

2022-23 Summer Readiness

Industry Briefing
29 November 2022

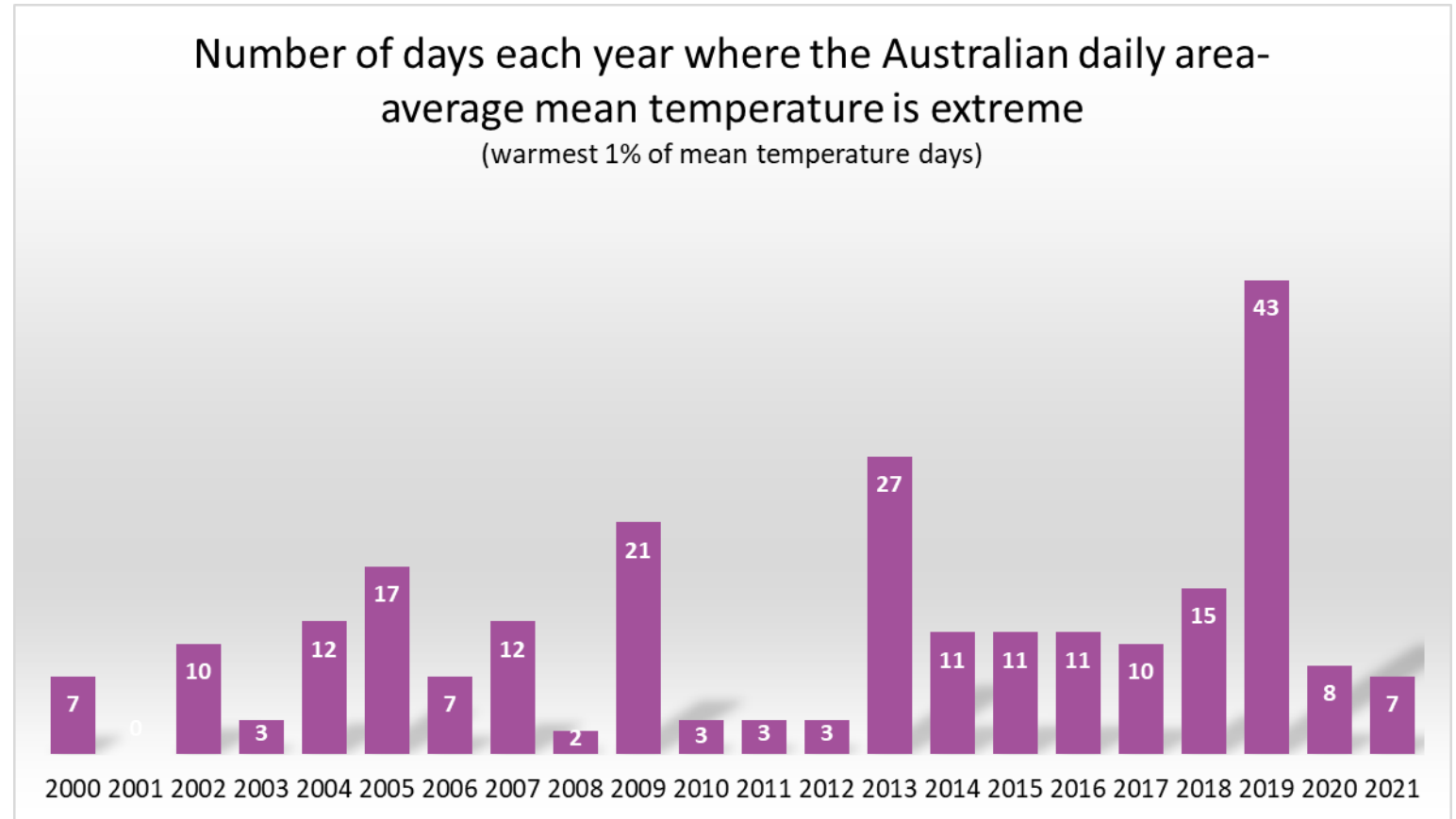


Agenda

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6. Generation Capacity
7. Gas Supply Adequacy
8. High Impact Outages & Network Augmentations
9. Reliability Emergency Reserve Trader
10. Minimum Operational Demand
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12. Comms and Stakeholder Engagement
13. Network and Generation Risks/Issues

2021-22 Summer Recap

















- La Niña conditions returned in November 2021 and lasted until June 2022.
- November 2021 was Australia's wettest November since national records began in 1900.
- Eastern Australia saw significant widespread flooding in March and November.
- 2021-22 summer was the hottest summer on record across the Greater Perth region.
- Overall, 2021 was Australia's coolest year since 2012 with low number of extreme daily average temperatures (similar to 2020).



Source: Bureau of Meteorology

October 2022 to April 2023: Severe Weather Outlook

- La Niña event declared on 13 September. Neutral conditions may return in early 2023.
- La Niña increases the chance of above average rainfall in eastern Australia.
- Widespread flooding and tropical cyclones are more likely in the eastern states.
- Southwestern WA and Western Tasmania are likely to be warm and dry.
- Elevated fire risk for western and inland Australia.

Impact	Likelihood compared to recent decades
 Widespread flooding	 More likely for eastern Australia
 Coastal flooding	 More likely eastern and northern Australia
 Severe storms	 Similar
 Bushfire risk	 More likely for western and inland Australia
 Heatwave	 More likely for western Australia
 Tropical Cyclones	 Above average seasonal activity likely
 Drought	 Less likely apart from SW WA and W Tas
 Dust	 Less likely

