Collaboration on Energy and Environmental Markets

Case Studies

Australia's electricity sector: already resilient?

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Comprehensive resilience assessment of electricity supply security for 140 countries

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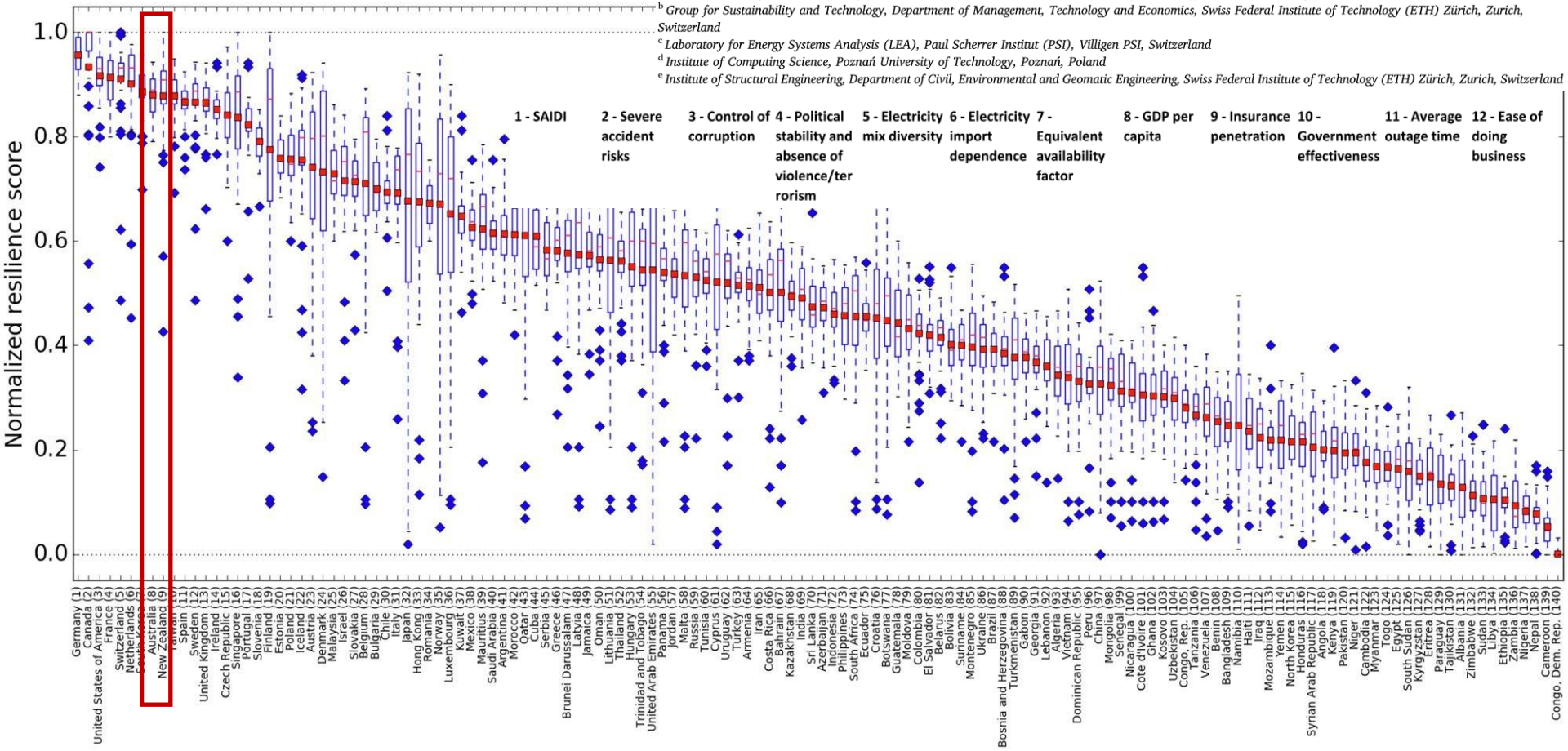
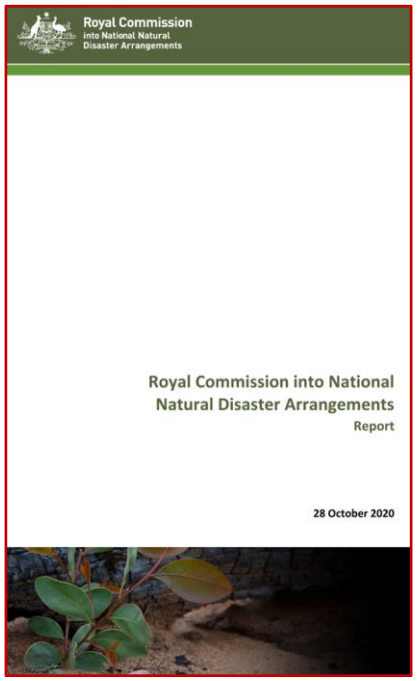


Recently?



