



Summer Outlook

AEMO

Ashleigh Lange- Head Communications Meteorologist

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weatherzone°

Summer 2020/2021

SUMMER MEAN Temperature



↑ 0.6°C
Above Average

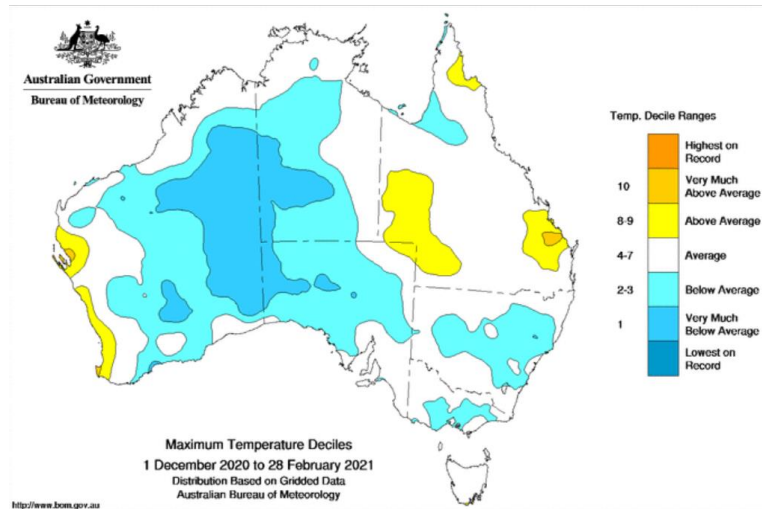
- La Niña from late-Sep20 to late-Mar21.
- Rainfall was 29% above average.
- NSW had its wettest and coolest summer in 9 years.
- SA coolest summer in 19 years.
- NSW Total fire bans on 11 days, 2019/20 saw 60 days.



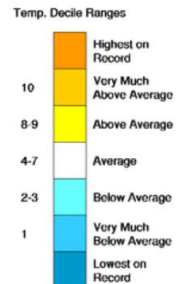
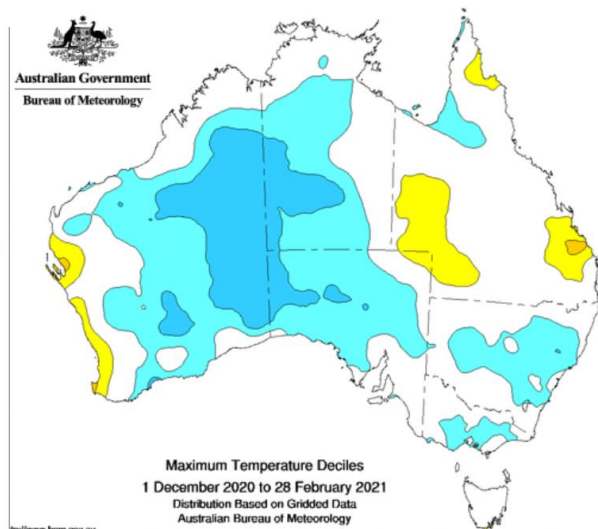
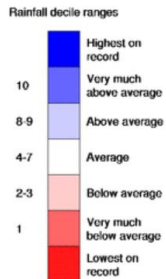
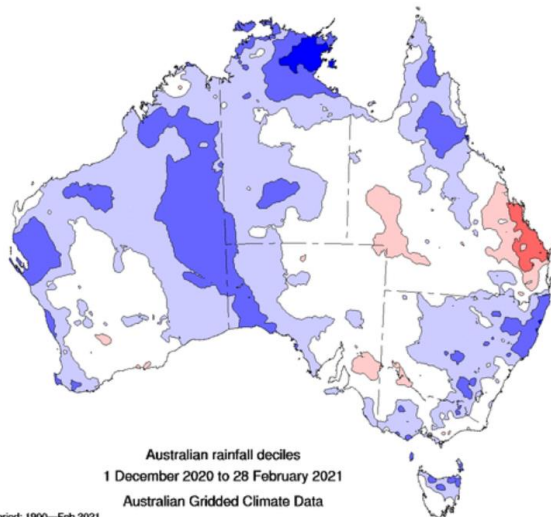
Max Temperature -0.28 °C



Min Temperature +0.39 °C



Summer 2020/2021

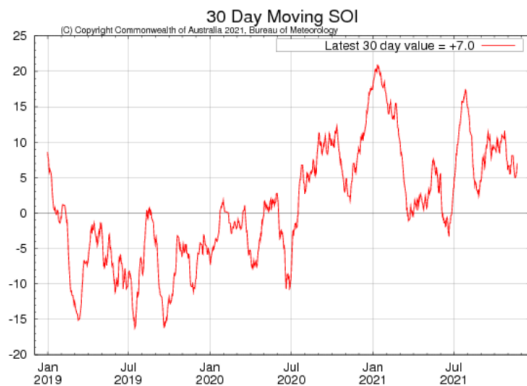
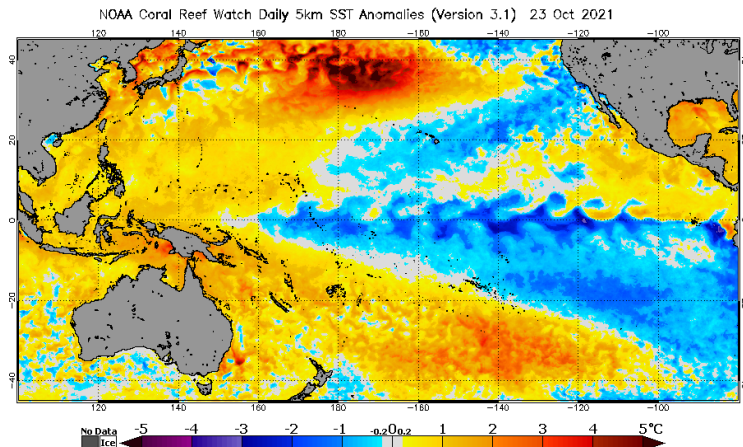
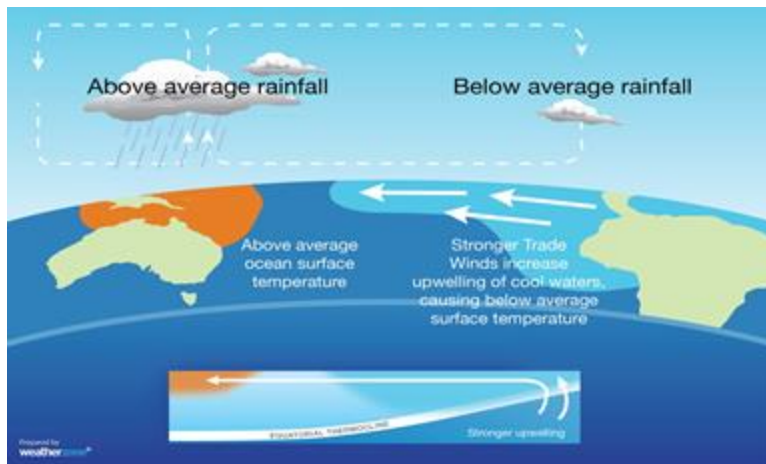


Overview

State of the climate

Outlook

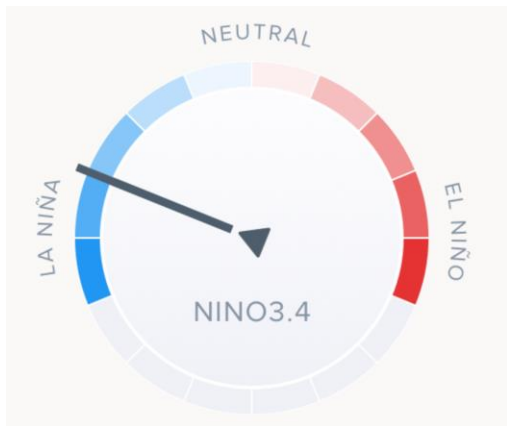
El Nino-Southern Oscillation



La Niña thresholds have been met after continued cooling of sea surface temperatures (SSTs) across the equatorial Pacific.

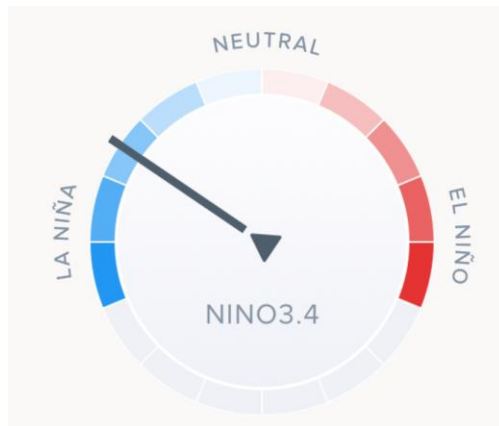
ENSO Outlook - NINO3.4 Index

Current International Consensus



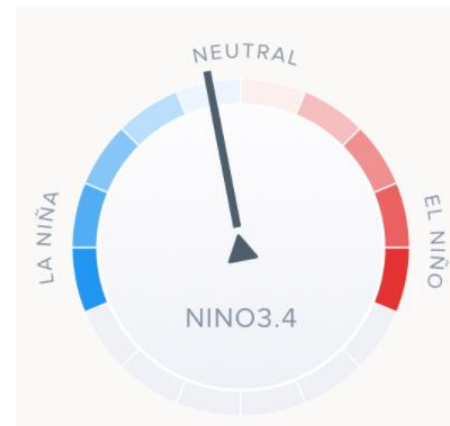
DEC

-1.1 Index



FEB

-0.9 Index



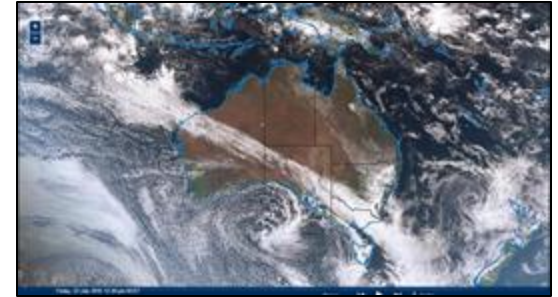
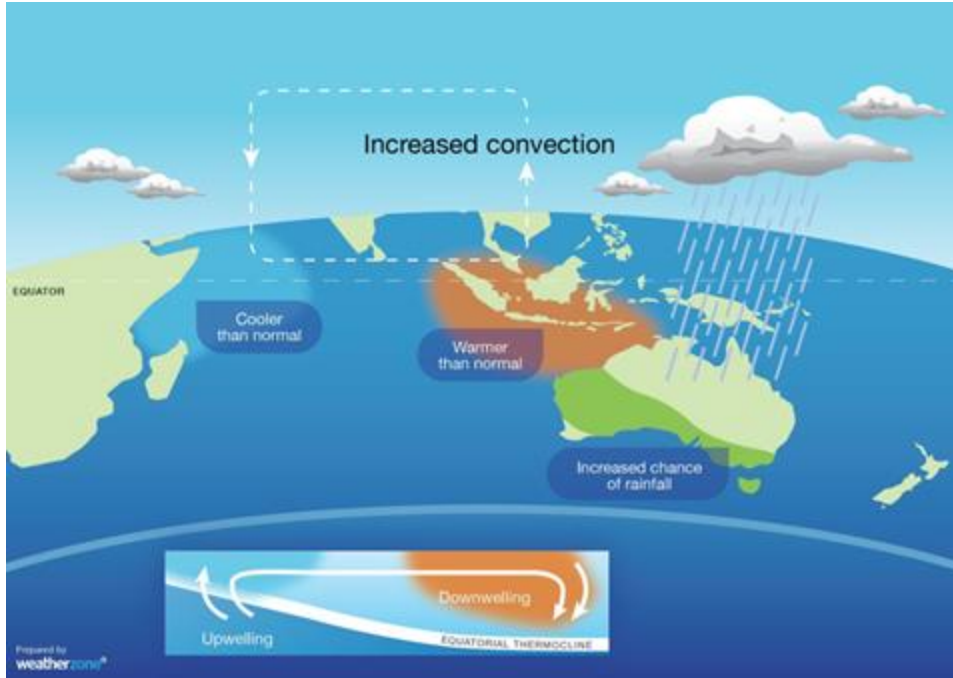
APR

-0.4 Index



For a La Niña (-0.8) or El Niño (+0.8) to be declared, thresholds need to be met for at least 3 consecutive months.