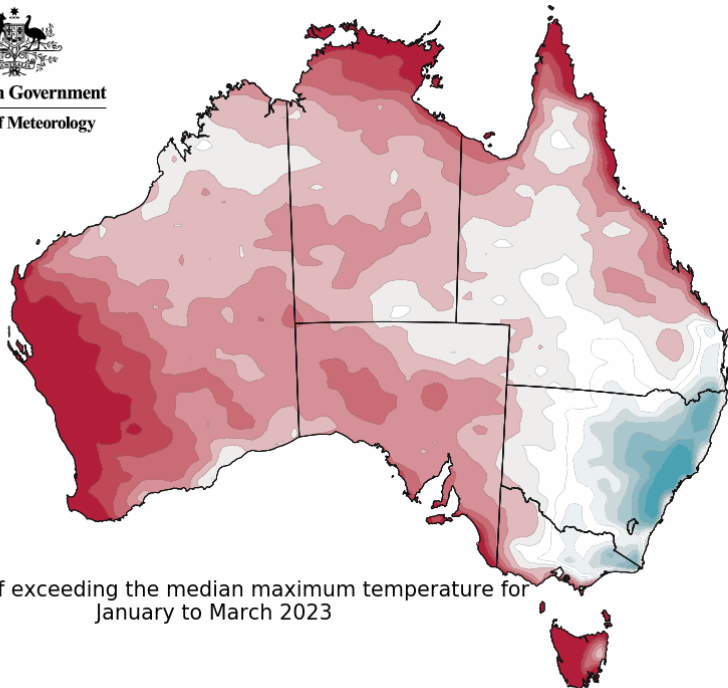
Source: Bureau of Meteorology

January 2022 to March 2023: Climate Outlook

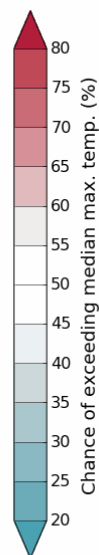
Climate expectations are similar to the conditions observed in 2021

Maximum temperatures


Australian Government
Bureau of Meteorology



Chance of exceeding the median maximum temperature for
January to March 2023



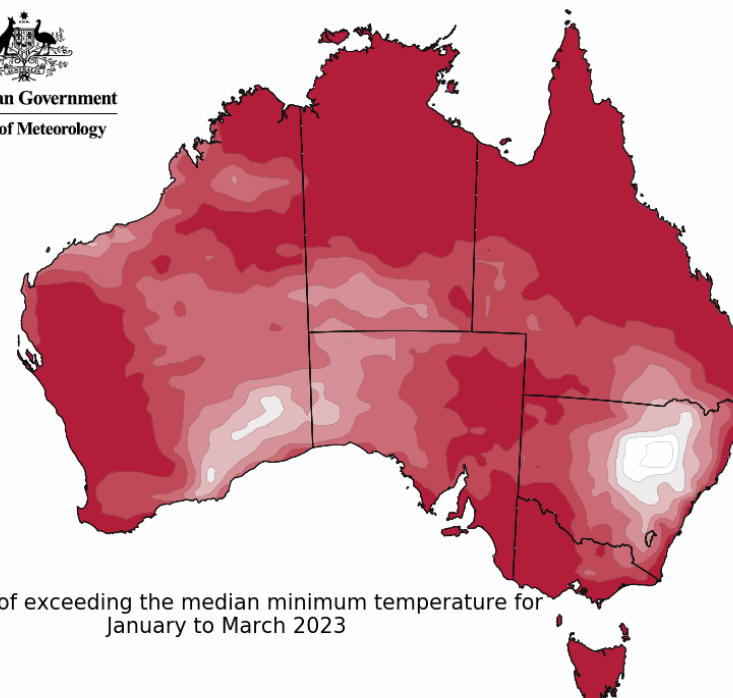
Model run: 21/11/2022
Issued: 24/11/2022

Model: ACCESS-S2
Base period: 1981-2018

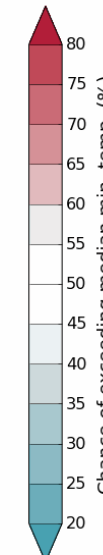
Maximum temperatures are likely to be above median for Tasmania and WA. Cooler than median days are likely across NSW and northern Vic.

