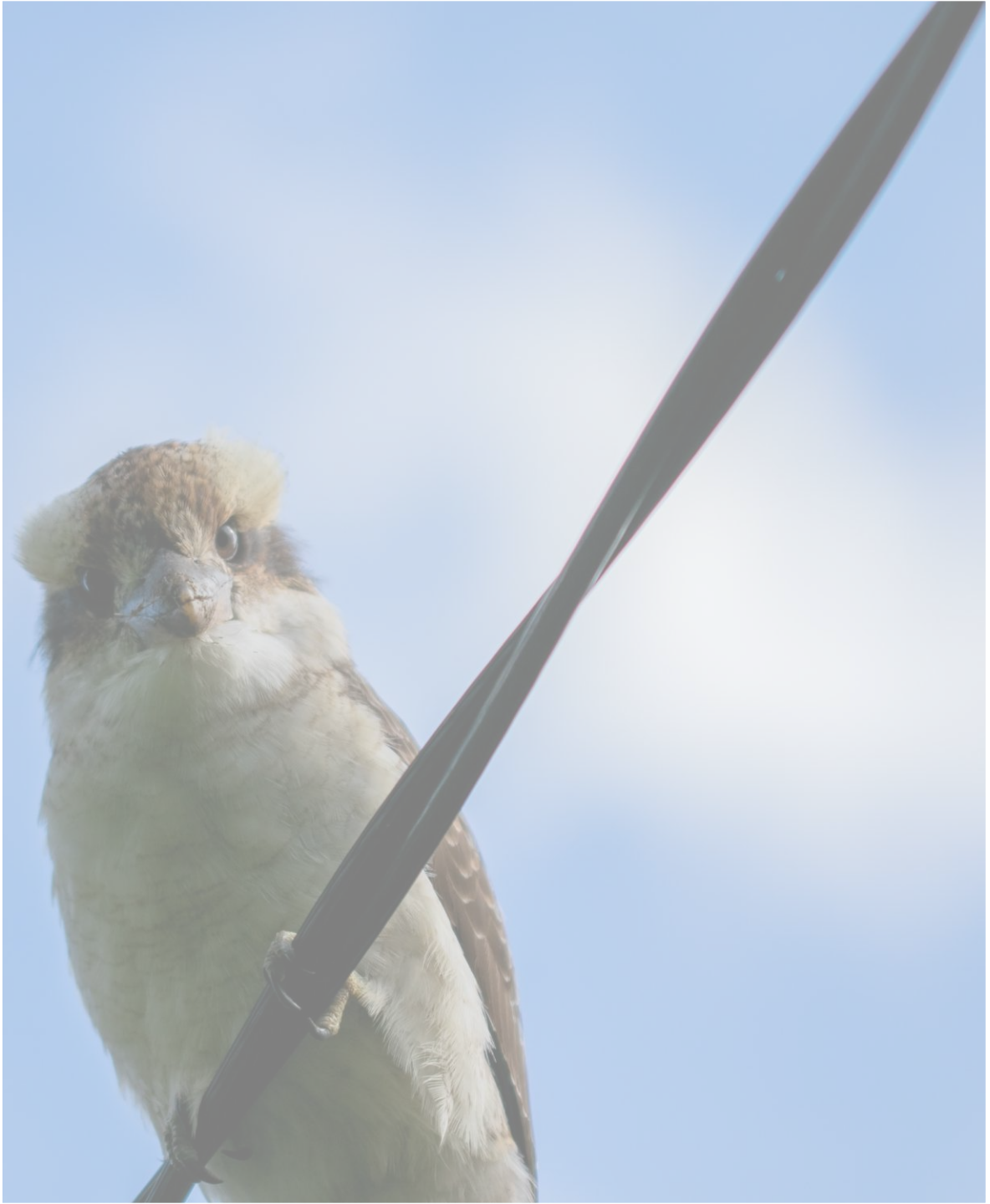


Designing for electricity Resilience: Balancing grid hardening with CER

Jill Cainey

Future Grid Summit
4 December 2025

Erne Energy

When weather attacks

95k without power after wild storms, giant hail smash southeast Queensland

More than 90,000 homes across one state remain in the dark after residents were smashed by dangerous storms and enormous hail – with more on the way.

Clareese Packer, Emma Kirk and Alexandra Feiam

3 min read November 25, 2025 - 9:33AM NewsWire

Storm and wind gusts of 119km/h damage homes, trees, powerlines at Port Pirie

By Josephine Lim Storms

Sun 23 Nov

A severe thunderstorm and hail have causes damage in Port Pirie and surrounds.

