Consumer Forum

19 June 2023

Margaret Lynch, Stakeholder Engagement Lead, Corporate Services

In the spirit of reconciliation, we acknowledge the traditional owners and custodians of this land, who have walked and cared for it for thousands of years, and their descendants who maintain their spiritual connection and traditions.

We thank them for sharing their cultures, spiritualities and ways of living with the land, in this place we all call home.

We pay respect to elders past, present and emerging.

May we walk gently and respectfully, together.

Meeanjin, home of the Turrbal and Jaggera peoples

Today's agenda

Time	Item	Speaker
10:00 am	Welcome and acknowledgement of country	Stakeholder Engagement Lead, Margaret Lynch
10.05 am	Winter readiness	Executive General Manager Operations, Michael Gatt
10.25 am	East Coast Gas reforms	Manager Gas Reform Implementation, Robbie Flood
10.40 am	Budget and fees	Manager Planning and Partnering, Strategic Finance, Yogesh Nagarajan
10.50 am	NEM Reform update	Manager Wholesale Reform Program Delivery, Chris Muffett
11.00 am	ISP update	Manager Sector Coupling, Dan Collins Manager Strategic Planning, Sam Christie
11.30 am	VNI West update and Q&A	Manager VNI West Procurement & Delivery, Sam Magee
11.55 am	Other business and next meeting	Stakeholder Engagement Lead, Margaret Lynch

Housekeeping

- This session is being recorded
- Muted unless talking, thank you
- Q&A function – groups relevant questions and comments
- Ask questions via the chat function throughout but will follow up with those we don’t address in session
- Respectful and relevant
- Equal opportunity to engage

Last time we met, you said …

- You wanted verbal submissions and feedback during forums to be considered formal feedback …
  - We agree. We specifically say we welcome verbal submissions some of the time but please know it's available all of the time. We are here to listen and will make that explicit. All feedback is taken into account.
- Submission surveys (written responses) often require formal approval ...
  - We will consider a templated Word version to enable this.
- Mixed views on AEMO's involvement in building social licence …
  - AEMO considers it crucial to understand community sentiment, issues/risks and possible opportunities and pathways, to inform the development of the ISP (which we are required to produce) and support Australia's ambition of net zero.

NEM winter readiness

Executive General Manager
Operations, Michael Gatt

Winter outlook

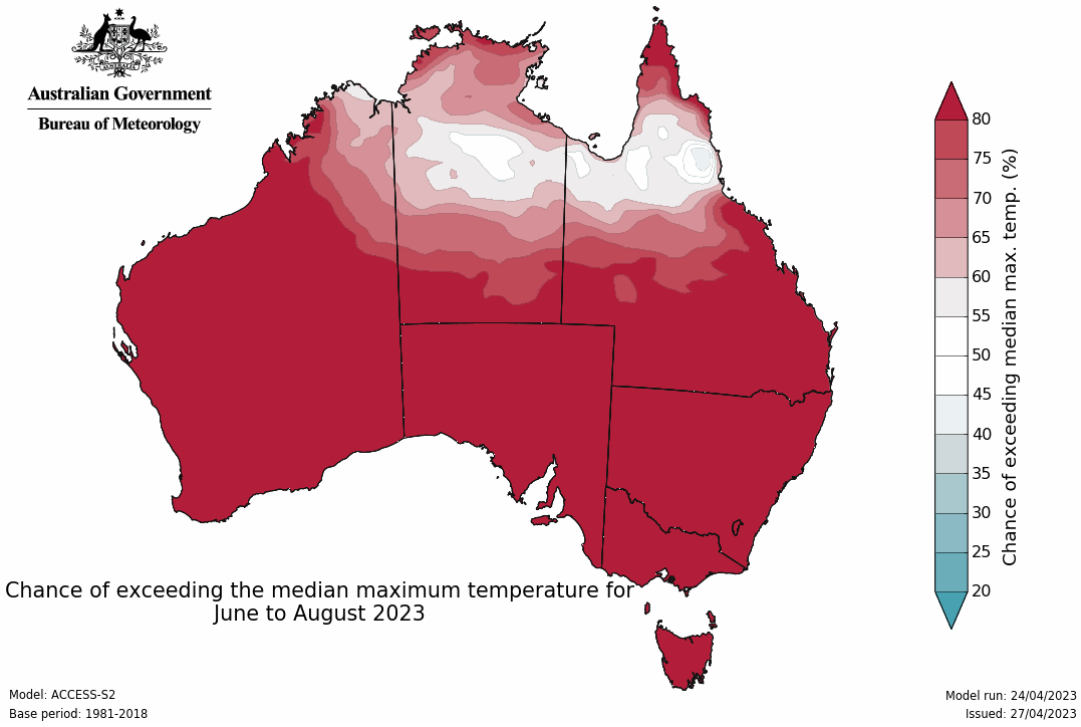
Improved
Similar or unchanged
Potential to get worse