Minimum temperatures


Australian Government
Bureau of Meteorology



Chance of exceeding the median minimum temperature for
January to March 2023



Model run: 21/11/2022
Issued: 24/11/2022

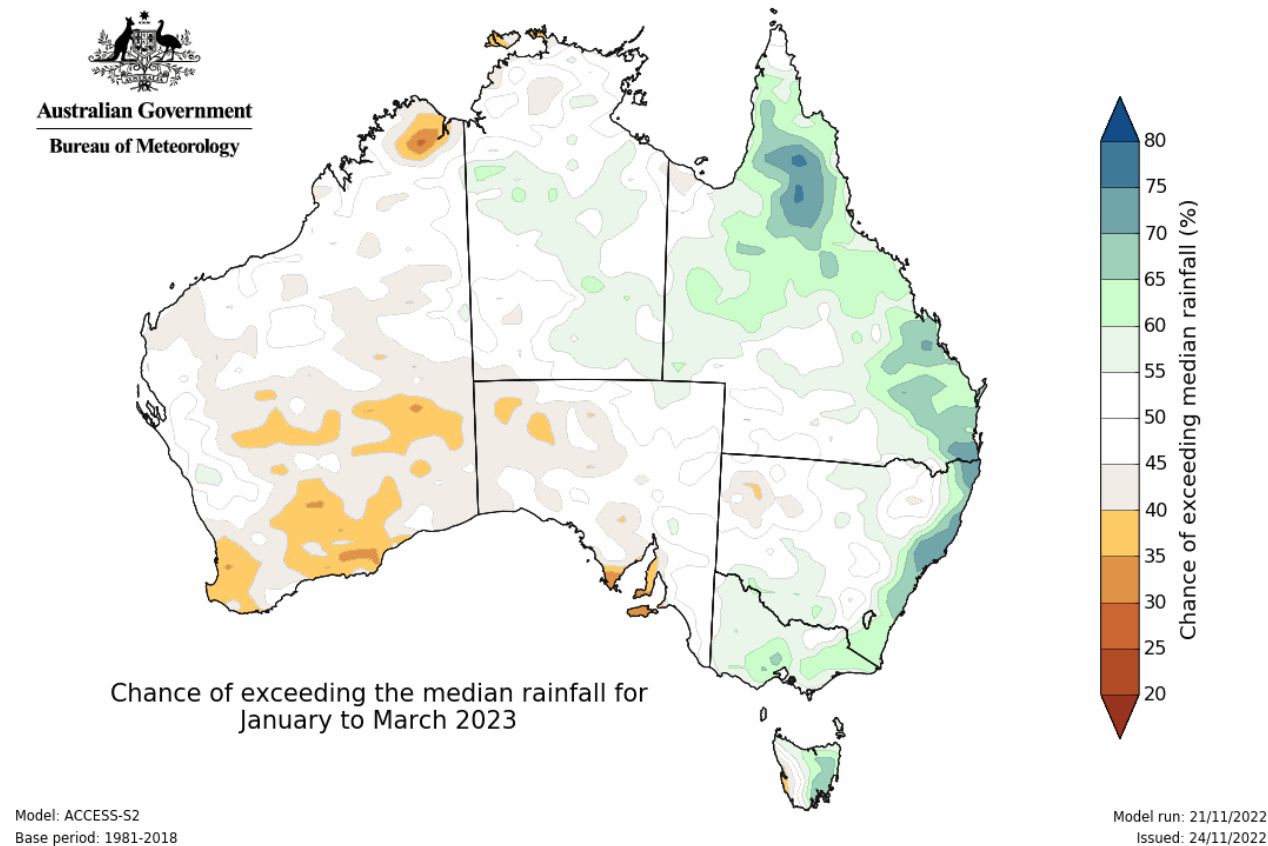
Model: ACCESS-S2
Base period: 1981-2018

Minimum temperatures are generally likely to be warmer than median.

January 2022 to March 2023: Climate Outlook

Rainfall

- Near to above-median rainfall likely for most regions apart from areas of WA, SA and western Tasmania.
- Soils remain wetter than average across much of eastern Australia, including Tasmania.
- Most water storages are at higher levels than this time last year.
- Above median rainfall expectations increase the potential for cloud cover dampening the output of rooftop PV and grid scale solar generation.