5,000 without power

Just the last 2 weeks

Man killed and 117,000 without power as storms lash Sydney and western NSW

By Joanna Woodburn By Xanthe Gregory By Jean Kennedy Storms

Wed 26 Nov

Roofs have been torn off buildings at Kurri Kurri, west of Newcastle. *(Supplied: Edward Richards)*

'Worst since Tracy': Darwin in clean-up mode after Tropical Cyclone Fina brings gales and torrential rain

Strongest cyclone to approach Darwin since Tracy in 1974 intensifies to category 4 as it moves towards northeast Kimberley coast

- Follow our Australia news live blog for latest updates
- Get our breaking news email, free app or daily news podcast

Giant trees were ripped from their roots in Darwin CBD after Tropical Cyclone Fina brought gusts of 195km/h and sustained winds of 140km/h near the centre of the system as it tracked north of the city. Photograph: (A)manda Parkinson/The Guardian

19,500 without power

Is the weather worse?

Number of insurance claims related to severe weather

Up in all states except Queensland

But causes not entirely related to climate change

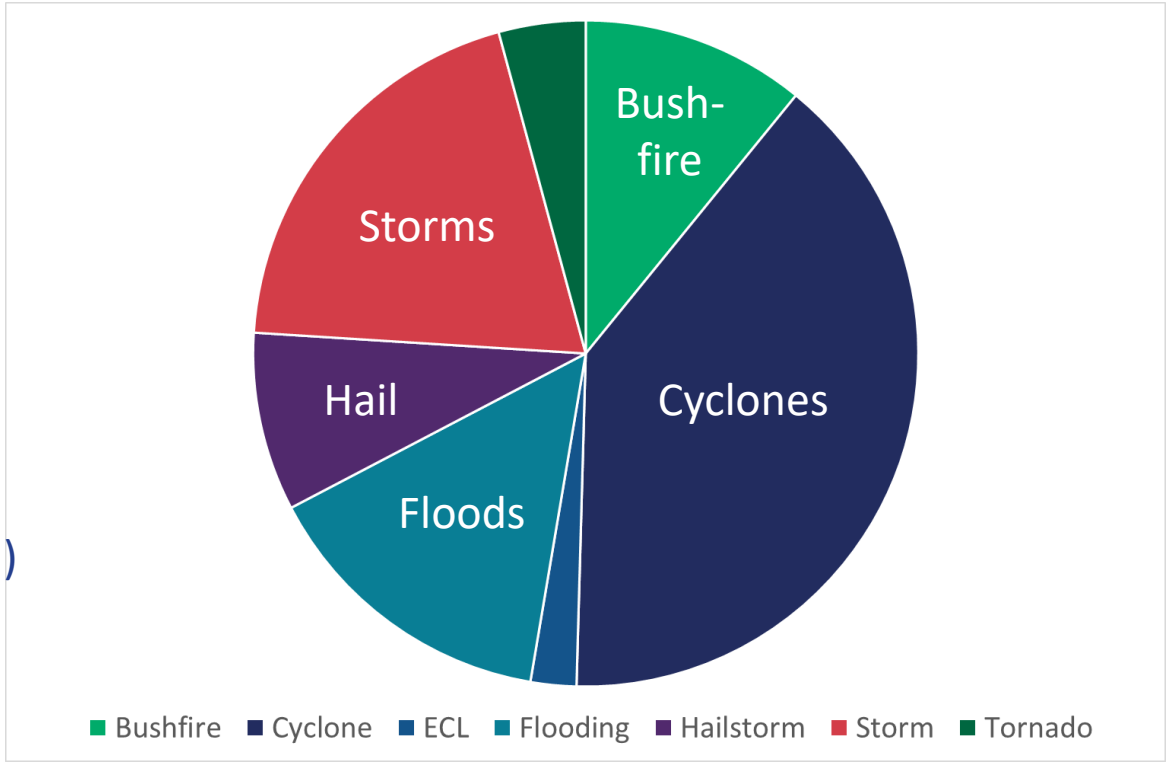
What does climate science say is happening?

Number of low-pressure systems has reduced
Fewer rain events
* Fewer cyclones
* Fewer East Coast Lows

* Intensity of events appears to have increased (wind)

Risk of bushfire up
Risk of floods up

* Thunderstorms not clear (lightning, hail & downdrafts)



Resilience to severe weather

Electricity network resilience is not new, but intense focus since 2020 following the summer bushfires.