Indian Ocean Dipole (IOD)

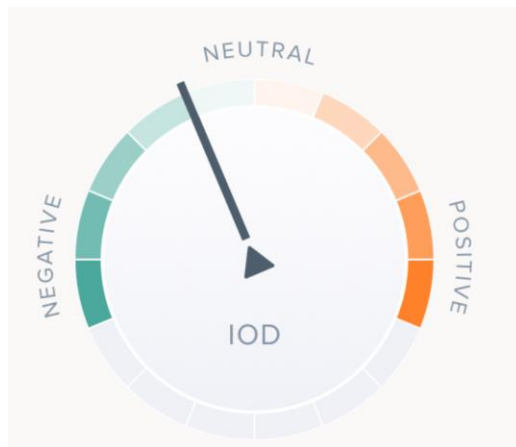


Negative IOD:

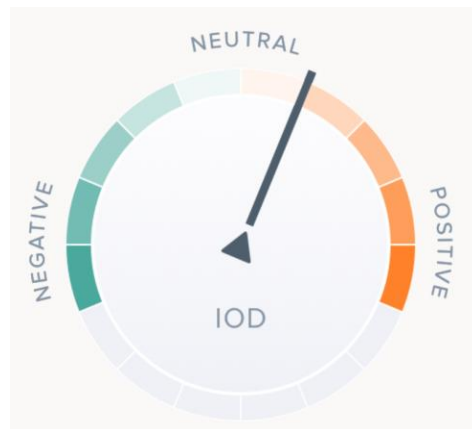
- SST gradient across the Indian Ocean
- More moisture in the NW
- Increased rainfall across central and southeast AUS
- Increased numbers of NW cloudbands

IOD Outlook - DMI Index

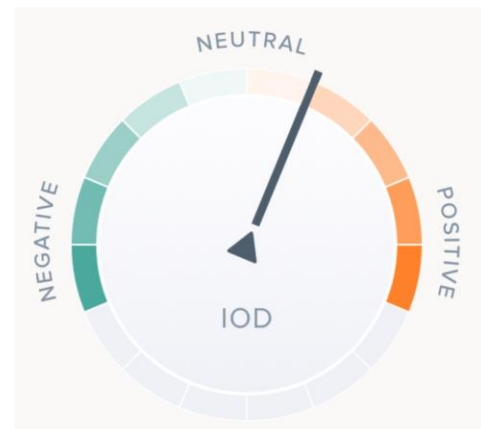
Current International Consensus



DEC
-0.1 Index



FEB
+0.2 Index

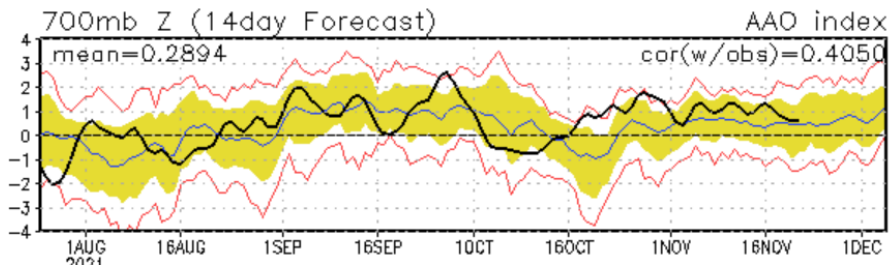


APR
+0.2 Index

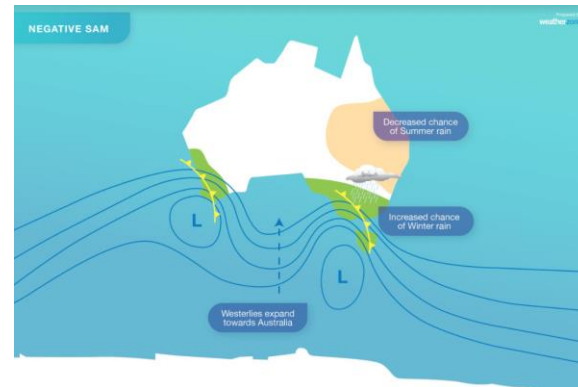


For a **Negative** (-0.4) / **Positive** (+0.4) to be declared, thresholds need to be met for at least 3 consecutive months.

Southern Annular Mode (SAM)



A strong polar vortex over Antarctica earlier to make positive SAM phases more likely until at least December.



Wind events



- Strong wind events less frequent in southern Australia until at least Jan.
- Driven by positive SAM and potential La Nina
- Although cold fronts and storms are still likely to move through, causing strong wind events.
- Second half of summer into early autumn could see more periods of negative SAM.

Climate Summary

ENSO = La Nina.

SAM = Positive to neutral, positive phases more likely until at least Dec.

SSTs = Warmer in the north.

IOD = Neutral, recently returned from negative phase.

Outlook

A solid blue vertical bar is positioned to the left of the word "Summer".

Summer

National Outlook - DJF

Maximums



Minimums



DECILES



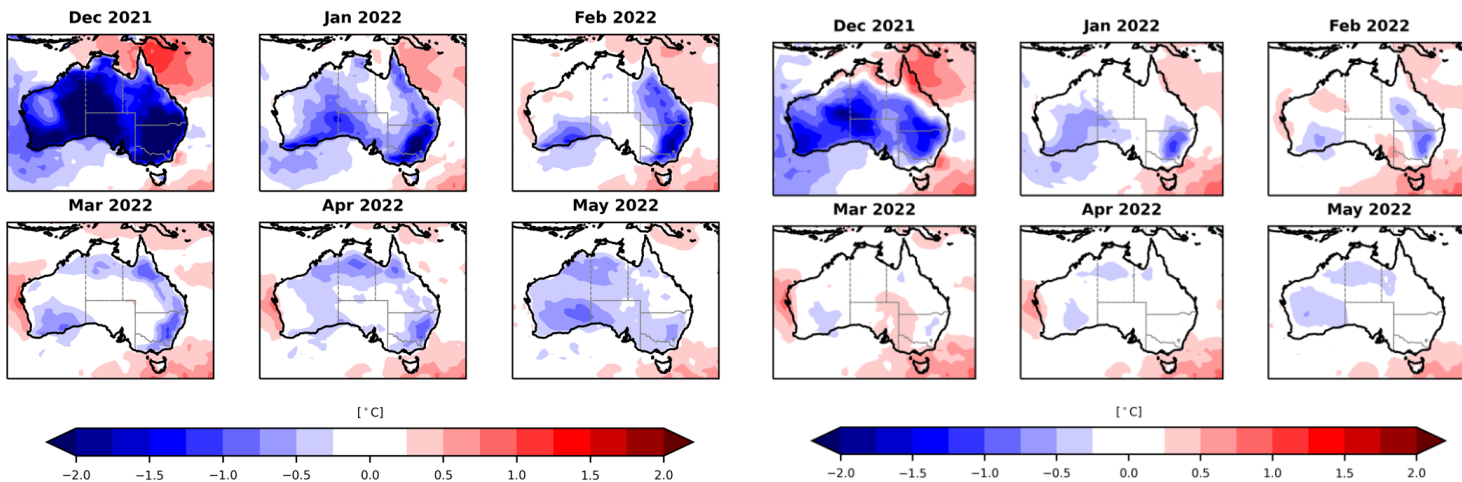
National Outlook - monthly

Maximums

Minimums

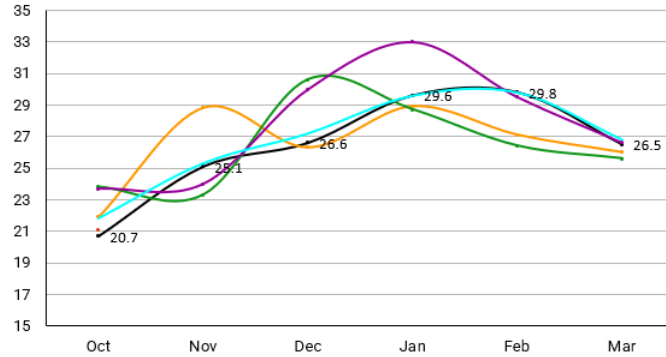
Tmax Anomalies

Tmin Anomalies



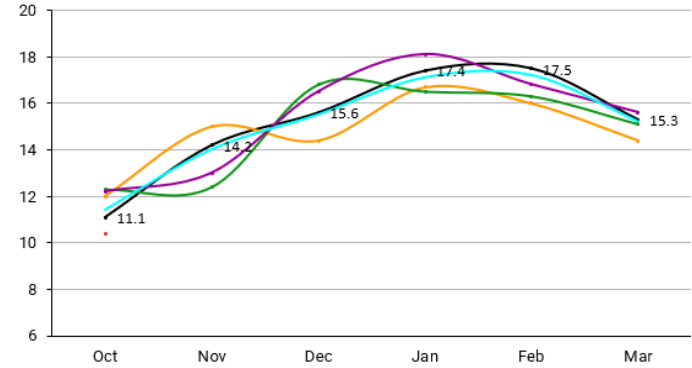
Adelaide

Maximums

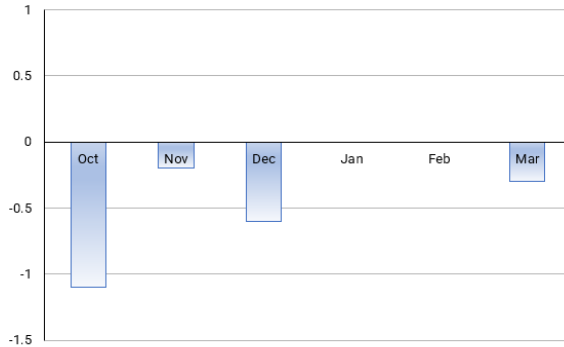


— Forecast — Obs — 2020/21 — 2019/20 — 2018/19 — Mean

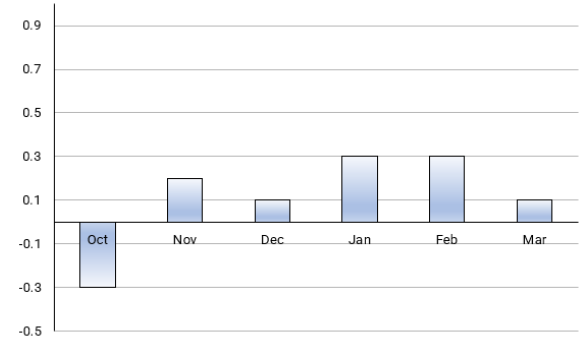
Minimums



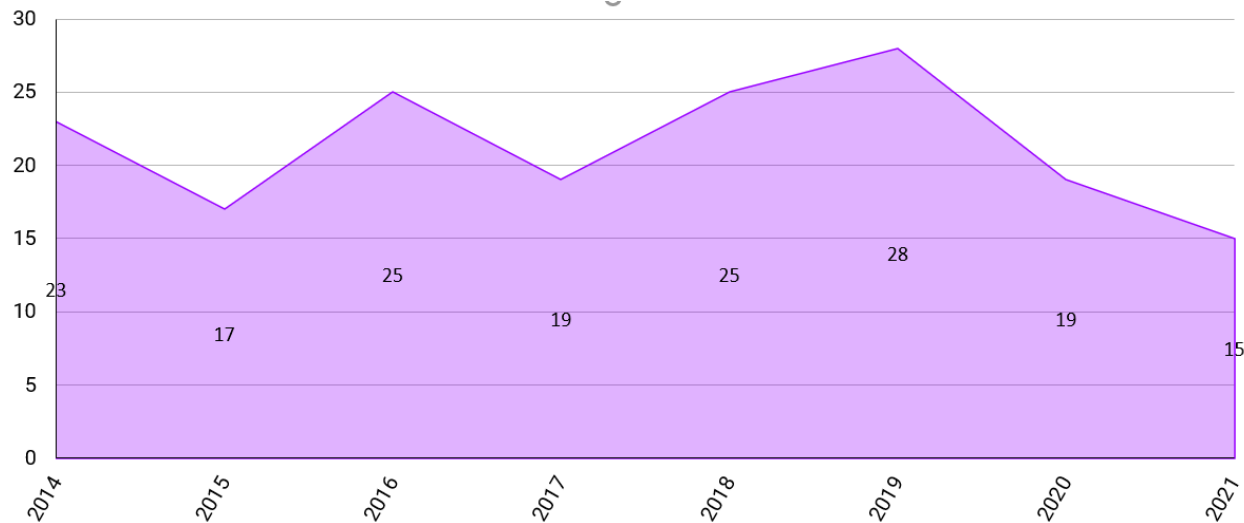
— Forecast — Obs — 2020/21 — 2019/20 — 2018/19 — Mean



Forecast Anomaly (1981-2010 mean)



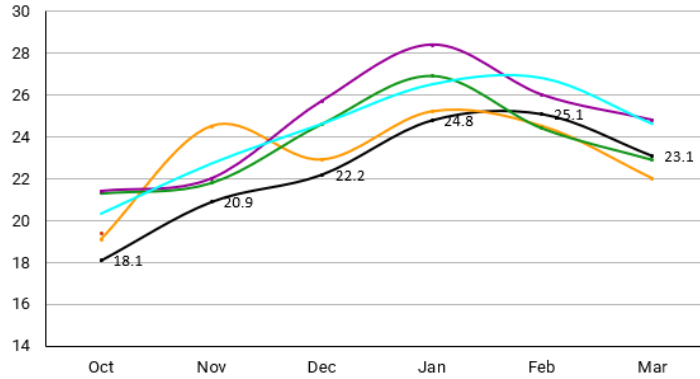
Adelaide - Days above 35 Deg (DJF)



Southern coastal locations such as Adelaide and Melbourne experience **fewer individual daily heat extremes during La Niña years** but an **increased frequency of prolonged warm spells**. Of the 32 Victorian heatwaves between 1989 and 2009, 17 occurred during La Niña years while only 6 occurred during El Niño 3.