Pictured, a composite image made using data from NASA 's satellites that shows where bushfires ravaged the nation between December 5 last year and January 5 2020. The devastating bushfires that ravaged Australia destroyed a fifth of the continent's forests

- A 600 page report that
  - doesn't mention the terms 'community energy' or 'energy resilience'
  - Makes only one mention of stand-alone power systems "*Energy providers agreed that stand-alone power systems would increase network resilience and reduce the exposure of energy infrastructure assets and therefore communities to power outages*"

9.19 Australia's electricity network 'has a large number of very long lines which are expensive to maintain and vulnerable to natural hazards'.[22] Power outages were a widespread cause of cascading failures during the 2019-2020 bushfires. We heard that during the 2019-2020 bushfire season, more than 280,000 customers from various energy providers experienced a bushfire-related power outage at some point.[23] These outages were largely attributed to fire damaging more than 10,000 power poles[24] and thousands of kilometres of powerlines, including those located underground.[25]

> When disasters occur…there can be multiple failures, or failures of multiple assets, leading to cascading impacts, as impact in one aspect of life, sector or service flows on to others.[21]

9.20 These power outages caused significant disruptions to telecommunications services. The Australian Communications and Media Authority's review into the impacts of the 2019-2020 bushfires on the telecommunications network found that, of 888 telecommunication outages observed between December 2019 and January 2020, 779 – or 88% – were caused by mains power outages.[26] In comparison, fire damage

Previously…

- Cable failure due to long-term overloading disconnects Tasmania from Australian NEM for almost 6 months
- Cyclones impacting power in Northern Queensland

Basslink cable fixed, resumption of power link to follow testing next week

By Rosemary Bolger

Posted Wed 8 Jun 2016 at 11:14am, updated Wed 8 Jun 2016 at 1:23pm

…ors supplementing Tasmania's energy supply are no longer needed. *(ABC News: Ellen Coulter)*

Basslink has declared it has successfully reconnected its undersea power cable, almost six months after it failed, allowing Hydro Tasmania to begin sending back more than 80 diesel generators.

The repair crew is now preparing to carry out more tests and bury the cable.

It could be up and running as early as the end of next week if land-based tests confirm it is working as normal, allowing Tasmania to resume importing and exporting power to and from Victoria.

The extended outage added to pressure on already record low Hydro Tasmania dams, requiring the state to rely on diesel generators and a gas-fired power station to meet electricity needs at the height of the crisis.

SBS News

TOP STORIES LATEST US ELECTION CORONAVIRUS AUSTRALIA WORLD VIDEOS | DATELINE INSIGHT THE FEED | SBS HOME

No power for weeks in Cyclone area

Towns in the north of Queensland which have been ravaged by tropical cyclone Yasi can expect to be without pwoer for weeks, the area's energy company says.