Impact		Comparison to last winter
Extreme cold snaps	🟡	Drier and warmer conditions expected but potential for extreme cold snaps still exists.
Widespread flooding	🟢	Lower than average rainfall expected reducing risk of flooding.
Extreme peak demand	🟡	Similar for electricity, historically winter demands are higher in NSW region. Potential for gas shortfalls during coincident peak gas consumption and GPG demands in the NEM.
Generation availability	🟢	More VRE/BESS capacity and available scheduled generation expected in the NEM.
Network outages	🟢	Less scheduled electricity High Impact Outages (HIOs). No major outages of gas system plant.
Reliability	🟡	Similar unserved energy (USE) and loss of load probability (LOLP) forecast. Potential for unplanned plant outages to degrade electricity/gas system reliability.
Fuel supply	🟡	Similar. Improved coal stockpiles. Gas storage levels are generally at high levels while Vic gas production capacity has decreased, increasing the amount of gas required from Qld. Operational restrictions for some hydro power stations.
Health of markets	🟢	Improved financial position, prudential risks are comparably lower than for winter 2022.

Note: It should be noted that climate model accuracy is typically low at this time of year and scheduled information on generation and transmission is subject to change.

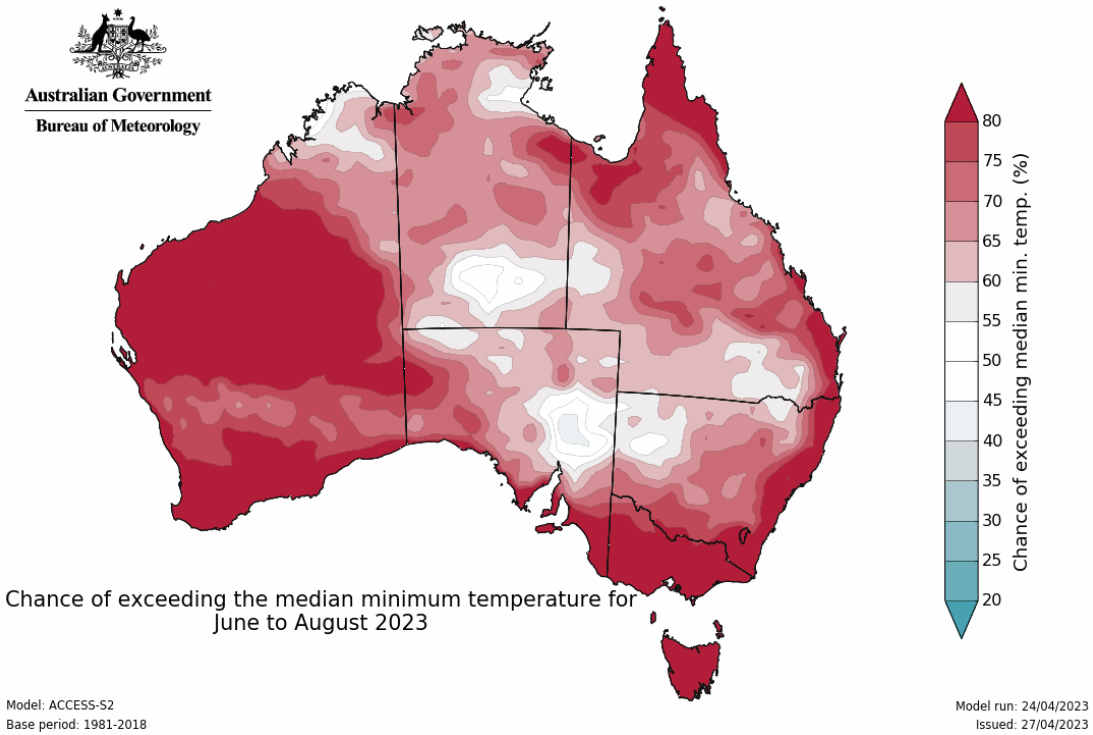
June to August 2023: climate outlook

Maximum temperatures 27 April 2023



Maximum temperatures are likely to be above median for majority of the country.