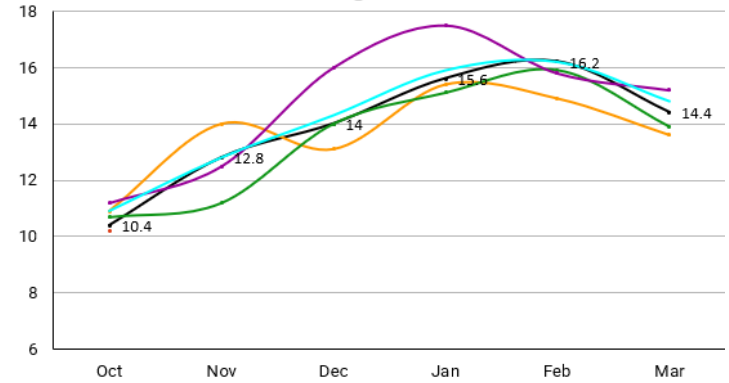
Melbourne

Maximums



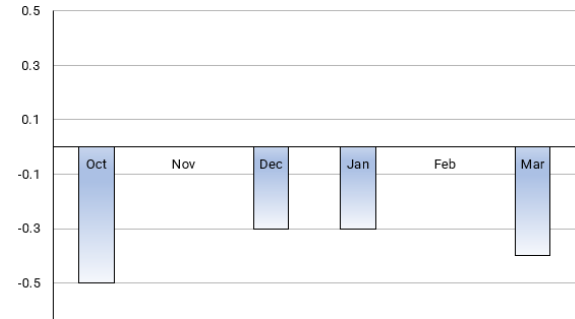
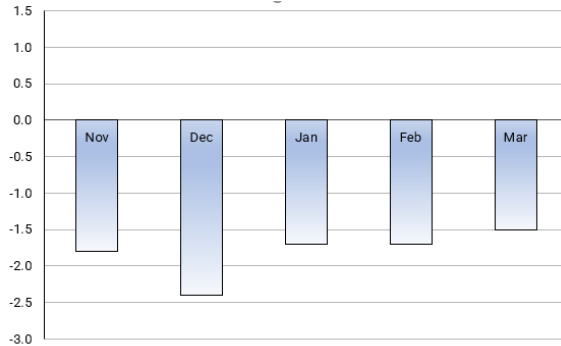
— Forecast — Obs — 2020/21 — 2019/20 — 2018/19 — Mean

Minimums

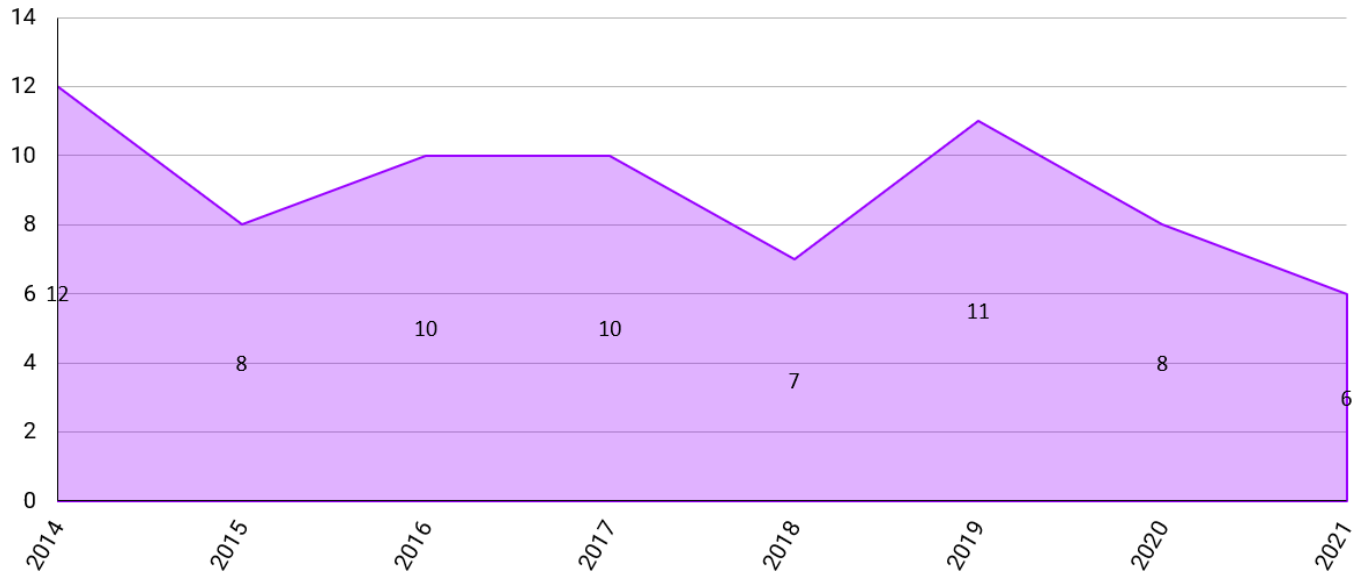


— Forecast — Obs — 2020/21 — 2019/20 — 2018/19 — Mean

Forecast Anomaly (1981-2010 mean)



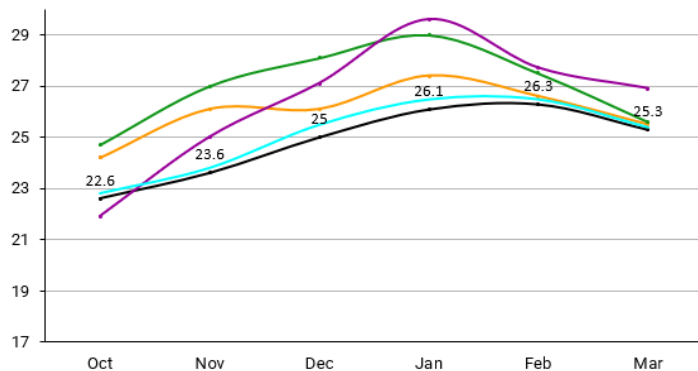
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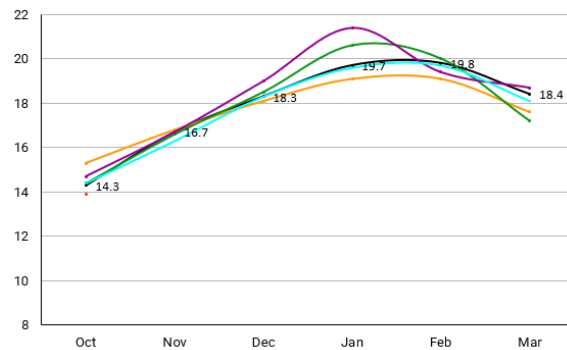
Sydney

Maximums



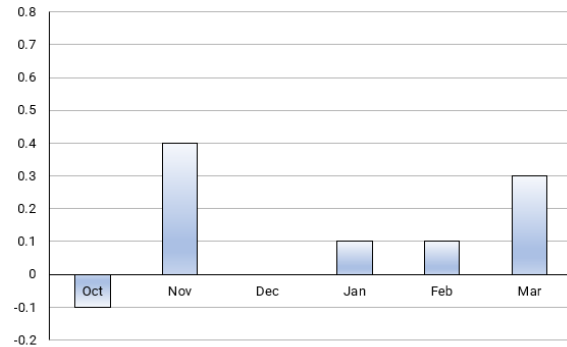
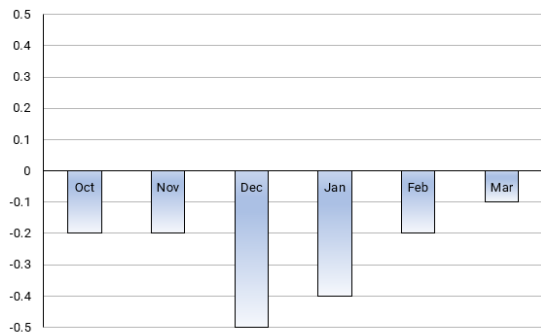
— Forecast — Obs — 2020/21 — 2019/20 — 2018/19 — Mean

Minimums



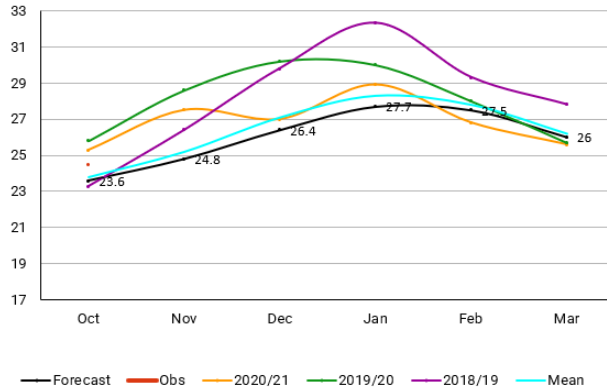
— Forecast — Obs — 2020/21 — 2019/20 — 2018/19 — Mean

Forecast Anomaly (1981-2010 mean)

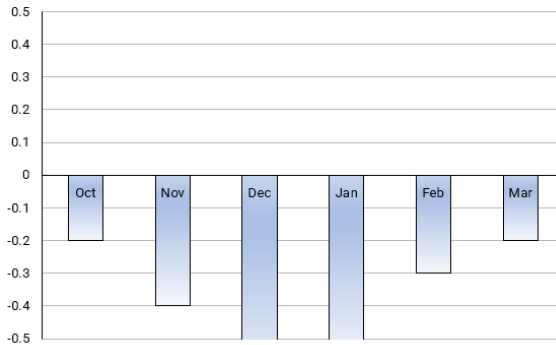
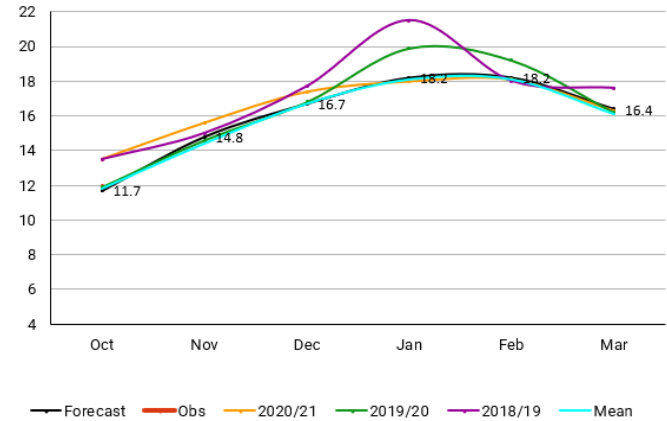


Bankstown

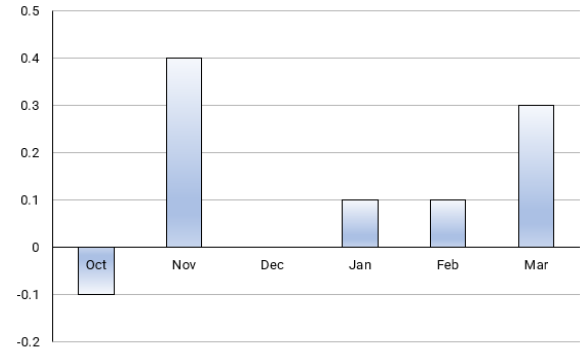
Maximums



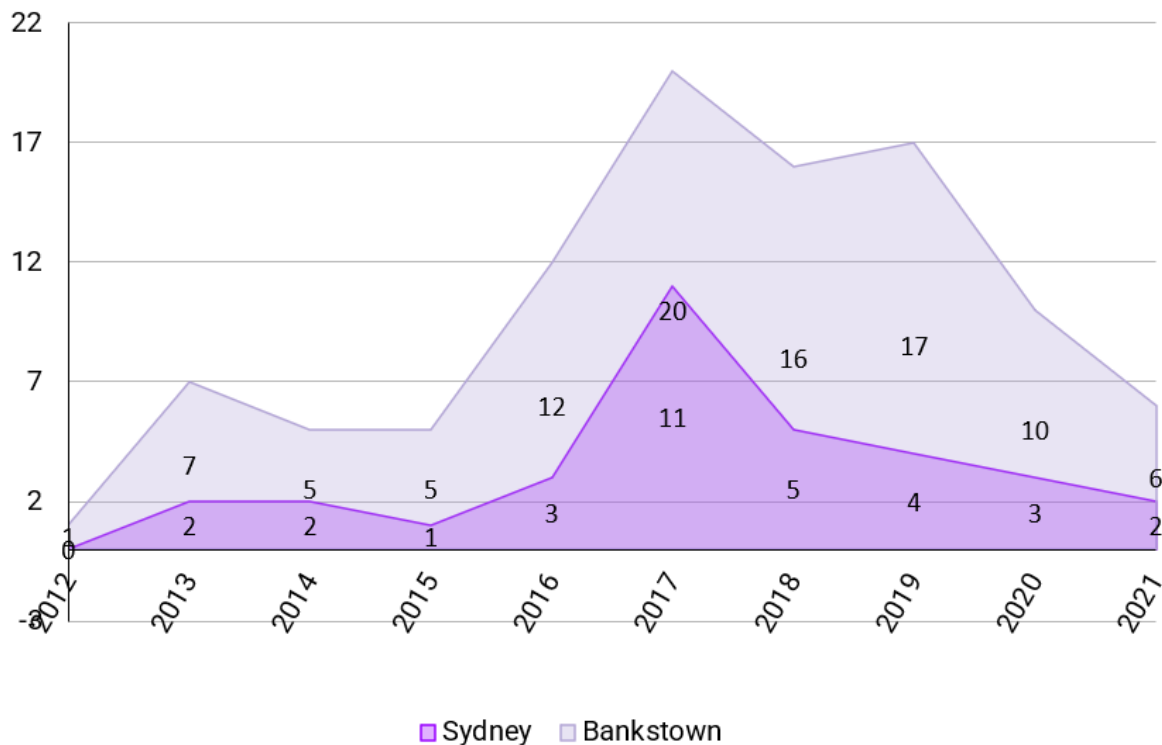
Minimums



Forecast Anomaly (1981-2010 mean)