Focus on cost of repairs – AER 2022

2024-2029 Resets

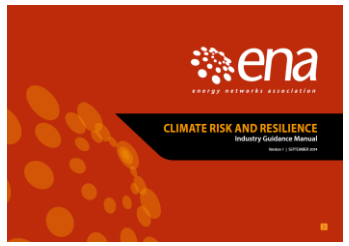
AER Guidance note

Victorian government rule change 2024

Table B.1: Network resilience expenditure proposed by NSW and Tasmanian DNSPs and approved by the AER in the 2024-29 revenue determination

DNSP	Expenditure proposed by DNSP	Expenditure approved by AER	% of proposed expenditure that was approved	% of total approved expenditure that is capital expenditure
Ausgrid	$119.6 million	$41 million	34%	92%
Endeavour Energy	$28 million	$28 million	100%	100%
Essential Energy	$204 million	$121 million	59%	100%
TasNetworks	$17.4 million	$17.4 million	100%	100%

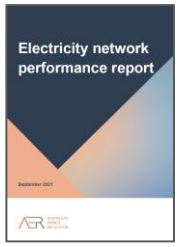
Electricity networks have a bias towards capital investment generally and towards capital investment for “resilience” specifically.



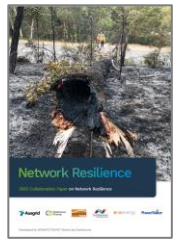
ENA 2014

ENA 2019

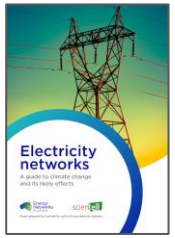
ENA 2020



AER 2021



DNSPs 2022



ENA 2022

AER 2022

AER 2023

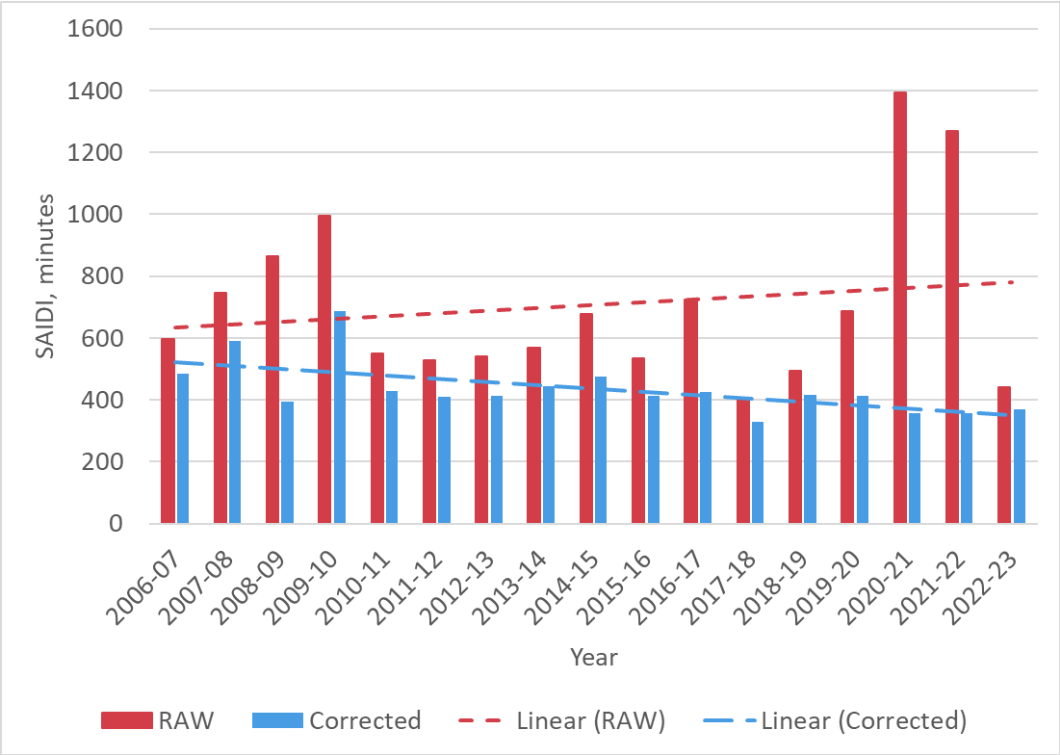
AER 2024

Vic 2024

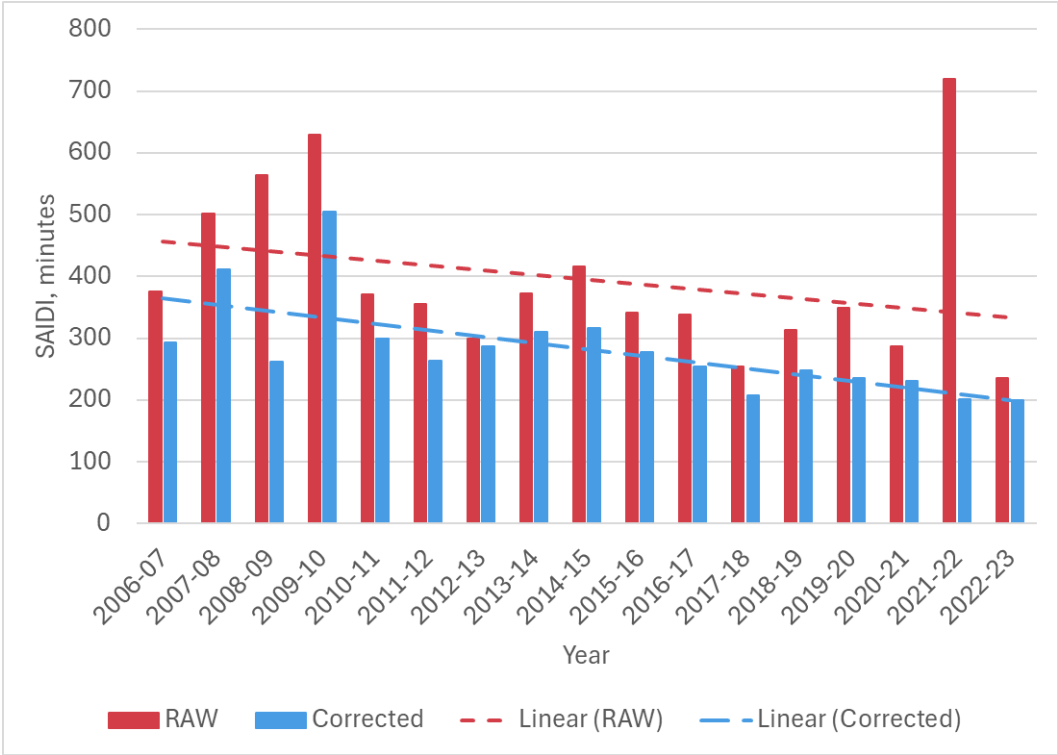

AEMC 2025

What does network data show?

All Victorian electricity network businesses



Excluding Ausnet Services



5 electricity network businesses in the NEM show this increasing trend in Major Event Day minutes.

4 of those have the oldest poles and wires in the NEM.

In aggregate, the trend is a decreasing number of minutes lost to Major Event Days.

As seen in the recent AER State of the Market report.

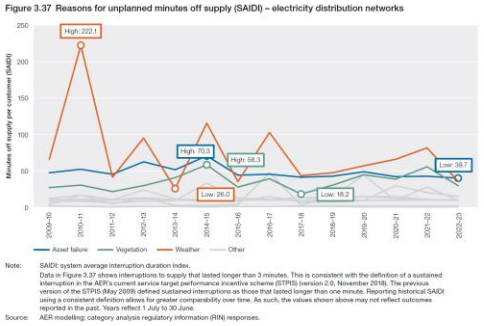
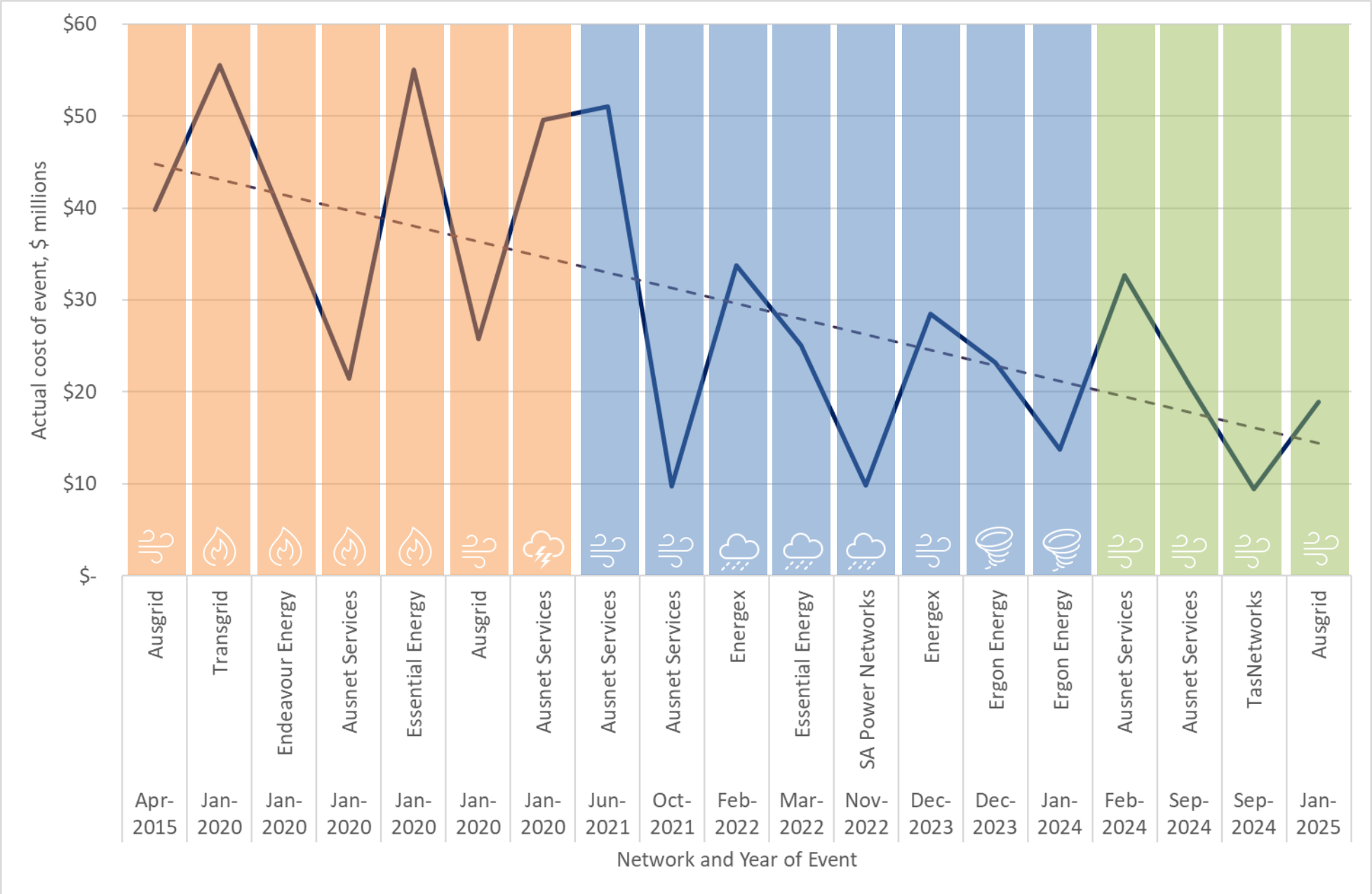