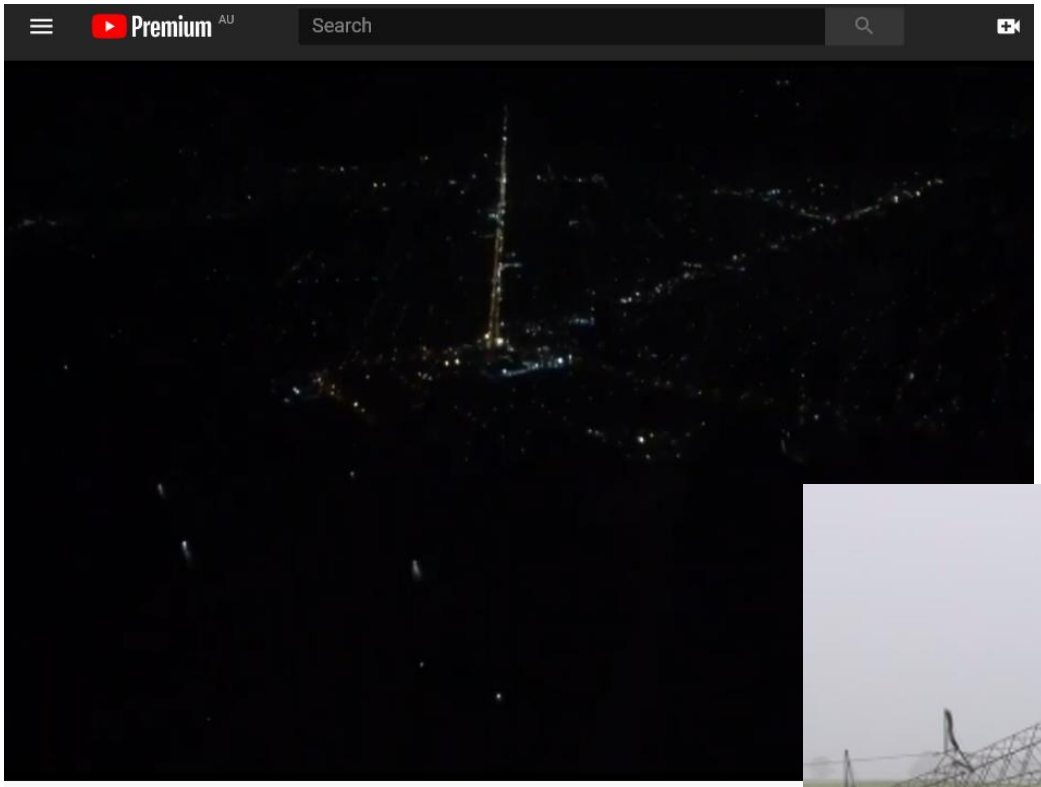
UPDATED 03/09/2013 SHARE

Cyclone devastated north Queensland towns can expect to be without power for weeks, Ergon Energy says.

On Friday, 150,000 customers remained without power from Cairns south to the Whitsundays in the wake of monster Cyclone Yasi.

Previously…

- Extreme weather lightning and wind, NEM operational strategy, incorrect wind farm protection settings combine to black out South Australia



Adelaide blackout from the plane - Sept 2016

… and to come?

DANGEROUS SUMMER:
ESCALATING BUSHFIRE, HEAT AND DROUGHT RISK

2018/19 ANGRY SUMMER

IN JUST 90 DAYS, OVER 206 RECORDS BROKEN, INCLUDING:

- **Record-highest summer temperature:** 87 locations
- **Record-lowest summer total rainfall:** 96 locations
- **Record highest summer total rainfall:** 15 locations
- **Record number of days 35°C or above:** 2 locations
- **National or state/territory hottest on record:** 5 states/territories and (1) Australia.

NORTHERN TERRITORY

- **Hottest summer on record** (2.67°C above average).
- **Rabbit Flat:** 34 consecutive days of 40°C or above.

QUEENSLAND

- **Cloncurry:** 43 consecutive days of 40°C or above (State record).
- **Townsville** received more than annual average rainfall in 10 days (1,257 mm).

WESTERN AUSTRALIA

- **Hottest summer on record** (1.73°C above average).
- **Marble Bar:** 45°C or higher on 32 days during the summer.

NEW SOUTH WALES

- **Hottest summer on record** (3.41°C above average).
- **Bourke:** 21 consecutive days above 40°C (State record).

CANBERRA

- **Hottest summer on record.**
- **35°C or above on 24 days,** five times the summer average.

SOUTH AUSTRALIA

- **Port Augusta:** Hottest temperature this summer - 49.5°C on January 24.
- **Adelaide:** Hottest temperature for January or any month – 46.6°C on January 24.