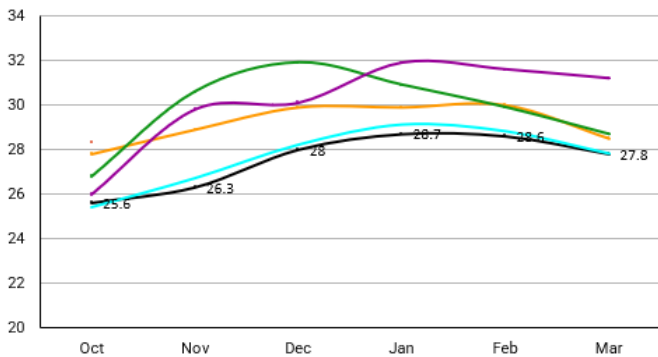


Sydney Basin - Days above 35 Deg (DJF)



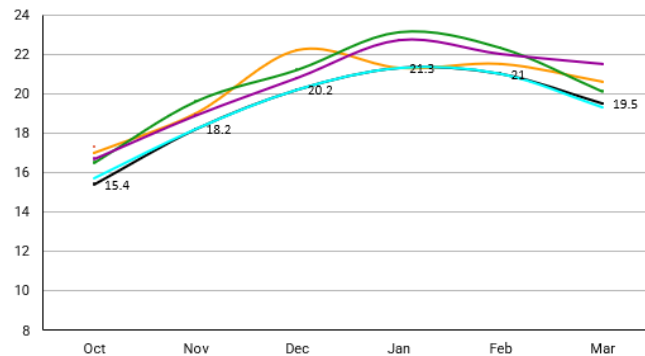
Brisbane

Maximums

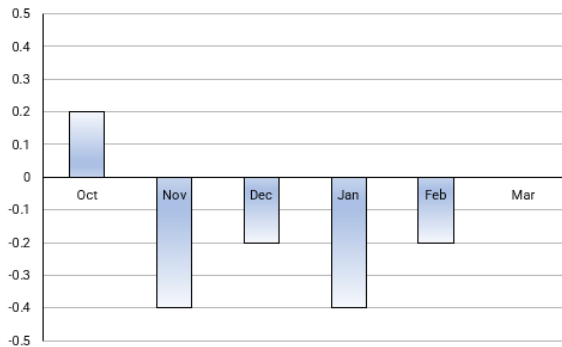


— Forecast — Obs — 2020/21 — 2019/2020 — 2018/2019 — Mean

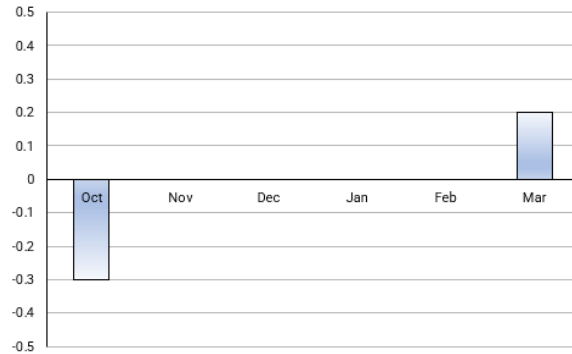
Minimums



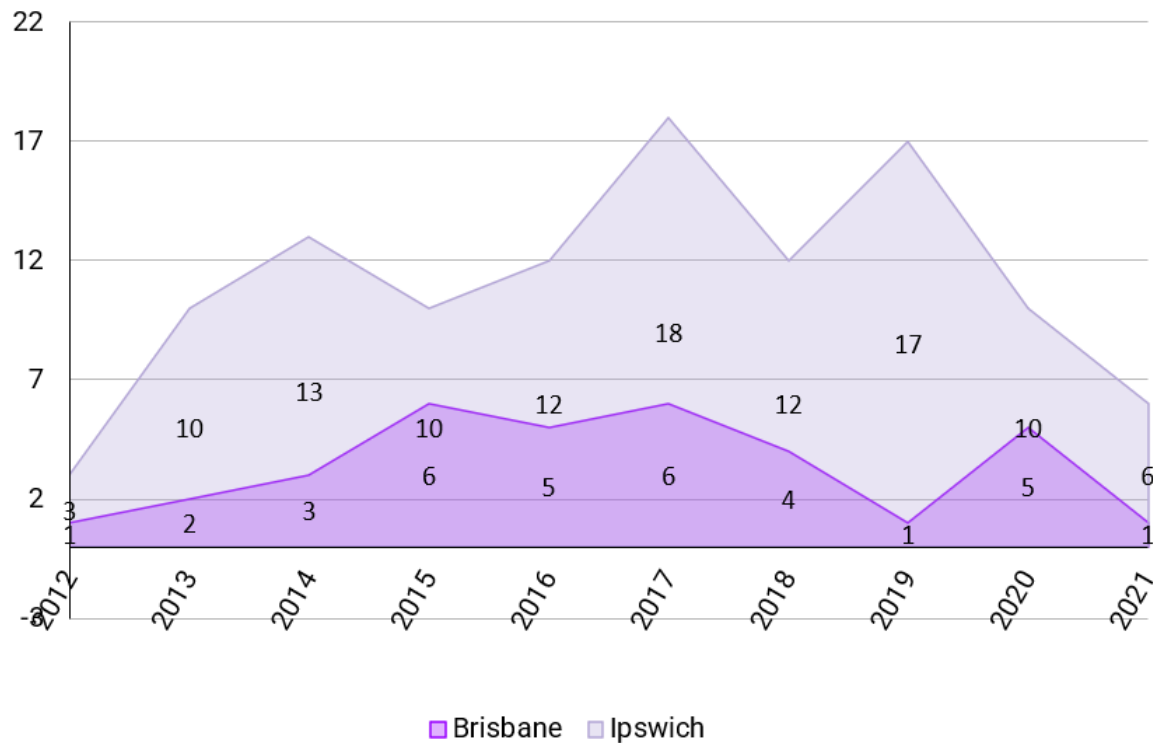
— Forecast — Obs — 2020/21 — 2019/2020 — 2018/2019 — Mean



Forecast Anomaly (1981-2010 mean)

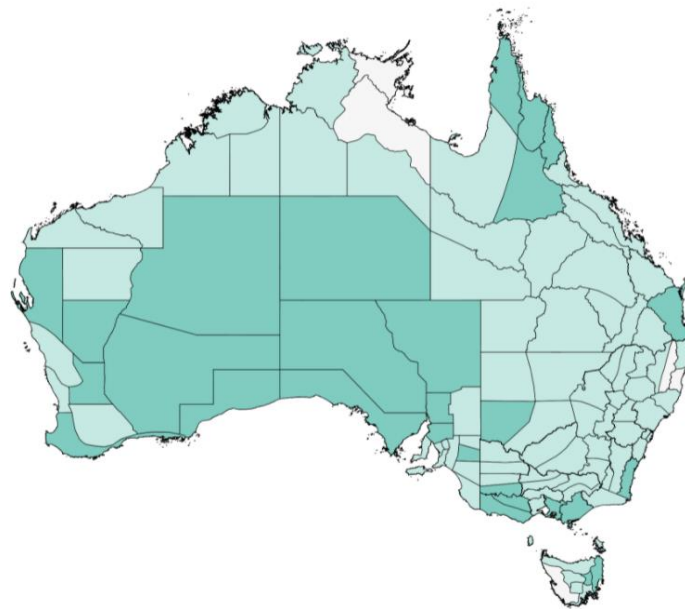


Brisbane - Days above 35 Deg (DJF)

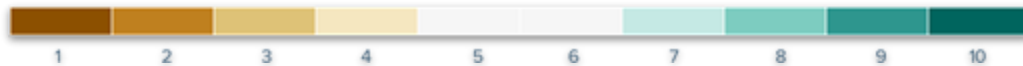


National Outlook - DJF

Rainfall

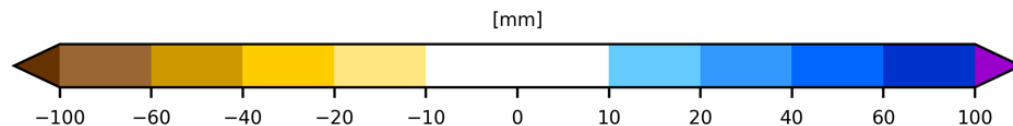
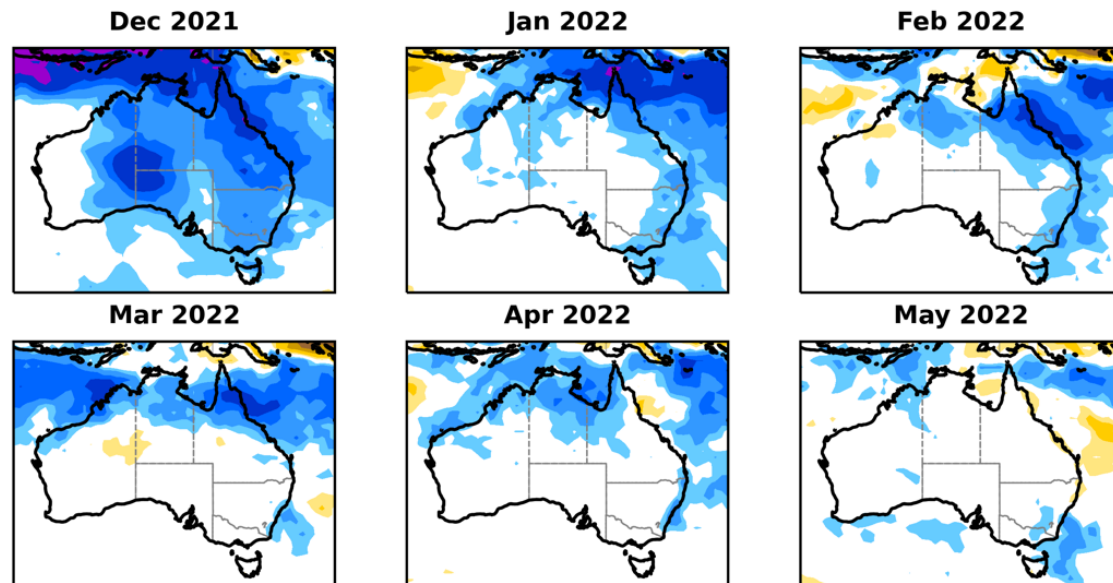