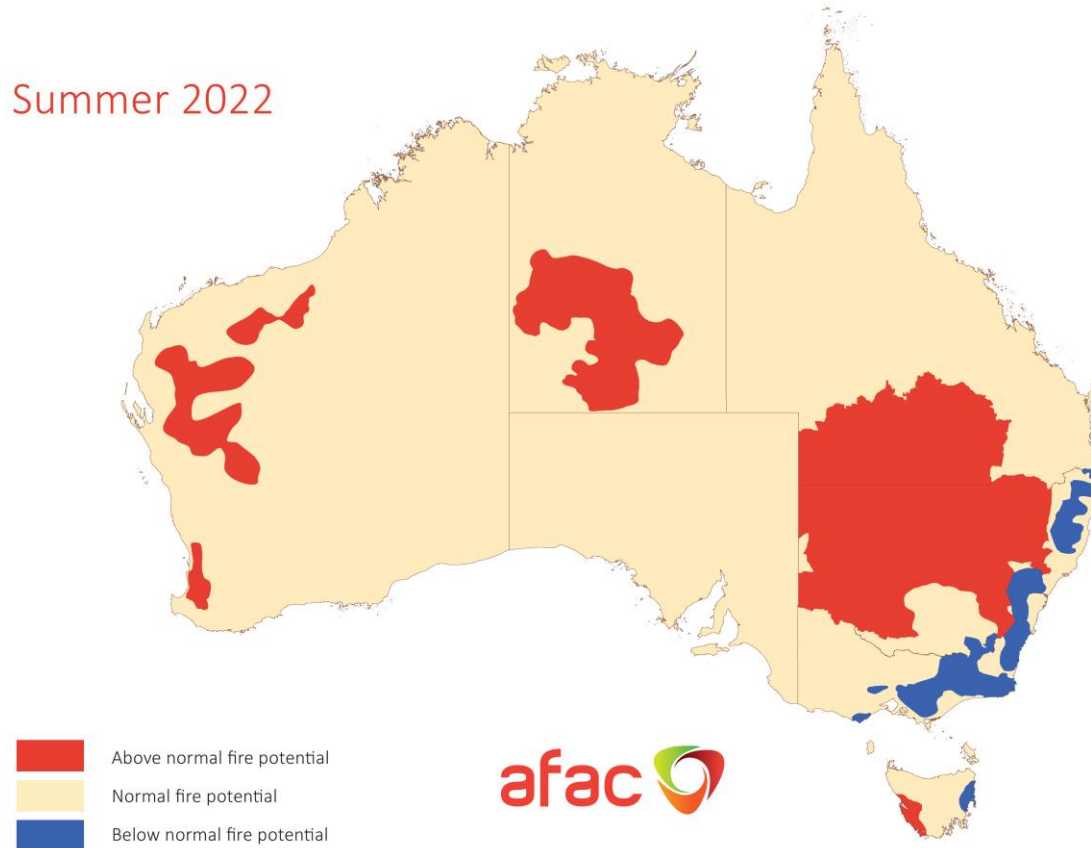


Summer Bushfire Outlook

Bushfire Risk

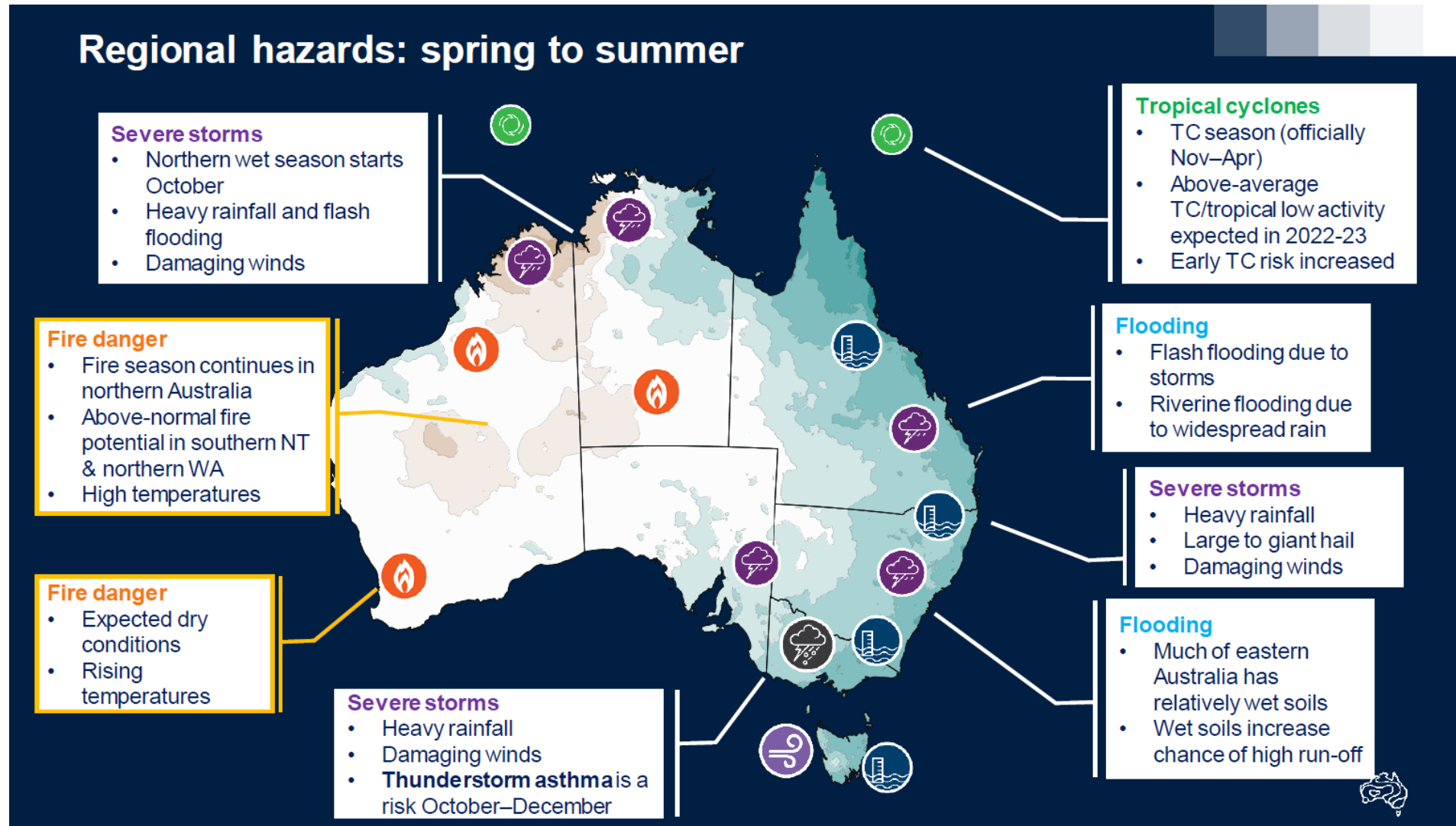
- Elevated fire risk in parts of Western Australia and western Tasmania.
- Grassfire risk increasing through summer in NSW and southern Qld when abundant vegetation cures.
- Lower than average risk in coastal south-eastern Australia.

Summer 2022



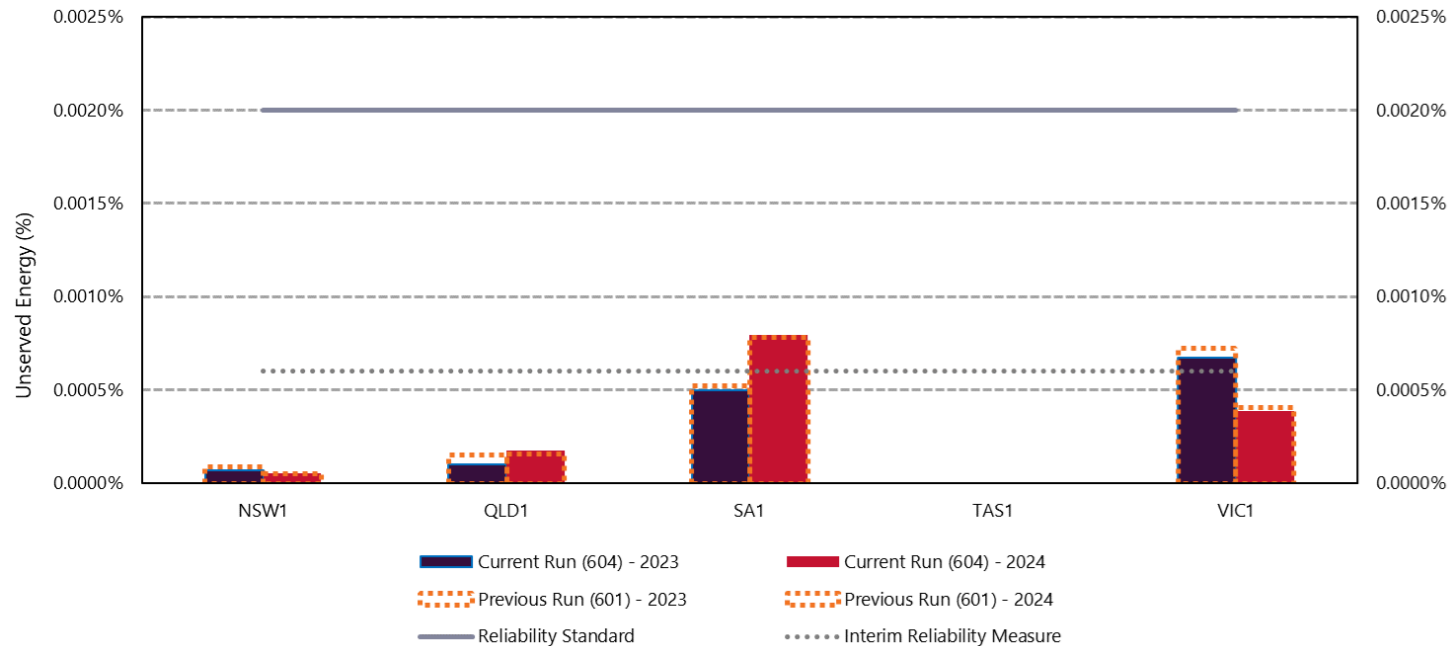
Regional Hazards: Spring to Summer

Source: Bureau of Meteorology



Supply Adequacy Outlook

MT PASA Results Run No 604 – 29 November 2022



- Expected Unserved Energy (USE) over the 2022-23 summer in QLD, NSW, SA and TAS is forecast to be within both the Interim Reliability Measure (IRM) of 0.0006% USE, and the reliability standard of 0.002% USE.
- USE over the 2022-23 summer in VIC is forecast slightly above the IRM USE threshold (0.0007% USE).
- Risk of load shedding remains across most regions where high demand coincides with generator forced outages and/or very low VRE. Loss of Load Probability (LOLP) study highlights the level of risk through summer months, available through the Markets Portal <https://portal.prod.nemnet.net.au/>.