Minimum temperatures



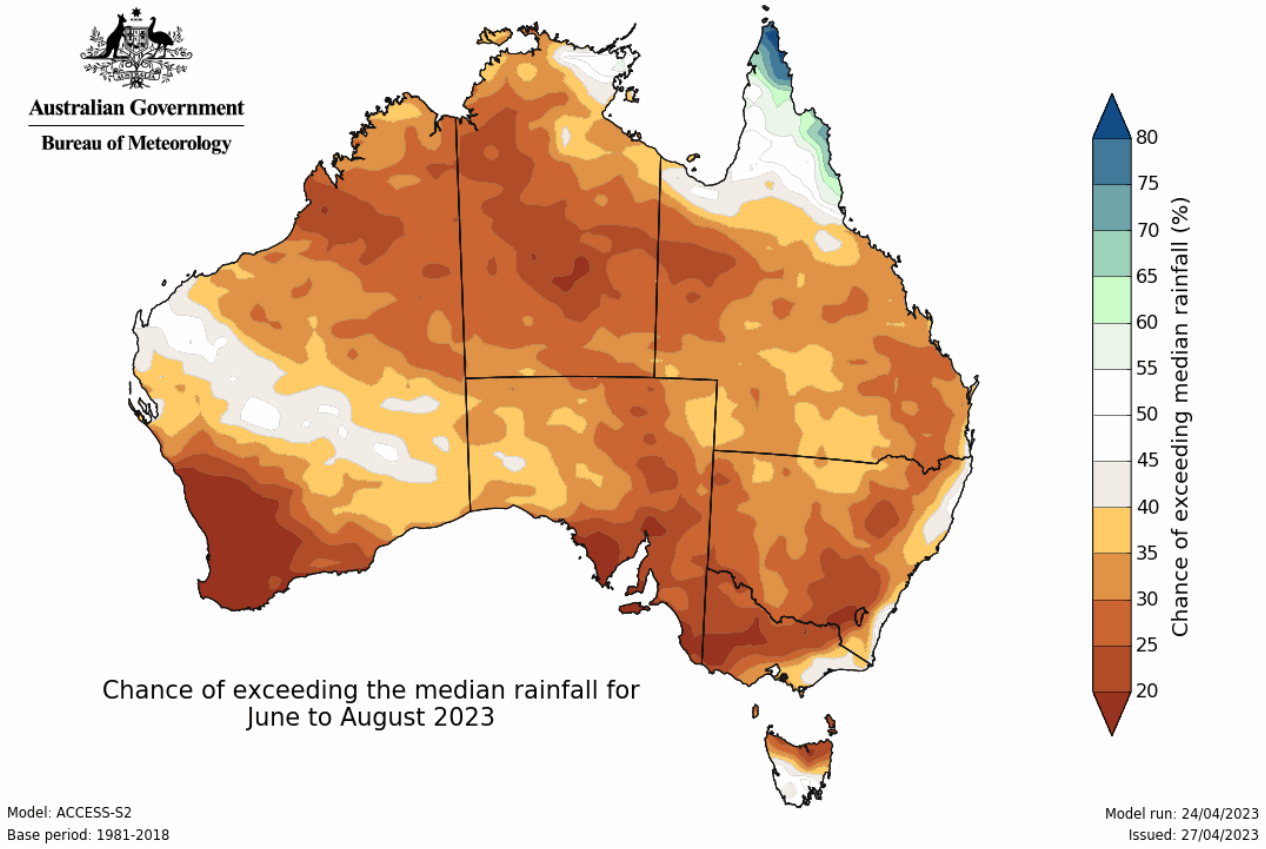
Minimum temperatures are generally likely to be warmer for WA, Vic and Tas and for coastal areas around the country.

Although maximum temperatures are generally expected to be warmer than average during El Niño year, decreased cloud cover often leads to cooler-than-average night-time temperatures during winter–spring, particularly across eastern Australia. For example, regions of southern New South Wales and northern Victoria can experience 15–30% more frost days during El Niño than the historical average.