DECILES

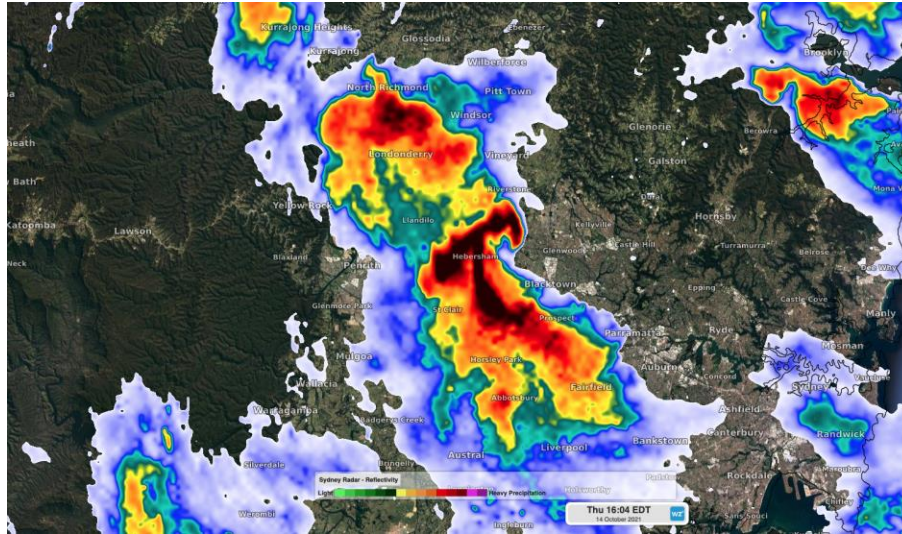


National Outlook - monthly

Rainfall Anomalies

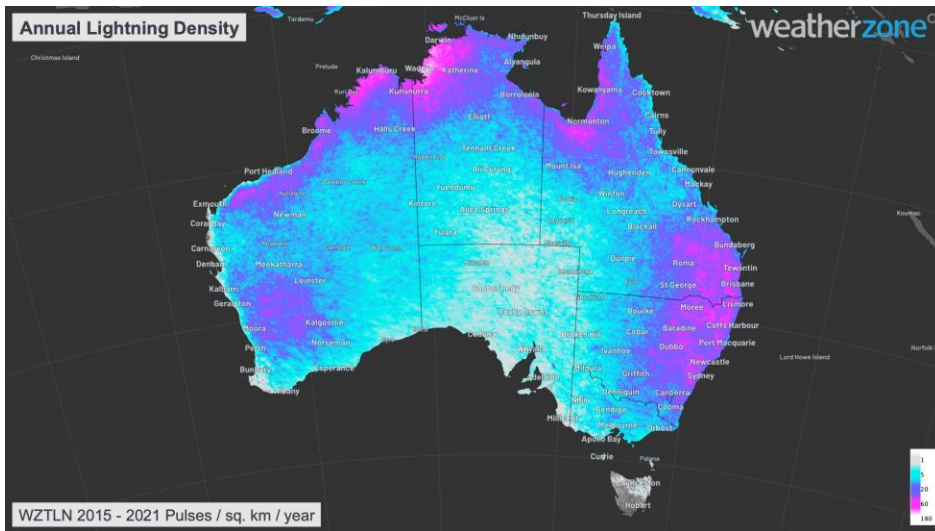


Thunderstorms



- Thunderstorms rely on a combination of; moisture, instability and a trigger.
- Moisture will be abundant this spring and summer

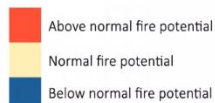
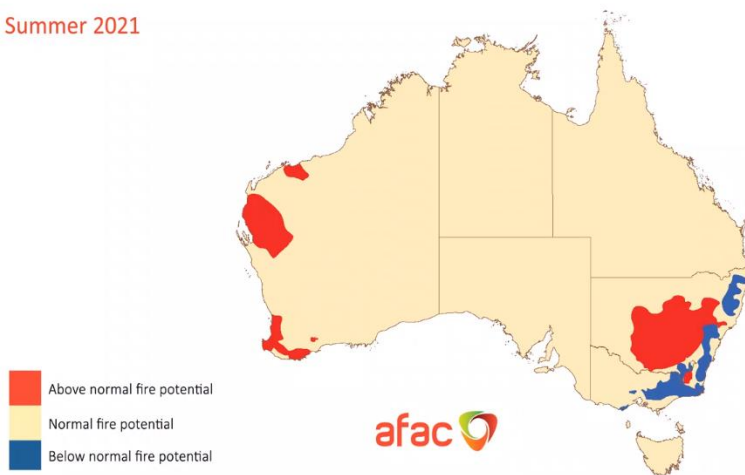
Thunderstorms



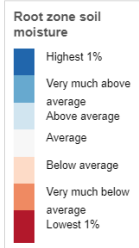
- + SAM and La Niña reduce the instability and triggers in southern and eastern Australia.
- Near-to-below normal thunderstorm activity in southern and eastern AUS until Jan.
- Normal to above normal for remainder of AUS.

Bushfire Risk

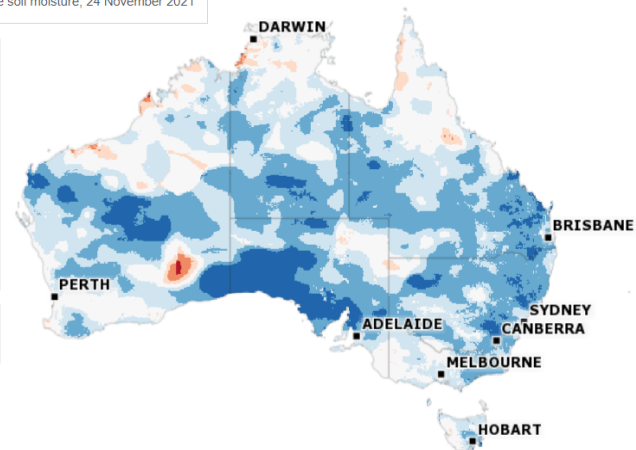
Summer 2021



Displaying: Root zone soil moisture, 24 November 2021



Values
 Actual Relative



- Above average soil moisture
- Reduced risk of extreme temperatures, increased heat wave risk.
- Below normal fire activity this season.
- While crop and grass fire a risk in NSW.

Climate Summary



Less extreme heat / more heatwaves



Above average rain and cloud



Near average thunderstorm activity



Below average bushfire activity




Above average northern wet season rain



Near to above average tropical cyclones



Reduced risk for strong wind events



weatherzone°

Questions?

weatherzone°

Ashleigh Lange

Level 5, 8 West Street
North Sydney NSW 2065

E: alange@weatherzone.com.au
P:0417 733 170

AEMO 2021-22 Summer Readiness

26 November 2021



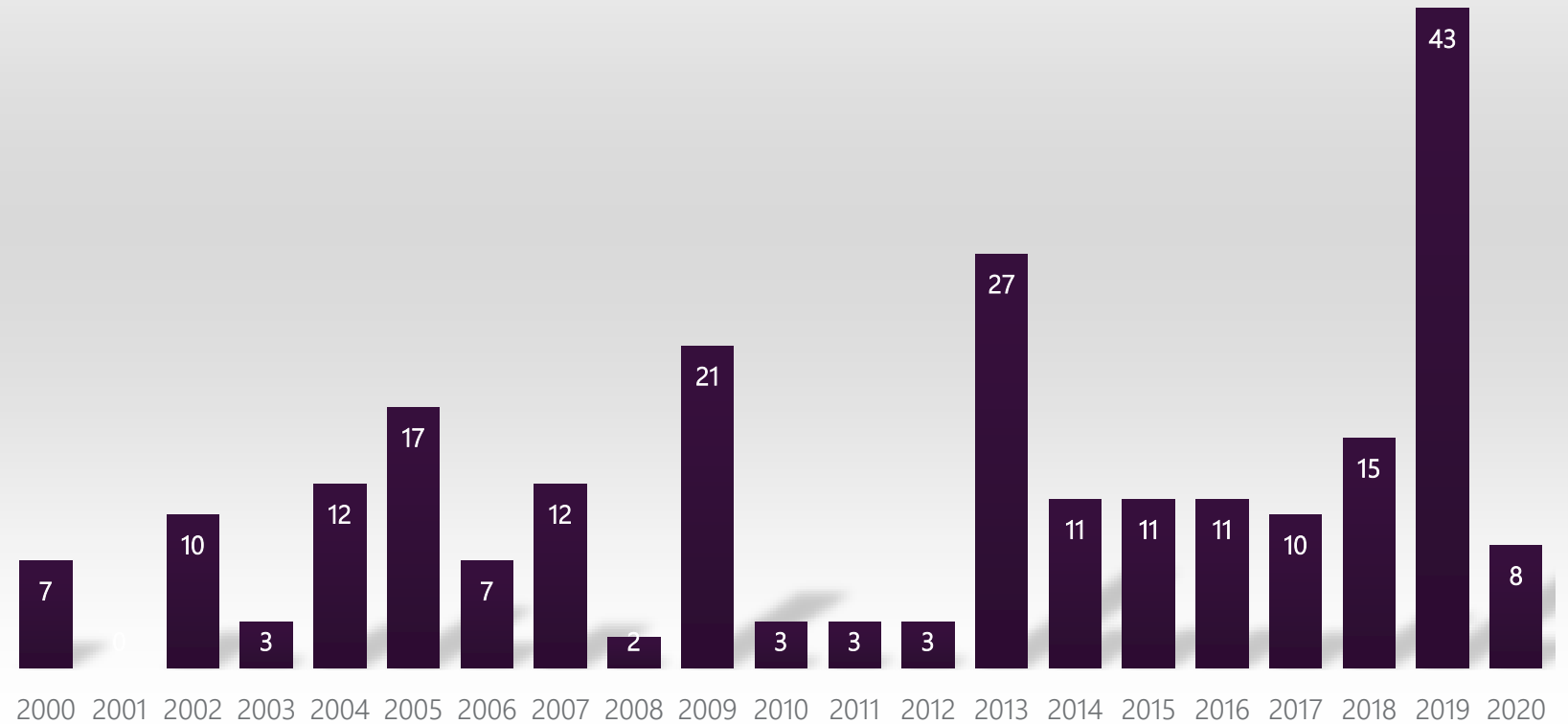
1. 2020-21 Summer Recap
2. Weather Outlook
3. Supply Demand Outlook
4. RERT
5. Minimum demand
6. 2021-22 Summer Plan
7. Comms and Stakeholder Engagement
8. Risks and Issues



2020-21 Summer Recap

- Average daytime temperatures.
- Warmer nights in QLD and NSW coasts.
- Wettest summer since 2016-2017.
- Reduced number of extreme hot days compared to the 2019-2020 summer.



















Number of days each year where the Australian daily area-average mean temperature is extreme
(warmest 1% of mean temperature days)



Weather Outlook

- Declared La Niña event
 - Longer duration but less intense heatwaves
- Minimum temperatures expected to exceed average
- Maximum temperatures to exceed average in central QLD, SA, VIC and TAS
- Above average rainfall for most regions except west TAS

Severe Weather Outlook: September 2021 – April 2022 Summary

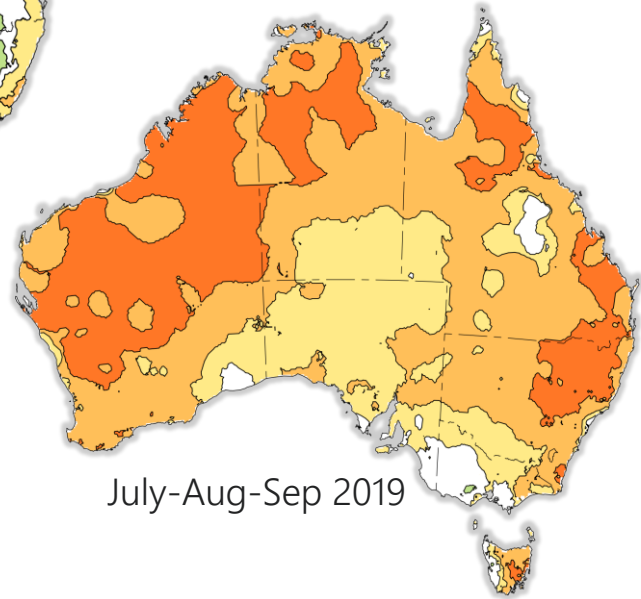
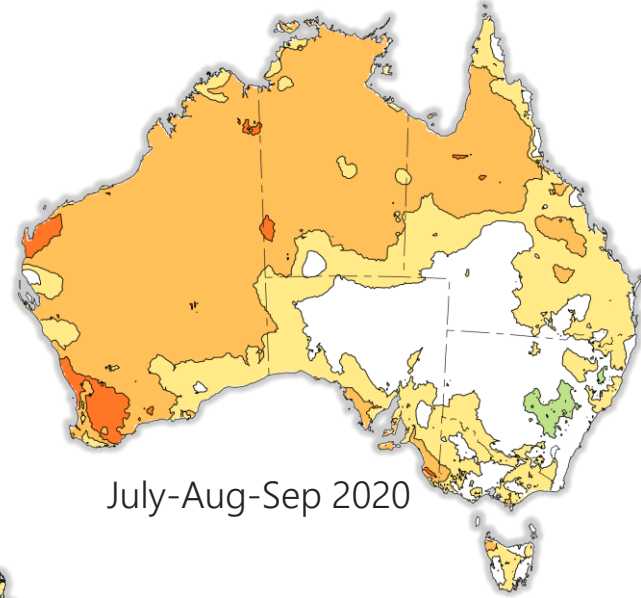
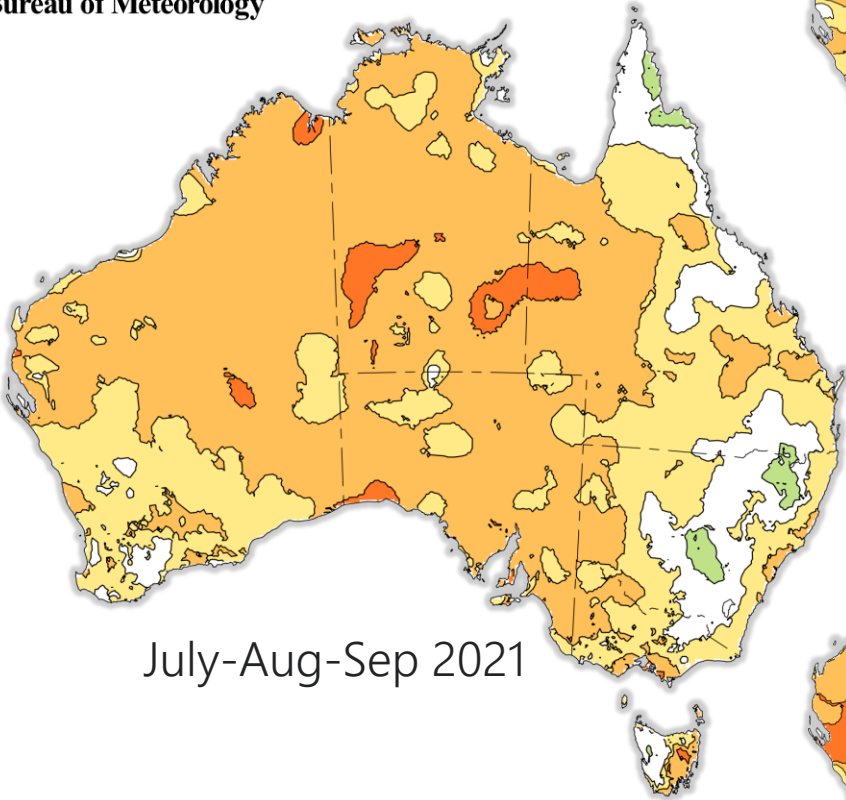
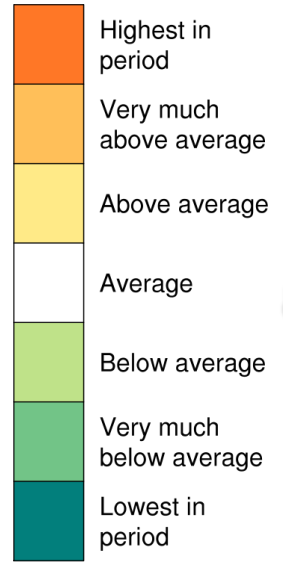
Impact	Likelihood compared to recent decades
 Widespread flooding	 More likely
 Coastal flooding / erosion	 More likely
 Severe storms	 Similar
 Bushfire risk	  Similar, increased for parts of Qld/NSW
 Heatwave	  Similar spring, increased summer
 Tropical cyclones	 More likely
 Drought	 Less likely
 Dust	 Less likely