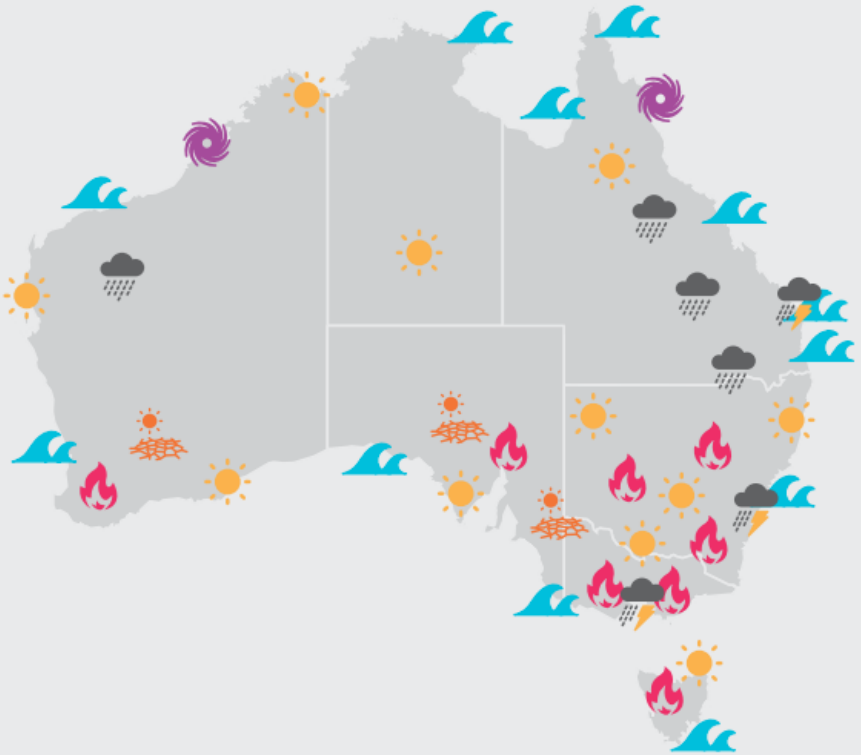
VICTORIA

- **Hottest summer on record** (2.54°C above average).

TASMANIA

- **Driest January on record.**
- **Bushfires burned** ~ 200,000 hectares of vegetation.

HOW WILL CLIMATE CHANGE AFFECT AUSTRALIA?



Cyclones are likely to become **more intense,** but less frequent.

Heatwaves will become even **longer and hotter.**

Potential severe thunderstorm days are **expected to increase.**

Extreme rainfall events are expected to become **more intense.**

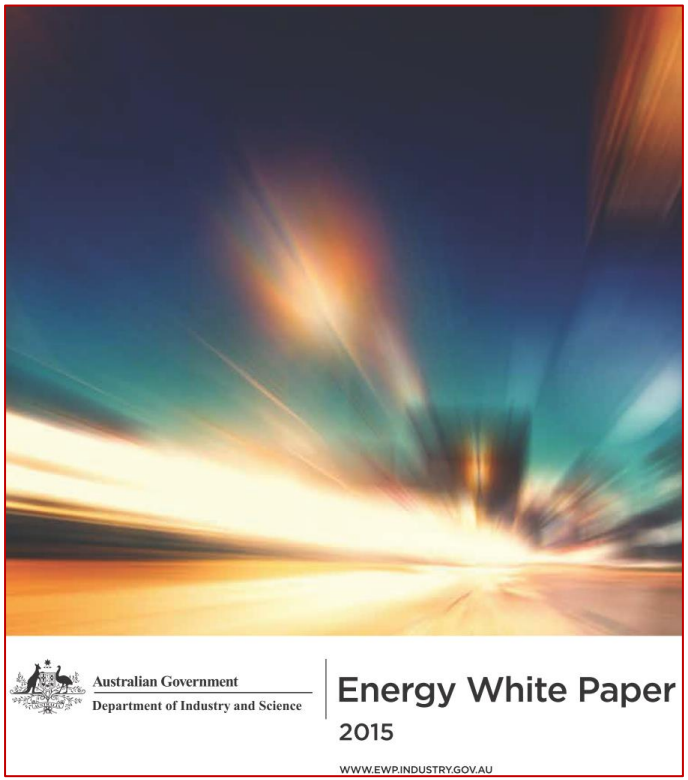
Higher sea levels will **increase flooding** in coastal cities and towns.

Droughts are likely to happen **even more often.**

Hotter and drier conditions will lead to harsher bushfire weather.

Current planning frameworks -National Government

- Federal Government – a focus on energy security
  - 2015 Energy White Paper doesn't mention resilience
  - but growing efforts on resilience wrt critical infrastructure including electricity, gas, liquid fuels



The Australian Government's Critical Infrastructure Resilience Strategy: Plan

INTRODUCTION

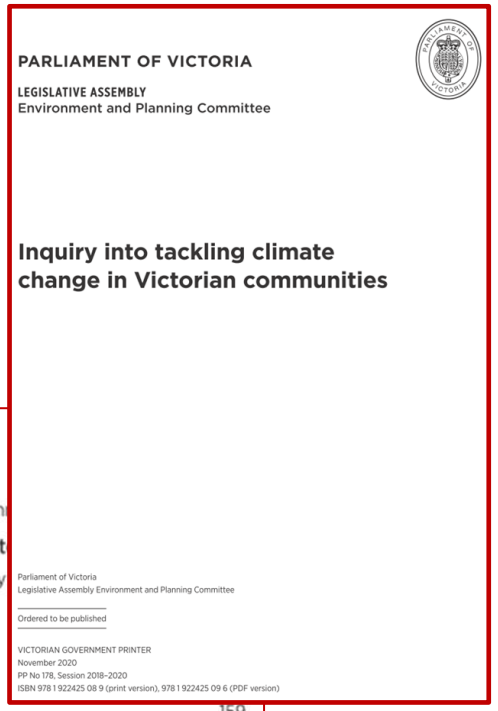
The Australian, State and Territory governments share the following definition of critical infrastructure:

> *'those physical facilities, supply chains, information technologies and communication networks which, if destroyed, degraded or rendered unavailable for an extended period, would significantly impact the social or economic wellbeing of the nation or affect Australia's ability to conduct national defence and ensure national security[1]'.*

The aim of the Australian Government's Critical Infrastructure Resilience Strategy is the **continued operation of critical infrastructure** in the face of all hazards. More resilient critical infrastructure will also help to achieve the continued provision of essential services (provided by critical infrastructure) to businesses, governments and the community, as well as to other critical infrastructure sectors.