Figure 3.37 Reasons for unplanned minutes off supply (SAIDI) – electricity distribution networks

Costs of severe weather events – after the event



Electricity is an essential service

Consumer electricity resilience

Consumer electricity resilience ensures that all consumers are ready, can quickly respond and recover from a loss of network electricity, while continuing to **meet their essential needs with a supply of electricity**

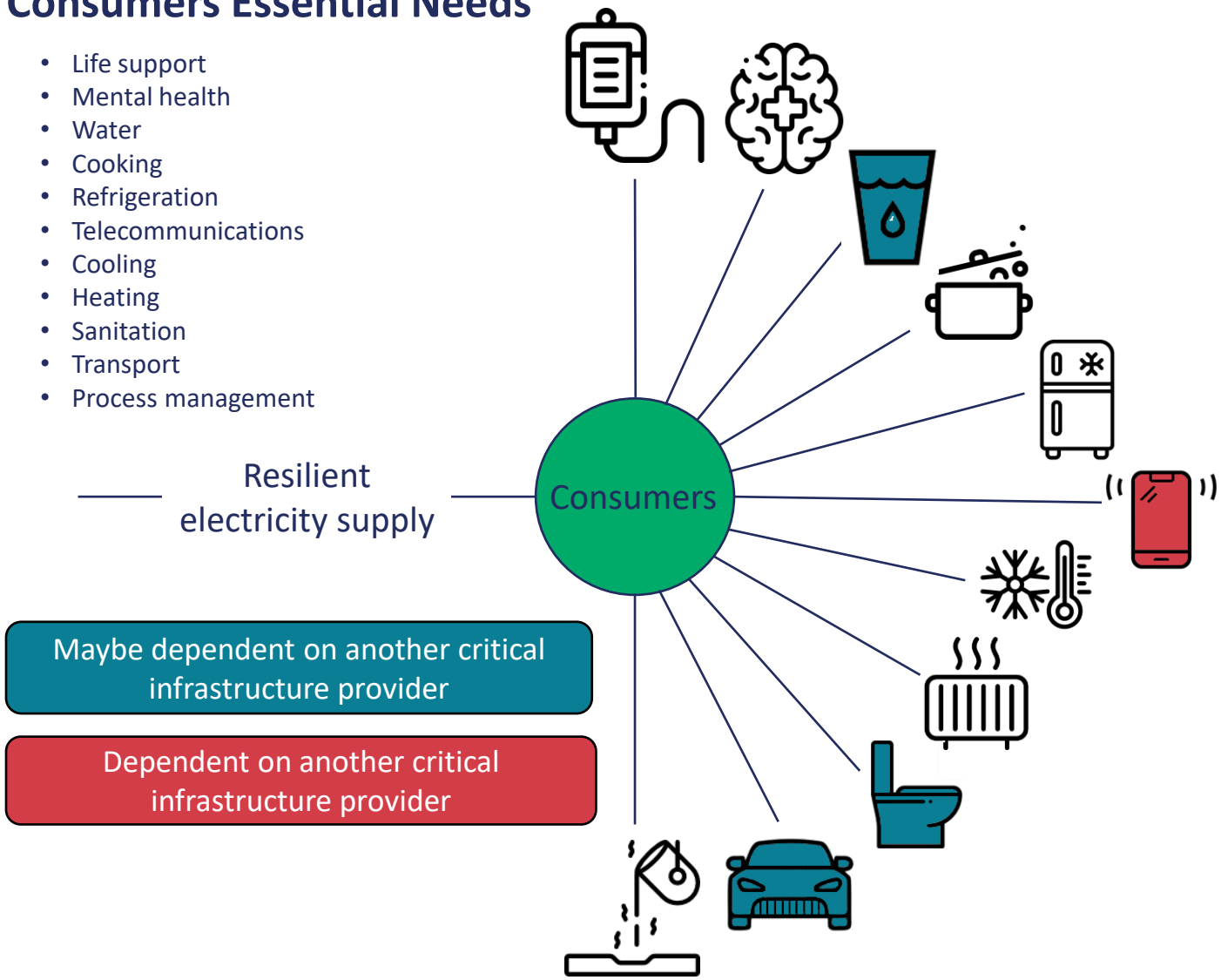
Electricity network resilience

Regulator (AER): It is the **network's** ability to continue to adequately provide network services and recover those services when subjected to disruptive events.