Forest Fire Danger Index - Previous July to September periods

Forest Fire Danger Index (FFDI) Deciles



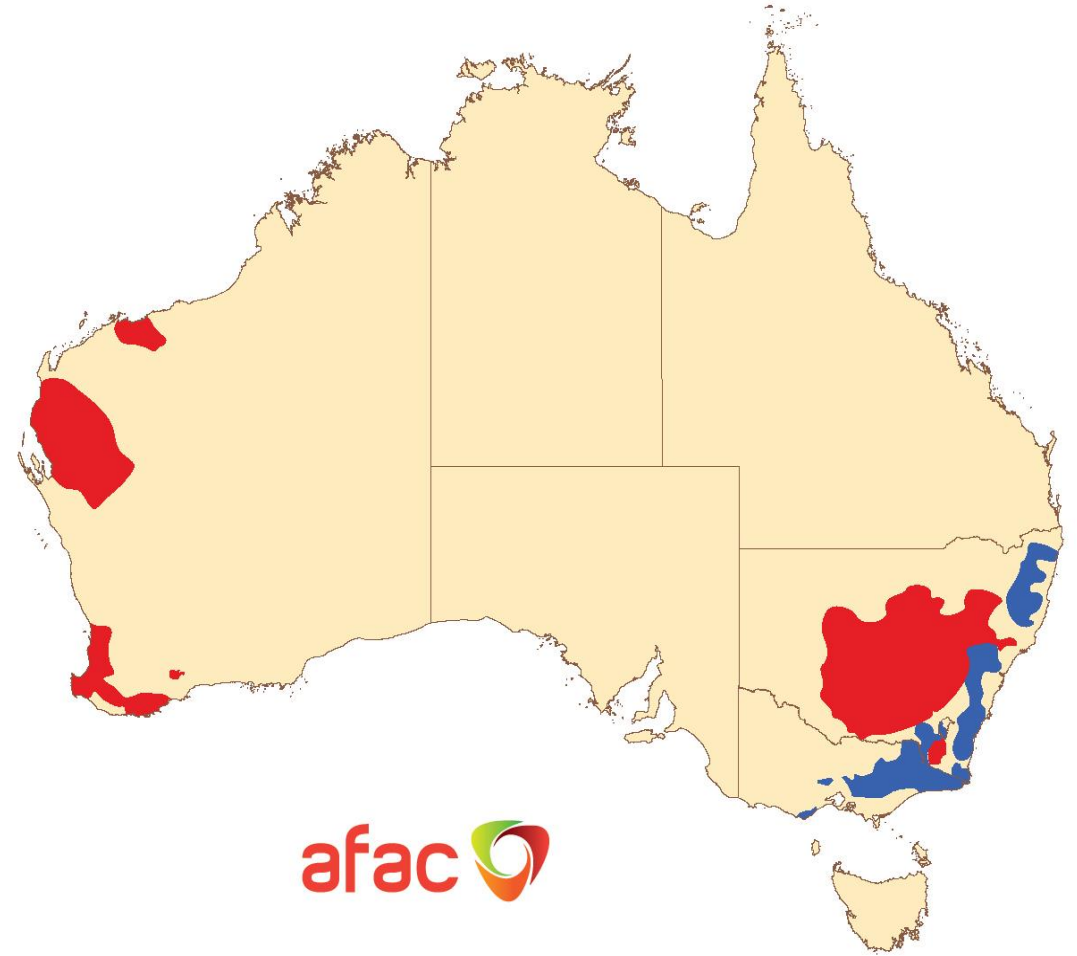
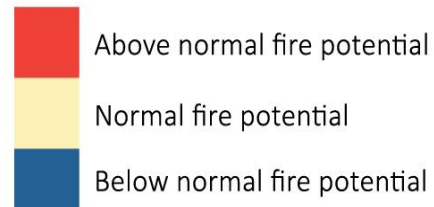
Australian Government
Bureau of Meteorology



Summer Bushfire Outlook

- Above normal fire potential in large parts of NSW
- Below normal in ACT, eastern NSW and VIC

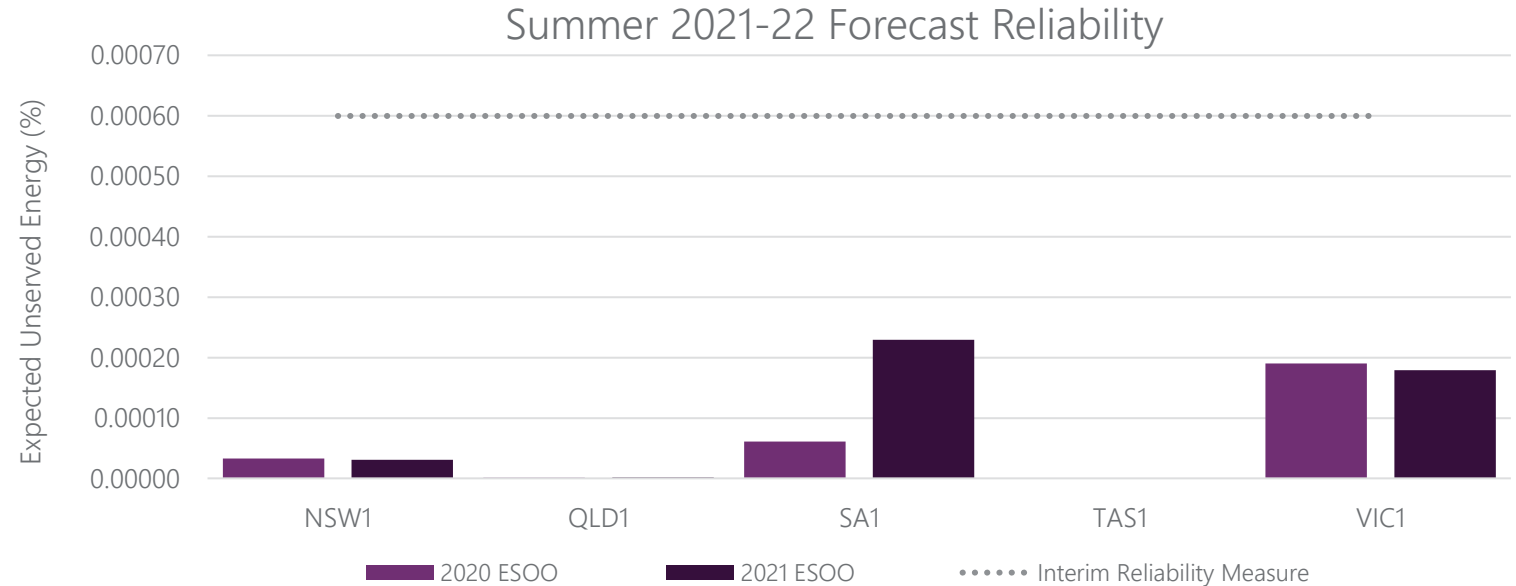
Summer 2021



Supply Demand Outlook

2021 ESOO

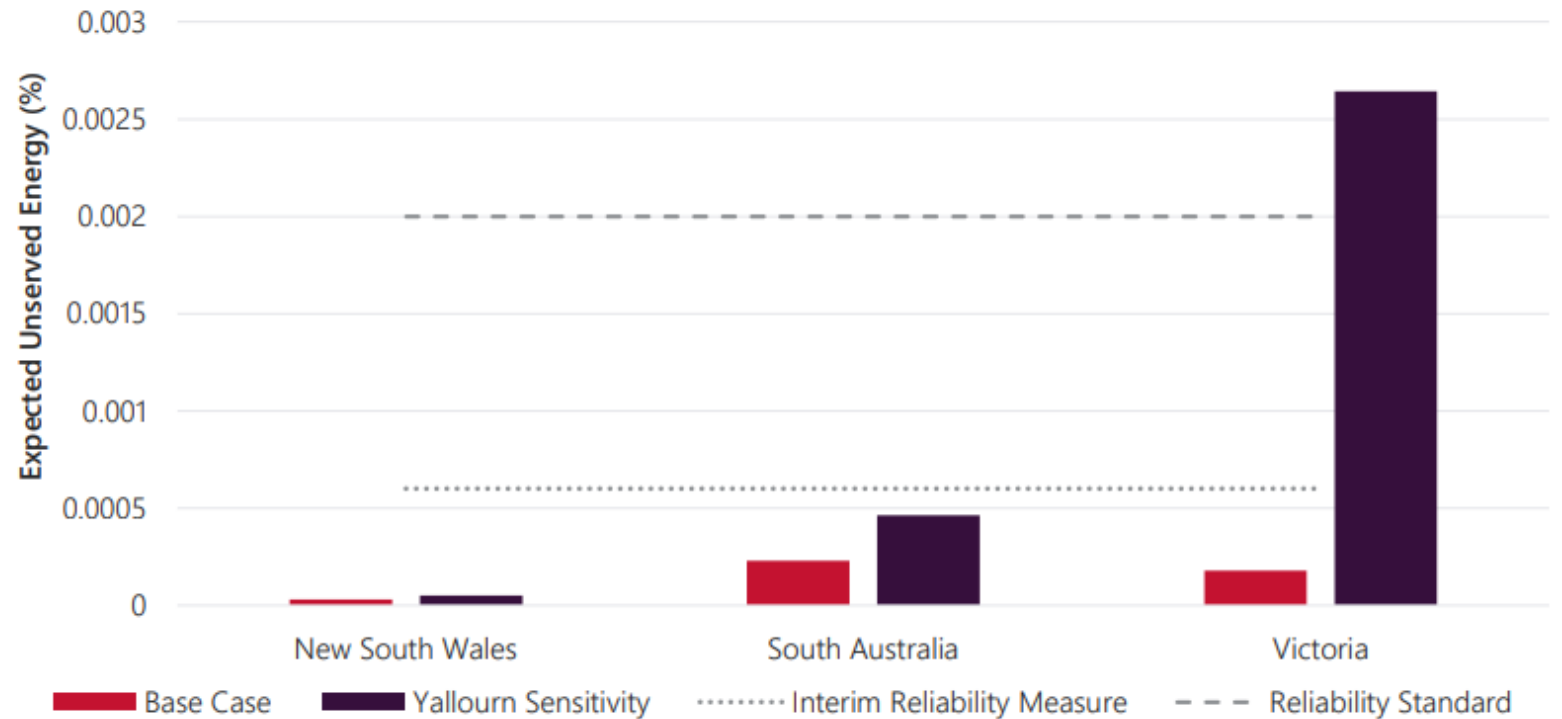
- Forecast unserved energy below both the reliability standard (0.002%) and the Interim Reliability Measure (0.0006%) for all regions this summer.
- Risk of load shedding remains where high demand coincides with generator forced outages and/or very low VRE.