Generation Capacity

- Approximately 1000 MW of additional capacity in the NEM compared to previous summer.
- Hydro generation:
 - Limited by water licence, dam levels, available airspace, and riverbank capacity.
- Coal generation:
 - Building up coal stock for summer. Heavy rainfalls in eastern states have the potential to impact coal quality/deliveries.
 - Several major units are on forced outage with possibility of delayed return to service:
 - Yallourn 4 (360 MW) – 4 Dec 2022 (VIC)
 - Kogan Creek (720 MW) – 18 Dec 2022 (QLD)
 - Callide C3 (300 MW) – 11 Feb 2023 (QLD)
- Gas/diesel generation:
 - Constraint on gas usage revoked.
 - Bolivar (108 MW) – commissioning delayed to 23 Dec 2022 (SA)

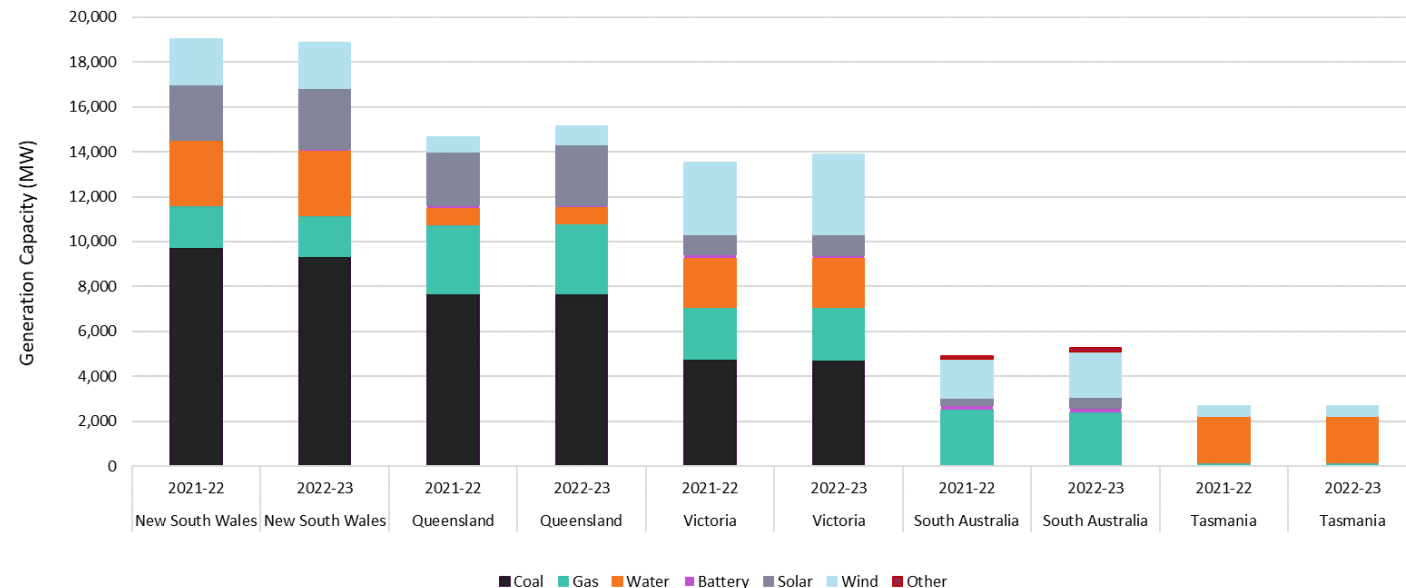
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Significant Generation Changes

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Region	Capacity (MW)
NEM	1500 MW – Wind and Solar
QLD	Swanbank E (360 MW) - back in operation

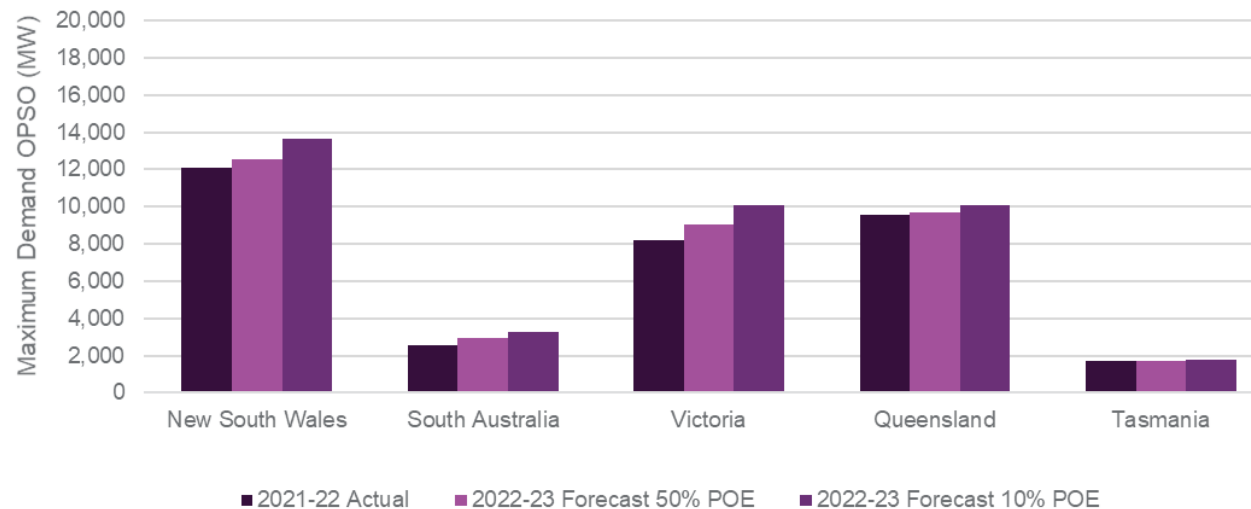
Region	Capacity (MW)
NSW	Liddell 3 (430 MW) - retired
QLD	Callide C4 (420 MW) - long term outage



Source: ESOO 2022 - available capacity during typical summer conditions by generation type.