Victorian electricity network business: Resilience is the capability of **an electricity network** to recover quickly from unexpected events or disturbances, such as severe weather.

Consumers Essential Needs

- Life support
- Mental health
- Water
- Cooking
- Refrigeration
- Telecommunications
- Cooling
- Heating
- Sanitation
- Transport
- Process management



Approaches to resilience

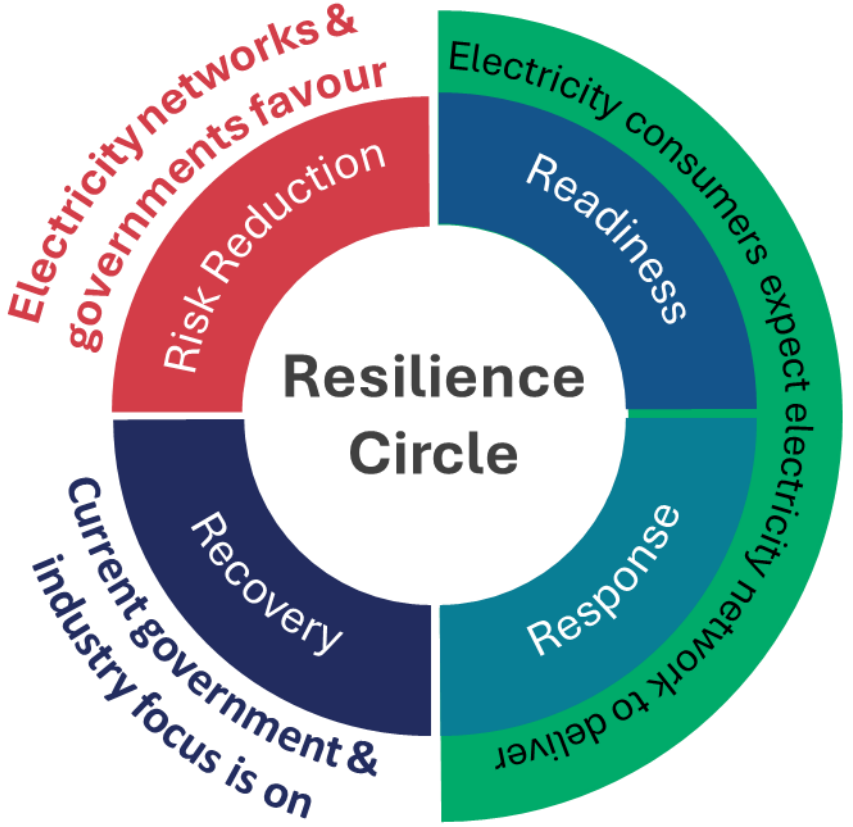
<u>In general</u>
Governments and DNSPs have favoured funding **RECOVERY**

Range of post-event reports demonstrate that consumers favour **RESPONSIVENESS**

Relatively recent shift in the electricity network businesses and governments to **RISK REDUCTION**

No evidence for electricity networks that investment in "resilience" before an event reduces recovery costs.