- Peak demand and energy consumption is forecast to reduce for New South Wales and Queensland, driven by lower growth from business mass market, and in some regions, less industrial load growth.
- An additional 2,048 MW of new capacity expected to be available.
- Callide C Unit 4 in Queensland remains on extended outage after the operating incident in May 2021.
- Torrens Island B1 in South Australia is now unavailable for the coming summer following the announced mothballing.

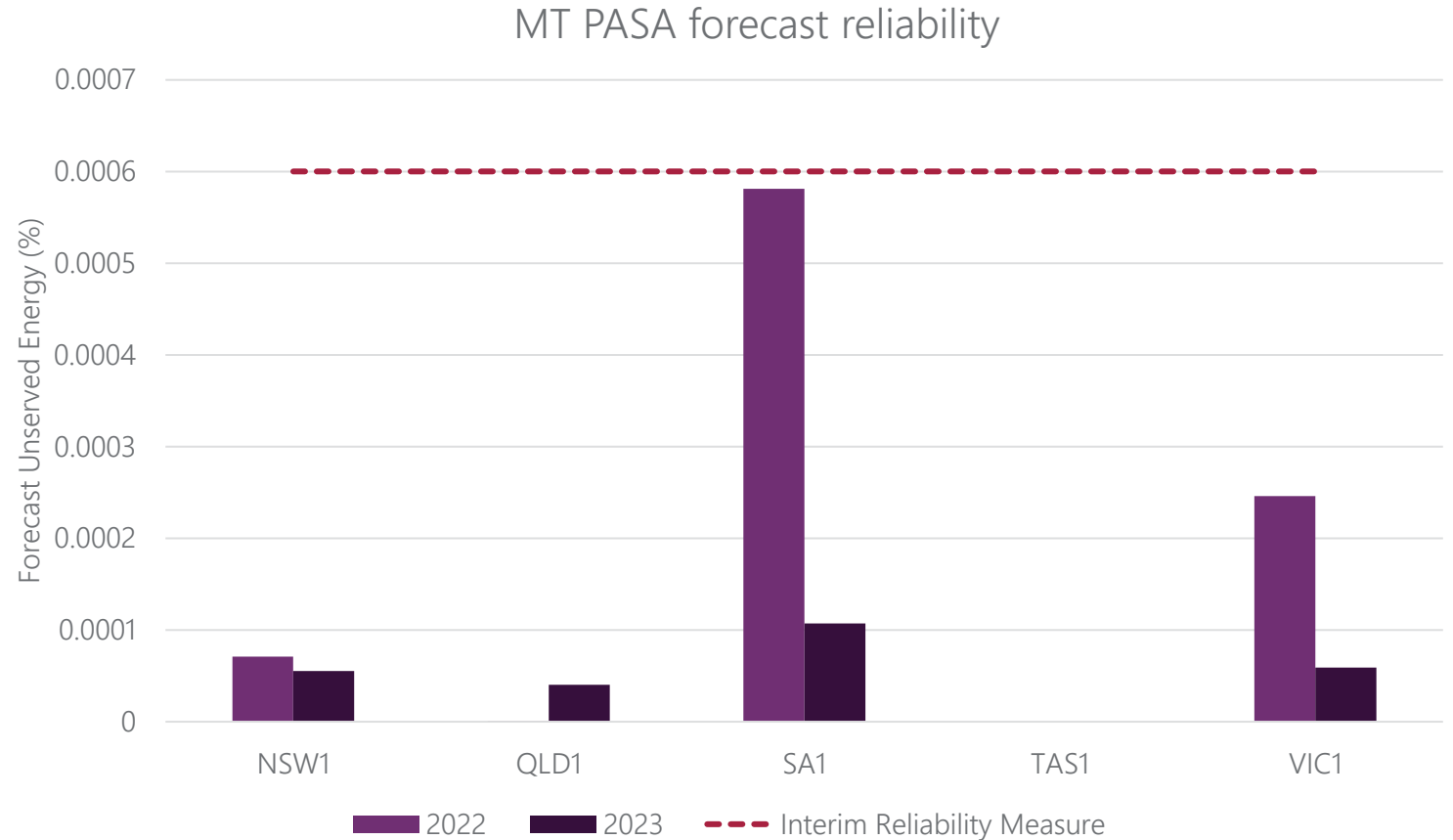
2021 ESOO Yallourn PS sensitivity study

- Flooding of the Morwell River in June 2021 damaged Yallourn PS mine wall, forcing generation offline
- Heavy rainfall may result in further damage



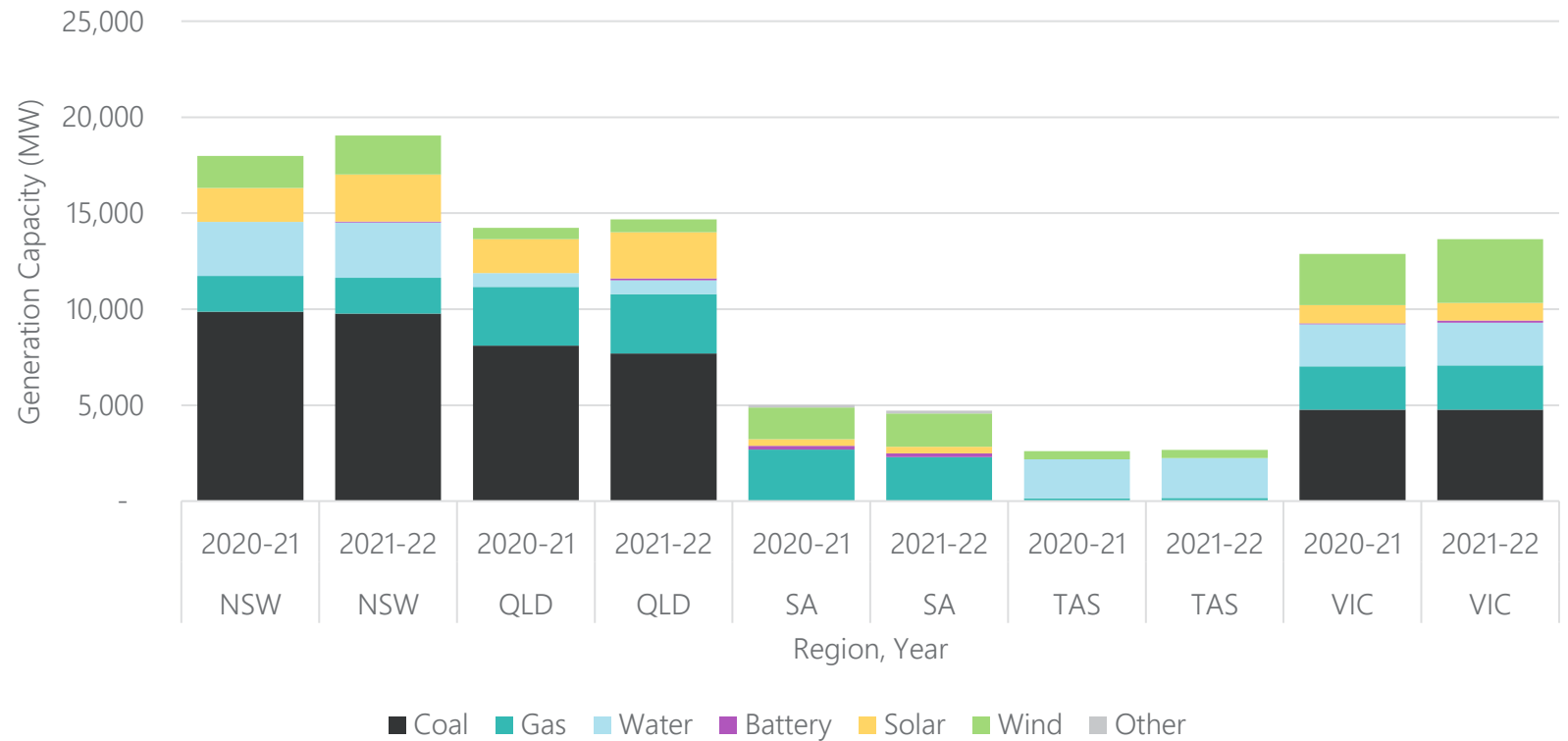
Supply Demand Outlook

- MT PASA calculations since the 2021 ESOO show forecast USE in SA is close to the IRM
- Includes the most up to date information including the unavailability of Mintaro PS



Supply Demand Outlook

- Additional 2,048 MW available capacity in the NEM compared to previous summer



Reliability Emergency Reserve Trader (RERT)

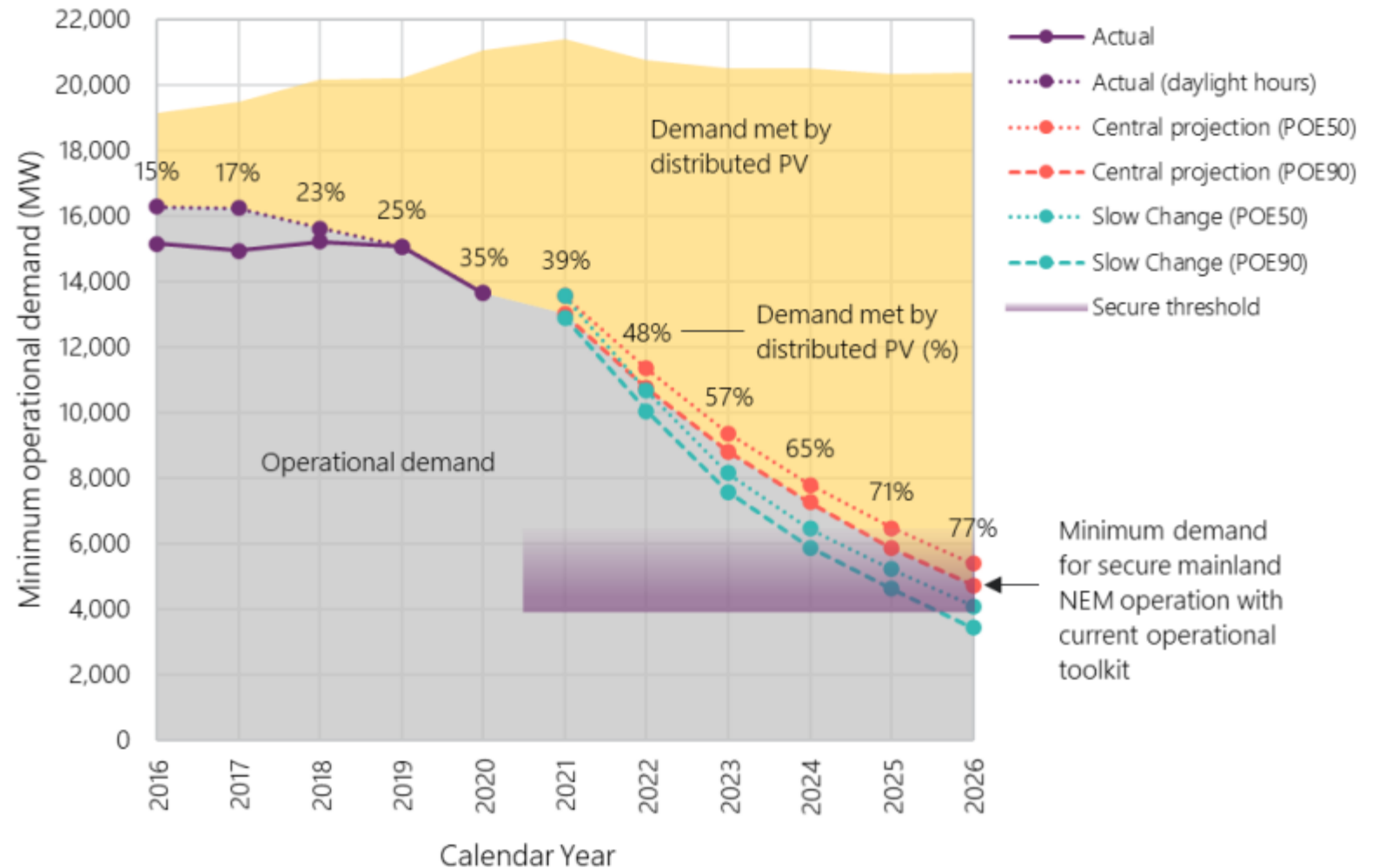
- AEMO will maintain a panel of suppliers that can provide emergency reserves at short notice