Maximum Operational Demand

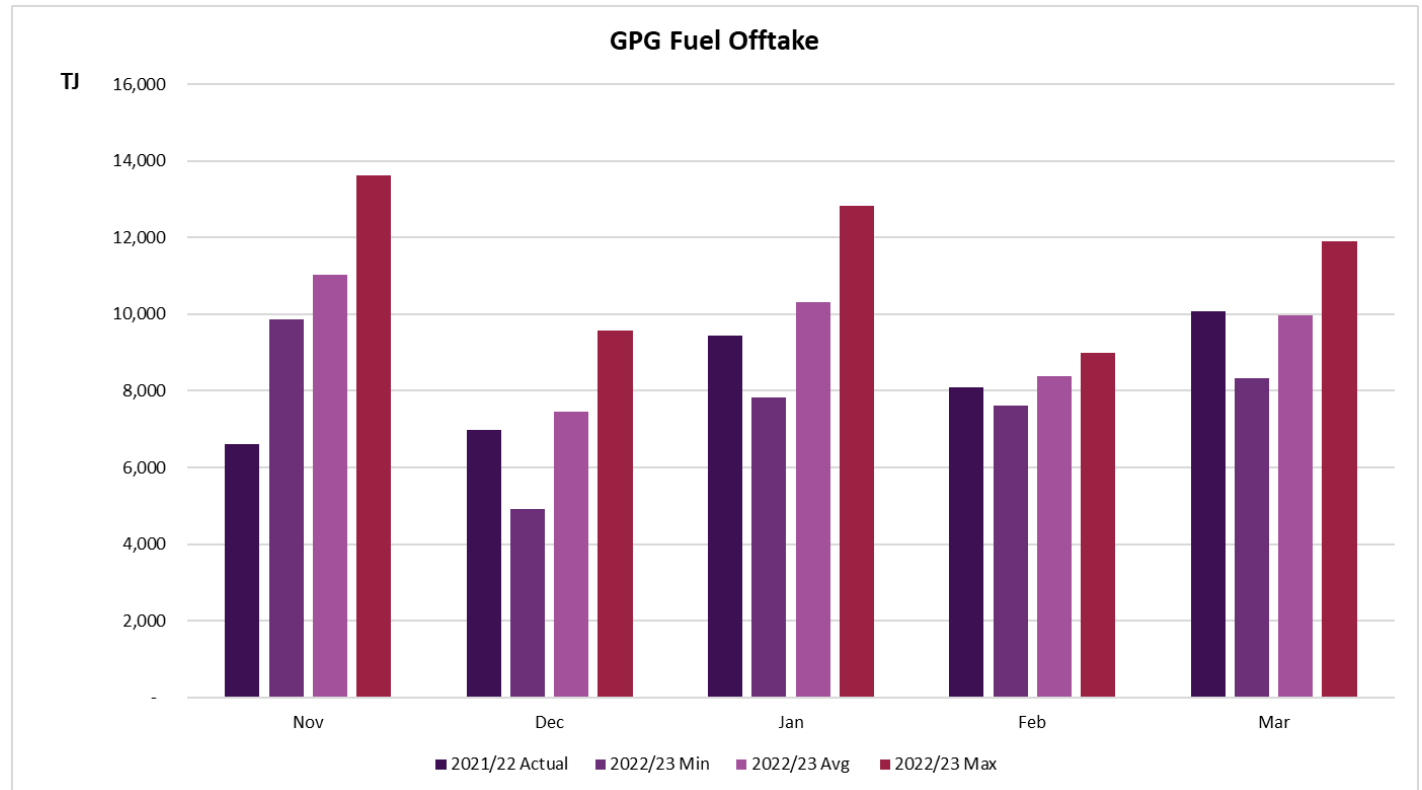
NEM ESOO 2022 – Operational demand (sent-out)



- Industrial customers, particularly in South Australia and Victoria, have indicated increasing production commitments in coming years, leading to consumption (and demand) increases.
- Electrification, particularly of businesses, and take-up of EVs are the primary drivers of operational consumption growth across the NEM.
- Maximum demand periods are forecast to frequently occur outside daylight hours in all regions. This reduces the impact that distributed PV uptake has on the forecast, relative to other fundamental drivers of growth such as new connections or appliance uptake.
- Some major industrial loads provide load curtailment at times of high market prices which can reduce maximum operational demand.

GPG Supply Adequacy

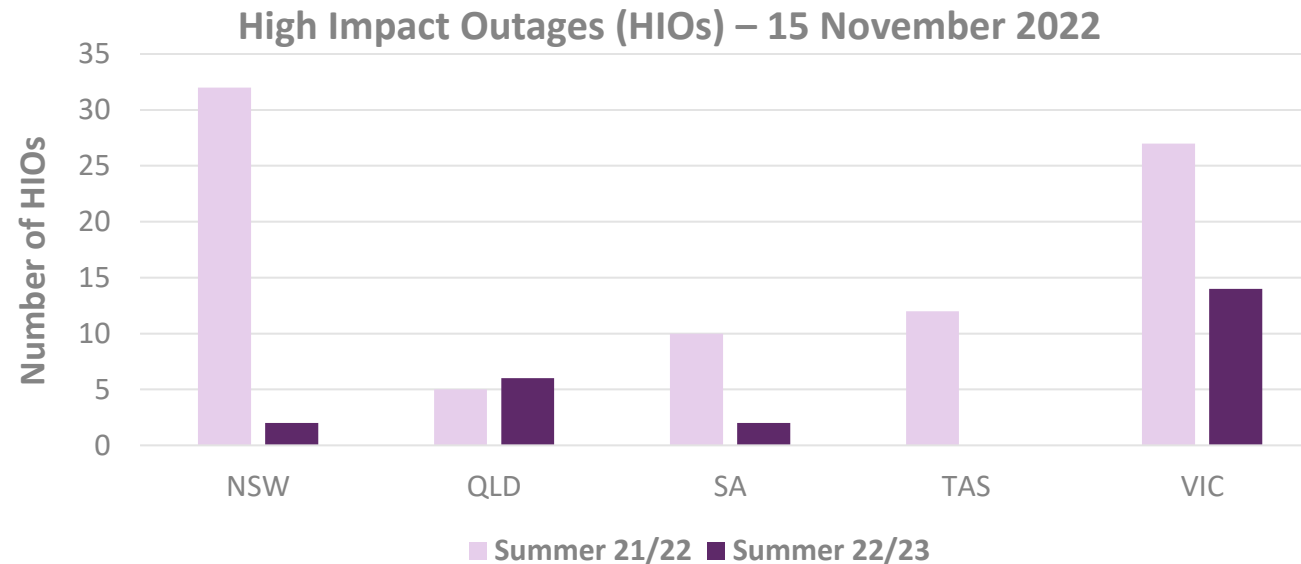
- Average forecast consumption for NEM during 2022/23 summer is similar to Actual consumption levels in 2021/22 summer except for November where higher consumption is forecast.
- Government signed Heads of Agreement with East Coast LNG Exporters: “to prevent a gas supply shortfall and secure competitively priced gas for the domestic market”.
- Refilling of Iona storage is on-going.
- Longford maintenance, capacity at 50% from mid Jan to mid Feb 2023. Gap to be covered from other sources including Iona.