Current planning frameworks -State and Territory Governments

- Critical role as key planning jurisdictions
- Key role also in local government capabilities



PARLIAMENT OF VICTORIA

LEGISLATIVE ASSEMBLY
Environment and Planning Committee

Inquiry into tackling climate change in Victorian communities

Parliament of Victoria
Legislative Assembly Environment and Planning Committee

Ordered to be published

VICTORIAN GOVERNMENT PRINTER
November 2020
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ISBN 978 1 922425 08 9 (print version), 978 1 922425 09 6 (PDF version)

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Current planning frameworks -Electricity industry specific actors

- Australian Energy Market Commission – focussed on security but adding resilience to make system security framework:
  - broader – enabling AEMO to consider a wider range of extreme events
  - faster – streamlining the process for AEMO to identify risks and take proactive steps where cost-effective
  - more flexible – enabling AEMO to respond to extreme risks to the power system which were not foreseen in its annual risk review.
- Australian Energy Market Operator
  - resilience now part of the Integrated System Plan in terms of scenario assessments, treatment of risk
- Network Service Providers
  - Work in progress, a new framework for facilitating stand-alone power systems for remote communities under some circumstances


Home / News Centre / Media Releases / New Mechanisms To Enhance Resilience In The Power System: Final

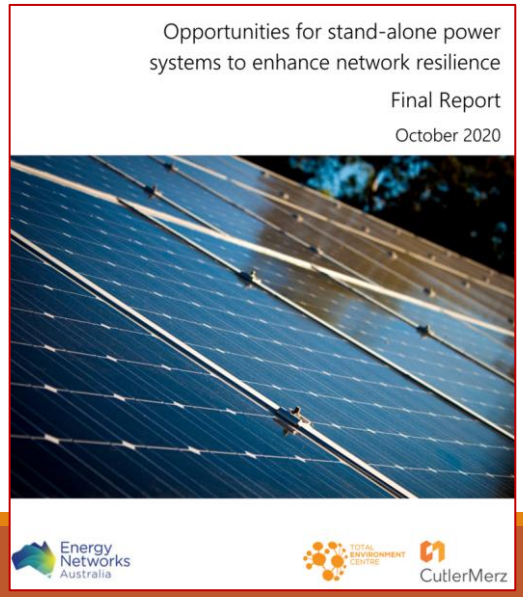
New mechanisms to enhance resilience in the power system: final report

12 December 2019

The AEMC is recommending a range of new mechanisms to better manage risks to grid stability.

The increasing frequency and duration of extreme weather events, along with the changing nature of the generation fleet and rapid growth in consumer-owned distributed energy resources, is creating new challenges to the resilience of the power system.

In a final report on *Mechanisms to enhance resilience in the power system* released today, the AEMC has recommended a range of changes to the power system's security framework to help the market operator, AEMO, manage the risks of extreme events including severe storms.



Another vision for community energy resilience

Community energy movement: Reductions enable Resilience

Even a casual observer of the political debate over climate change in Australia would almost have whiplash from the abrupt turn from low-key climate denialism to focus on resilience and adaptation in the face of climate catastrophes.

FEBRUARY 4, 2020 CAM KLOSE & MATT GROGAN, TOTALLY RENEWABLE YACKANDANDAH

COMMUNITY | ENERGY STORAGE | INSTALLATIONS | OPINION & ANALYSIS | AUSTRALIA

Going 100% RE in a bushfire prone area

Totally Renewable Yackandandah

Image: TRY

Share

Many people are reading Scott Morrison's decision to focus on the 'practical' measures of resilience and adaptation as an acknowledgment emissions reduction are too hard for his government.

Scott Morrison is correct: our communities do need to build resilience against the impacts of climate change. Undoubtedly, this statement is cold comfort for bushfire affected communities that have no choice but to find resilience as the painstaking task of rebuilding.

But resilience is a trait that will be needed in spades in a harsher climate.

Rather than let this focus on resilience be another distraction from the urgent need to decarbonise our economy, we can seize it for a mass community-driven deployment of renewable energy across the country.