- AEMO's 2021-22 summer outlook forecasts unserved energy to remain below the reliability standard for all regions.
 - The latest MT PASA forecast SA USE close to 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. Estimated reserve volumes for 2021-22 summer are:
 - Queensland – 400 MW
 - New South Wales – 800 MW
 - Victoria – 750 MW
 - South Australia – 80 MW

Minimum Demand

- Minimum demand in the NEM is expected to reduce rapidly in the next 5 years due to increased distributed PV
- Reducing demand may force synchronous generation out of dispatch
- Christmas/New Year period historically has low minimum demand

- Minimum operational demand threshold in the NEM to maintain system security is 6 GW (forecast to reach by 2025).
- Minimum System Load (MSL) framework to increase load if security issues arise



2021-22 Summer Plan

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

Comms and Stakeholder Engagement

Proven channels used to communicate with stakeholders

Pre Summer

- Targeted Parts of Industry
 - Major Generators
 - TNSP, MNSP
- Jurisdictional Engagement
 - Briefings
 - Exercises
- Whole of Industry
 - Summer Readiness Industry Briefing
 - Summer Readiness Plan
- Other
 - As requested

During Summer

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

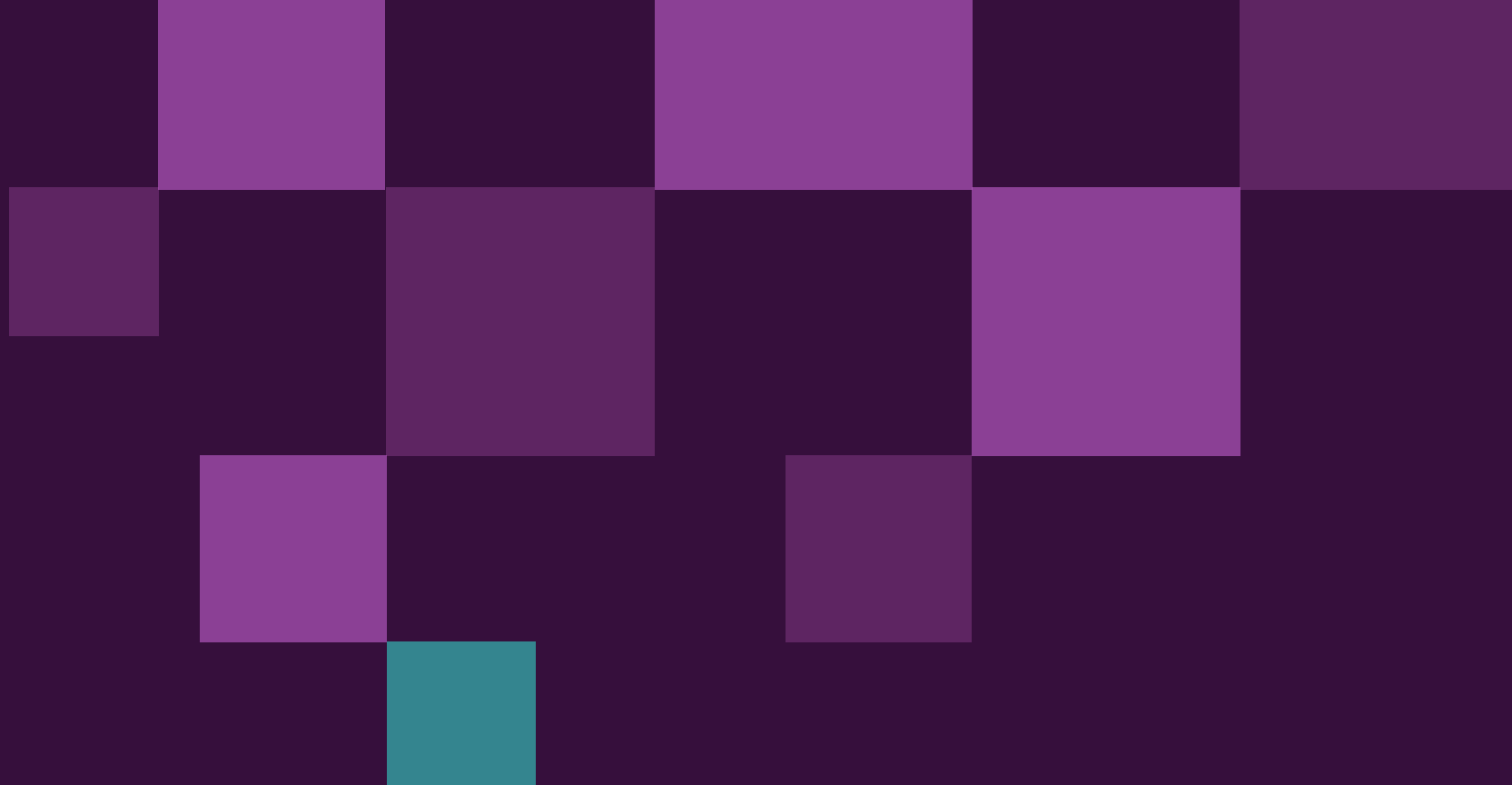
Risks and Issues

Risks	Mitigation
Network and generation forced outages exceeding limits historically observed	RERT Panel
COVID-19 restrictions impacting planned generation and network outages, generator commissioning	<ul style="list-style-type: none">• AEMO working with Generators, TNSPs, jurisdictions• Relaxed summer transmission outage guideline to manage outages better across all seasons
Increased storm and flooding impacting fuel supply	Monitor coal generation availability
Bushfires impacting fuel supplies (coal or gas production), generation or network assets.	Monitor risks with asset owners Contingency plans
Unplanned network events during low demand periods	Contingency plans in place

Risks and Issues

Region specific issues

Issues	Impacted Region(s)	Impact
Limit on SA to VIC transfer due to Para SVC outage	VIC/SA	Constraint on Heywood interconnector
Scheduled generation unavailability (Mintaro PS in SA, Callide C4 in QLD)	SA, QLD	Increased risk of USE and reduction in system strength
Proposed Snapper Point PS connection	SA	AEMO is working with ElectraNet towards becoming operational. Otherwise reduced available capacity during summer.
Yallourn flooding risk	VIC	Risk of USE if impact to power station operation



For more information
please visit www.aemo.com.au



NEM Summer Readiness and Semi-scheduled generator compliance

26 November 2021

Pip Eastgate
Assistant Director – Compliance and Enforcement Branch

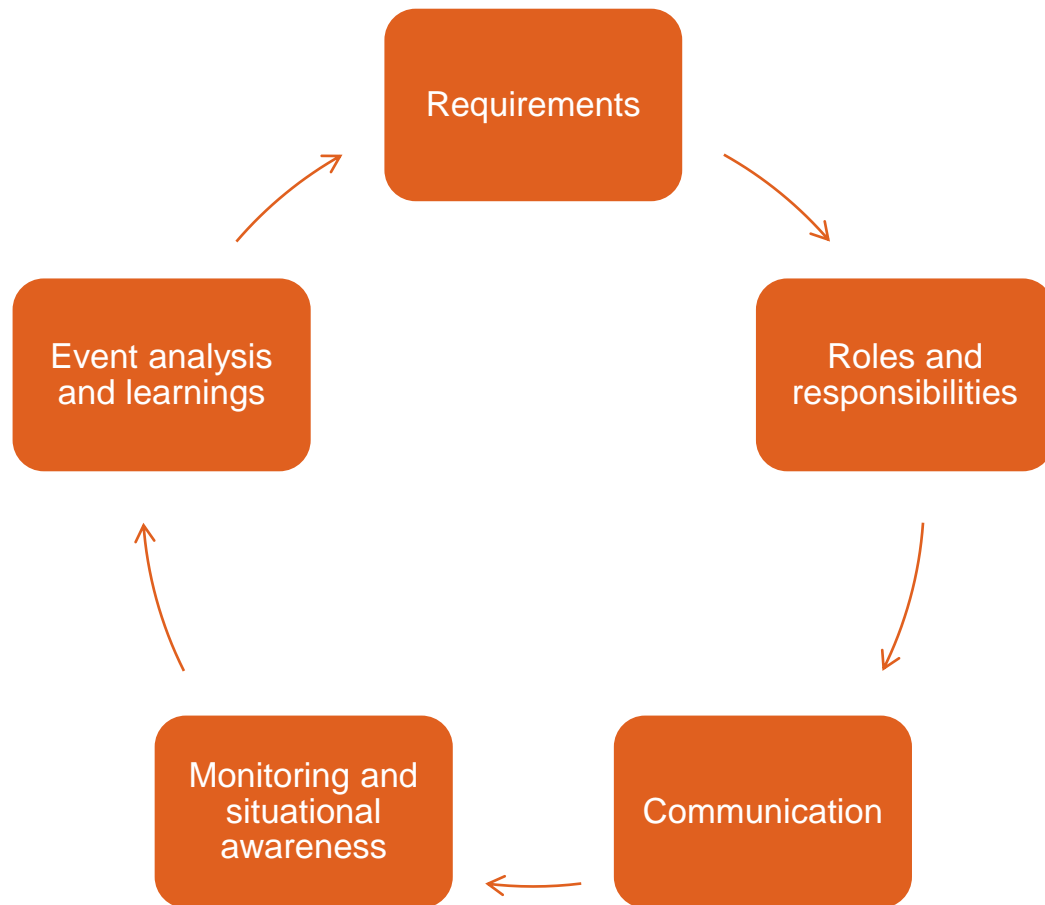
Introduction

- AER's role
- Conditions predicted for summer 2021-22
 - AEMO's 2021 *Electricity Statement of Opportunities* notes that the expected unserved energy is forecast to remain below the reliability standard in all NEM regions
 - MT PASA forecast for SA shows a marginal breach of the Interim Reliability Measure

Identifying and managing risks

- What is a risk to power system security is constantly changing
- Maintain situational awareness to proactively identify risks
 - Monitor plant performance
 - Observe environmental conditions - temperature, wind speed
 - Consider AEMO Market Notices
- Communicate risks promptly
 - Within the business
 - To AEMO

Robust systems and processes



Information provision to AEMO

- It is critical that AEMO has timely, accurate and complete information to perform its functions
- Participants have a range of obligations under Chapters 3 and 4
 - Time horizons – 3 years out, day ahead, pre-dispatch to real time
 - Information requirements – availability, offer requirements, plant status

NER clause 4.8.1 – Registered Participants' advice

A Registered Participant must promptly advise AEMO or a relevant System Operator at the time that the Registered Participant becomes aware, of any circumstance which could be expected to adversely affect the secure operation of the power system or any equipment owned or under the control of the Registered Participant or a Network Service Provider.

Maintaining contact with AEMO

- AEMO must be able to contact plant operators at all times
 - Participants must ensure AEMO has current contact details for plant operators
 - Contacts must be reachable 24 hours a day
- Recent issues with off-site control rooms
 - Remote control rooms unable to action AEMO instructions
 - Poor telephone line connections
 - Language barriers
- Nominated contact must be able to act on AEMO's instructions
 - Participants must ensure the contact is familiar with the relevant plant

Acting on AEMO instructions

NEL section 116

(1) AEMO may, if it considers that it is necessary— (a) to maintain power system security; or (b) for reasons of public safety, direct a Registered participant, or authorise a person to direct a Registered participant, or subject to subsection (2), authorise a person, to take one or more **relevant actions** in accordance with the Rules.

- Relevant action means:
 - to switch off, or re-route, a generator
 - to call equipment into service
 - to take equipment out of service
 - to commence operation or maintain, increase or reduce active or reactive power output
 - to shut down or vary operation
 - to, in accordance with the Rules and any procedures made in accordance with the Rules in relation to load shedding, shed or restore load
 - to do **any other act or thing** necessary to be done to maintain power system security or for reasons of public safety

Other critical NER obligations

- Plant must be capable of complying with offer
 - Use of automated bidding software
- Following dispatch instructions
 - New rule for semi-scheduled generators
- Honouring latest offer (clause 3.8.22A)
- Submission of availability data
- Notifying AEMO of plant changes, defects or failures

AER Summer Readiness publications

- The AER's Summer Readiness compliance bulletin outlines our expectations in relation to key obligations
 - Supporting checklist to assist participants to achieve compliance
 - Available on AER website
 - Minor amendments will be released next month

AER semi-scheduled generator compliance bulletin

- To be released early 2022
- Will provide guidance to semi-scheduled generators on:
 - their role and responsibilities in the NEM
 - obligations relating to dispatch and rebidding
 - control room operations – communication with AEMO
 - examples of best practice approaches to compliance
- AER currently seeking input from semi-scheduled generators
 - systems and processes semi-scheduled generations have in place to ensure compliance with the NER
 - areas of the NER where guidance would be most useful
- To share your views, please contact Pip.Eastgate@aer.gov.au

Contacting the AER

- Over summer, the AER will continue to monitor the market closely and liaise with AEMO regarding market operation and risks
- For compliance queries, or to self-report a compliance issue, please email AERCompliance@aer.gov.au