Source: AEMO NEM GPG Forecasts using Step Change scenario with NEM demand & VRE generation following reference years 2011, 2014, 2015, 2017 and 2019.

High Impact Outages & Augmentations

- Number of Planned HIOs have decreased, however available data underestimates planned transmission outages, due to possibility of late submissions.
- VIC HIOs relate to maintenance on 500 kV lines between Moorabool and South Morang in early Dec and late Mar.
- QLD outages relate to augmentations around Strathmore during March 2023.



Inter-regional augmentations:

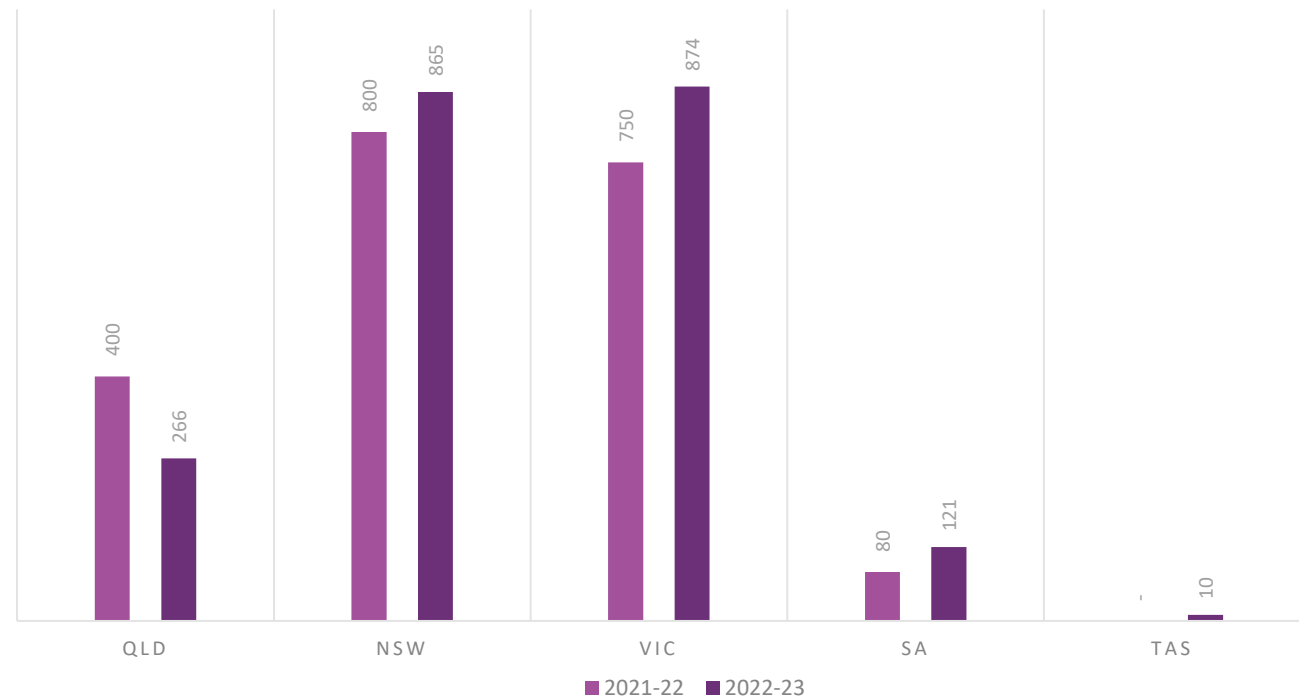
- QNI Minor upgrades:
 - Additional 100 MW NSW to QLD capacity by this summer.
 - Further 100 MW NSW to QLD and 100 MW QLD to NSW capacity by March 2023.
- VNI Minor upgrades:
 - Vic to NSW thermal capacity to increase by 40 MW (end of Q1 2023).
 - Full market benefit (170 MW) to be realised when Project EnergyConnect and West Murray Renewables Link projects are complete.

Note: QNI and VNI capacity increases are dependent on completion of the commissioning tests influenced by prevailing market conditions.

Reliability Emergency Reserve Trader (RERT)