<u>DNSPs have identified that</u>:
customers that have experienced a prolonged outage favour **RESPONSIVENESS**
Customers that haven't experienced a prolonged outage favour **RISK REDUCTION**



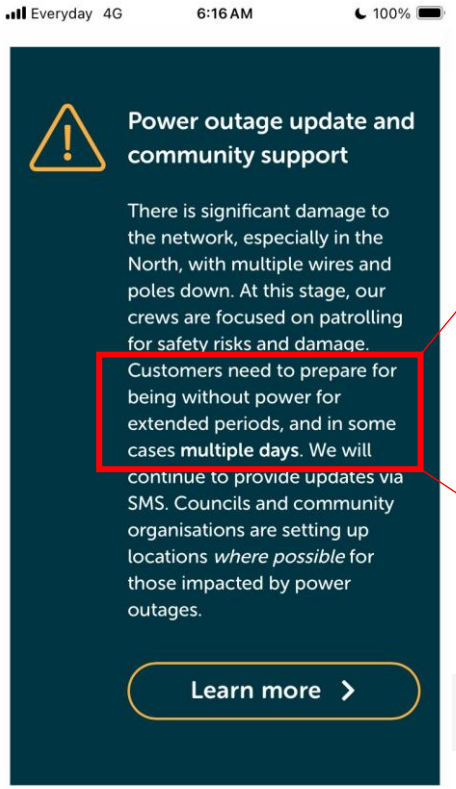
Experiencing bad weather

February 2024

Band of thunderstorms, 500m wide

531,000 without power at peak
30,000 without power after 3 days
3,000 without power after 7 days

Victorian government Network Outage Review



Customers need to prepare for being without power for extended periods, and in some cases **multiple days**

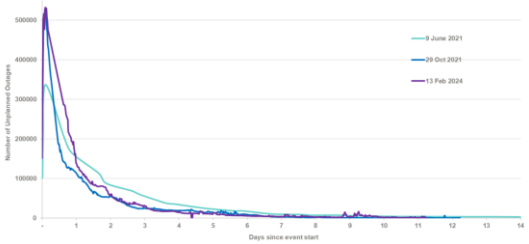
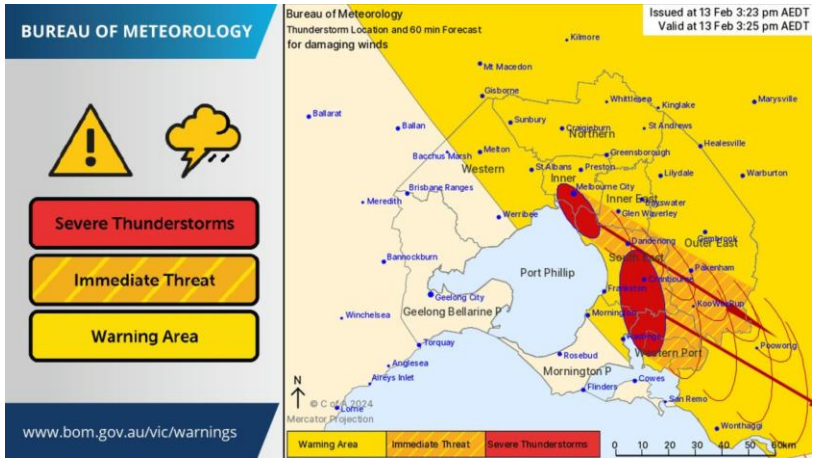
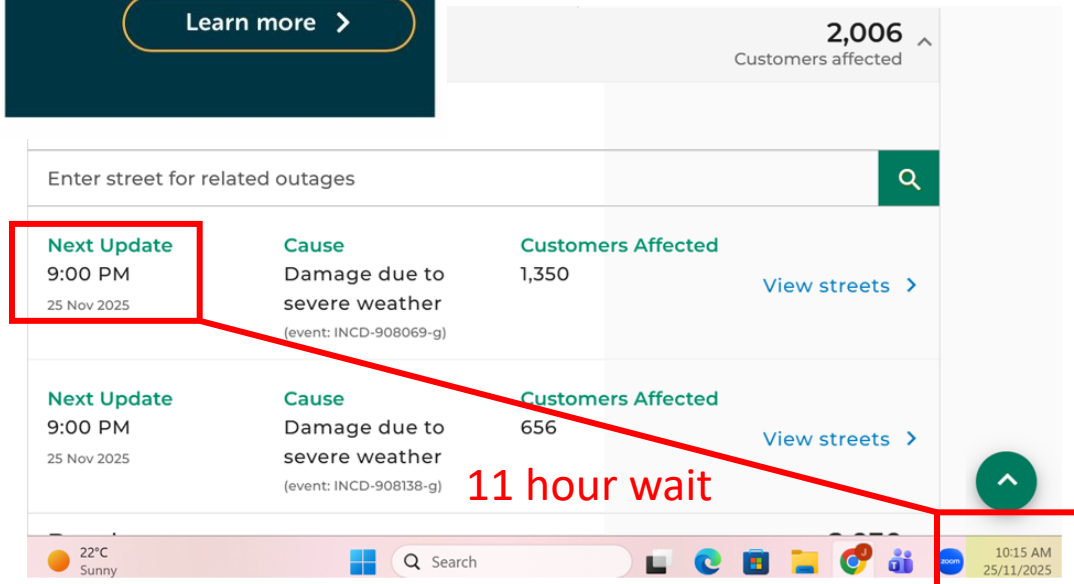