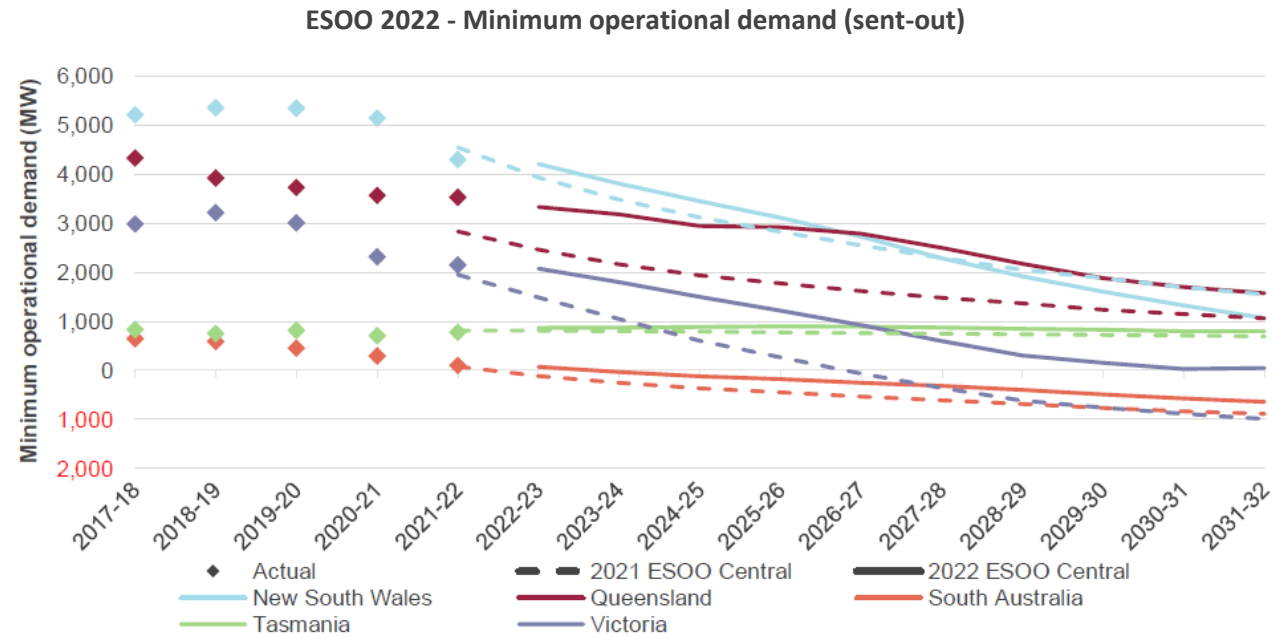
- AEMO’s 2022-23 summer outlook forecasts unserved energy to remain below the reliability standard for all regions.
 - The latest MT PASA forecast Victoria USE to marginally breach the IRM.
- To mitigate any potential reliability risks AEMO maintains a panel of suppliers that can provide / contract reserves at short notice – the short notice RERT panel.
- Current estimation is contribution from RERT will increase from last year across most regions. Procurement is currently progressing and is still being evaluated.

CHANGE IN MAXIMUM AVAILABLE SHORT NOTICE RERT



Note: Further capacity in TAS is being sought and contracted.

Minimum Operational Demand (NEM)



- No forecast security issues during minimum demand periods in 2022-23 summer with the system intact. Minimum demand issues could arise across Christmas and New Year period, weekends, public holidays. Minimum System Load (MSL) framework available to increase load if security issues arise.
- Minimum operational demand is forecast to occur in the middle of the day in all mainland regions when solar irradiance and maximum capacity factors increase to the highest levels, therefore increasing rooftop PV generation (1900 MW increase compared to last summer).
- For next year, forecast minimum operational demand in 2022-23 is higher in all regions than in the 2021 ES00, due to higher projections for electrification and increased operation from Large Industrial Loads (LILs). With the projected sustained uptake of distributed PV, minimum demand forecasts continue to show a rapid decline.

Summer Plan & Response Capability

1. Prepared resources
 - Generation availability, including fuel
 - Transmission availability
 - RERT
 - Gas Supply Guarantee
2. Operational Improvements
 - Training
 - Processes
3. Contingency Planning and Emergency Management
4. Communications and Stakeholder Engagement

Comms and Stakeholder Engagement

Pre Summer

- Targeted Parts of Industry
 - TNSPs/Generators
 - ACCC interim authorisation
- Jurisdictional Engagement
 - Briefing
 - Emergency Exercise
- Whole of Industry
 - Summer Readiness Industry Briefing
- Other
 - As requested

During Summer

- Regular Briefings – jurisdictional and industry
- Use of digital platforms, Media engagement

Network and Generation Risks

Risks	Mitigation
Network and generation forced outages exceeding limits historically observed.	<ul style="list-style-type: none"> • Overall generation availability has improved compared to 2021/22. • AEMO is monitoring generation availability across all regions. • RERT Panel.
Network and generation outages / commissioning activities extending beyond target completion dates.	<ul style="list-style-type: none"> • AEMO is working closely with TNSPs and Generators to understand delays/modifications to planned maintenance due to resourcing issues, COVID restrictions or other reasons.
COVID-19 restrictions impacting planned generation and network outages, generator commissioning.	<ul style="list-style-type: none"> • COVID-19 impacts are currently minimal. • Risk managed through ACCC interim authorisation maintenance co-ordination for QLD, NSW and VIC. • Relaxed summer transmission outage guideline for improved management of outages across all seasons.
Increased storm and flooding impacting coal supply and transmission in the NEM. Major floods in Murray-Darling basin impacting network or generation.	<ul style="list-style-type: none"> • Contracting coal from diverse sources and building up coal stock for summer and beyond. Monitor coal generation availability and stockpile levels. • Working through the impact and duration of separation event in Tasmania (north-south split) on 14 October 2022. • Monitor risks with asset owners.
Bushfires impacting fuel supplies (coal or gas production), generation or network assets.	<ul style="list-style-type: none"> • Monitor risks with asset owners. • Contingency plans in place.
Unplanned network events during low demand periods.	<ul style="list-style-type: none"> • Contingency plans in place.

Network and Generation Issues

Issues	Impacted Region(s)	Impact
Planned transmission outages could occur during summer - maintenance of damaged lines near Snowy.	NSW, VIC	Reducing supply from Snowy.
VNI and QNI capacity increase - commissioning tests dependant on market conditions.	QLD, NSW, VIC	Potential delays to VNI and QNI capacity increases.
Tasmania region separation event (north-south split on 14 October) – potential delays to lines restoration beyond 2 nd December 2022.	TAS, VIC, SA	Reduced Basslink transfer to Victoria. Unable to share capacity reserves between north and south Tasmania.
Mintaro PS unavailable until mid-March 2023. Jeeralang B1 unavailable until end of Feb 2023.	SA, VIC	Increased risk of USE and potential for increased GPG generation. Reduction in system strength.
Kogan Creek and Callide C3 return to service may extend beyond scheduled return to service dates.	QLD	Increased risk of USE and potential for increased GPG generation. Reduction in system strength.
Para SVC 2 is out of service until August 2023.	SA, VIC	Constraint on Heywood interconnector.
South Morang 330 kV series capacitor banks are out of service until end of Jan 2023.	NSW, VIC, SA	Constraint on VNI interconnector.



For more information visit

aemo.com.au