Figure 1: Restoration of customers from the 2021 and 2024 storm events.





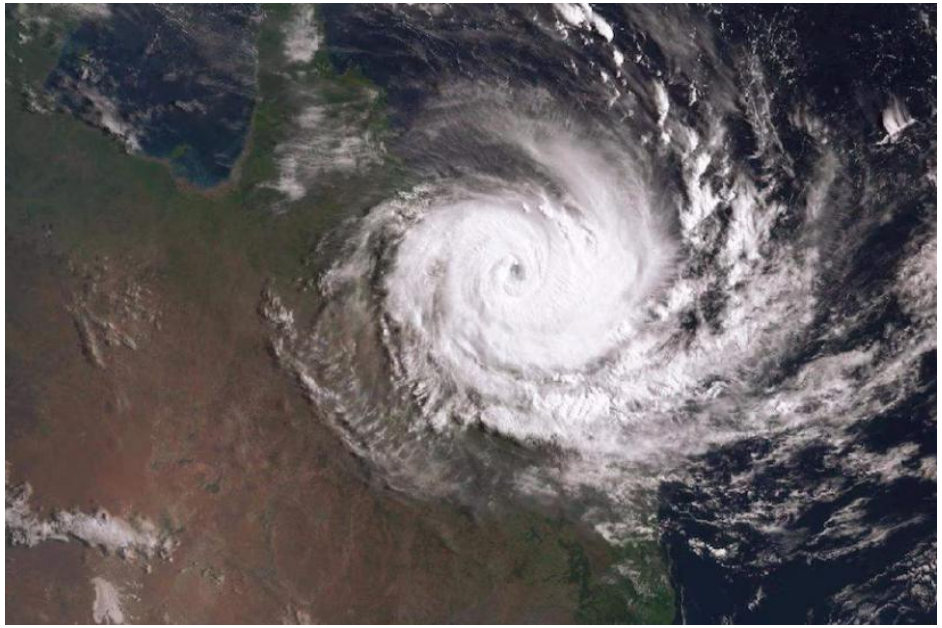
Let’s look at Queensland

Queensland electricity network businesses have had to manage the impact of cyclones

Don’t try to build network that doesn’t fall down, instead

- Mobile equipment
- Community Outreach Major Event Team (COMET)
- Put crews near expected landfall
- Availability of spares
- Regularly practice for severe events
- Formal relationship between Powerlink and Bureau of Meteorology

Prior to 2022, all the electricity network businesses managed the impacts of severe weather under the current frameworks with no need for specific “resilience” investment.



It’s all about trees

Vegetation management is a significant cost for all electricity networks

But

- Trees are important to our sense of place
- Trees are important for the environment and nature
- Trees provide shade and will be increasingly important to adapt to climate change

Note: undergrounding will not mitigate the impact of trees

Summary

Powercor's MERV

Can the grid ever be hardened enough to avoid prolonged outages due to severe weather?

And how much would that cost (capex)?

Climate science cannot predict where severe weather will occur in the future

Not possible to target grid investment to specific locations – agile response (opex)

Crews can only make repairs when it is safe to do so – customers will ALWAYS experience a multiple hour outage as a result of severe weather

Customers increasingly reliant on electricity and this will only increase further with electrification

If we value trees, then we need to think differently about ensuring customers have a resilient supply of electricity

Islandable rooftop PV (plus a battery and/or V2L/V2H) provides resilience

But dependent on DNSPs support the connection of such systems and customers understanding that without "islanding" their rooftop PV won't generate if there is no functional network