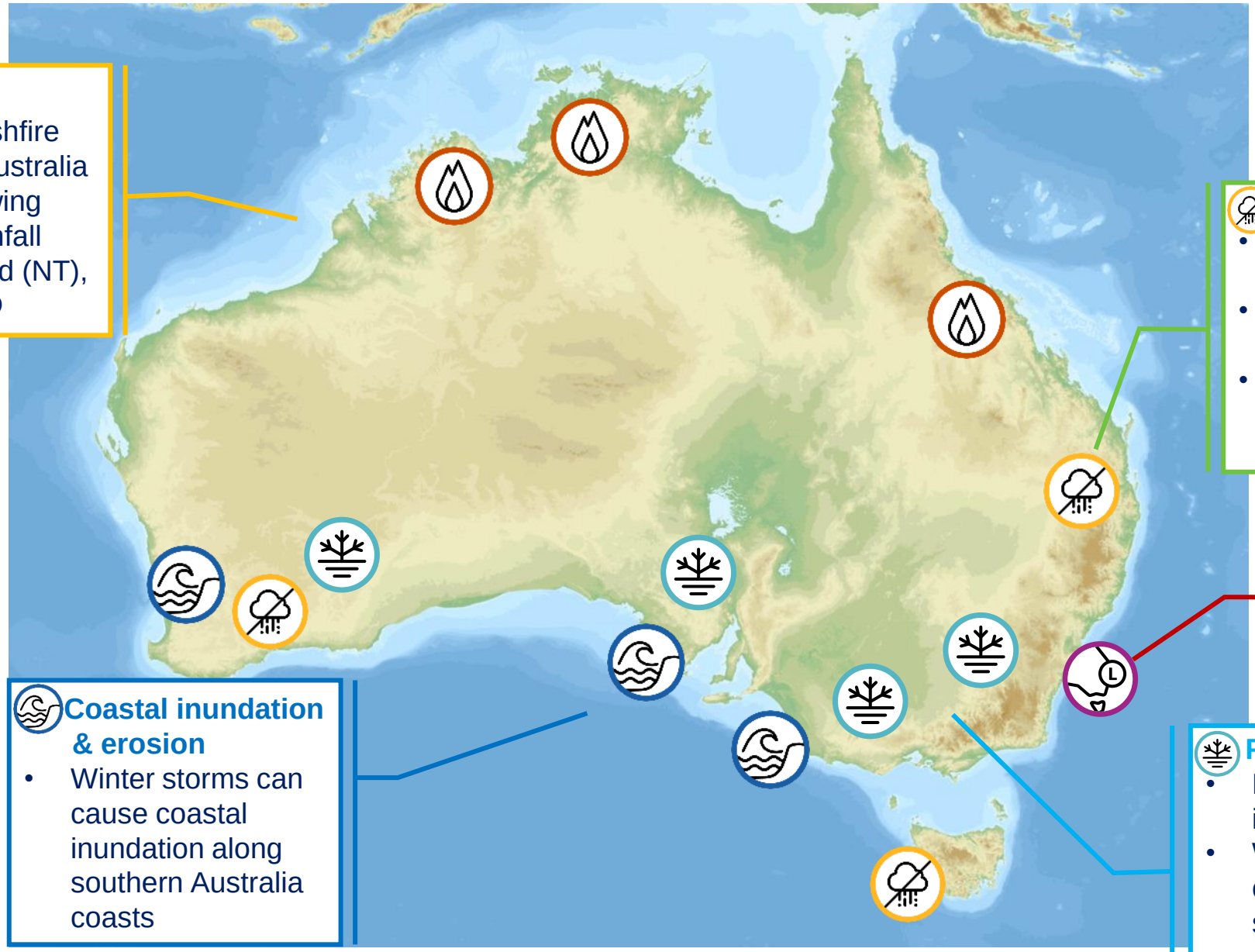
June to August 2023: climate outlook

Rainfall (27 April 2023)

- Median to above-median rainfall likely for northern Australia, coastal areas of NSW, southern Tas and parts of WA.
- Below-median rainfall likely for majority of the eastern states and south-west WA.



Regional hazards: May – August 2023



Fire danger
- Moving into peak bushfire period for northern Australia
- High fuel loads following good wet season rainfall
- Watchpoints: Top End (NT), N WA, central E QLD

Drought
- Low rainfall recent months
- Dry outlook until at least spring
- Watchpoints: SE QLD, W TAS, SW WA

East Coast Low
- Winter to early spring is peak risk period for East Coast Lows

Coastal inundation & erosion
- Winter storms can cause coastal inundation along southern Australia coasts

Frost
- Dry outlook suggests increased frost risk
- Watchpoints: Grain-cropping regions across southern Australia

Source: Bureau of Meteorology (2 May 2023)

Generation availability

- Approximately 2200 MW of additional VRE / BESS capacity is expected to be operationally available in the NEM compared to winter 2022. Note: solar capacity factor is significantly lower during winter months.
- On average, additional 2300 MW of scheduled generation is PASA available in the NEM compared to winter 2022.
- Hydro generation:
  - Limited by water licence, dam levels, available airspace, and riverbank capacity
- Coal generation:
  - Heavy rainfalls in eastern states have the potential to impact coal quality/deliveries
  - Coal stockpiles have improved as the major generators rebuild stockpile levels.
  - Several major generating units are taking planned outages during winter:
    - QLD, Gladstone 5 and Wivenhoe 2
    - NSW, Bayswater 1
    - VIC, Yallourn 2 and 3
    - SA, Torrens Island B2
- Gas/diesel generation:
  - No constraints on gas usage, potential shortfalls on coincident peak consumption days.

Significant generation capacity changes (since winter 2022) are shown in tables below, increase in renewable resources and BESS will help manage overall reduction in dispatchable capacity. On balance additional 971 MW of generation capacity is expected in the NEM.

+

Region	Capacity (MW)
NEM	2200 MW – Wind/Solar/BESS
SA	Bolivar (127 MW), Mintaro (75 MW)
QLD	Swanbank E (365 MW)

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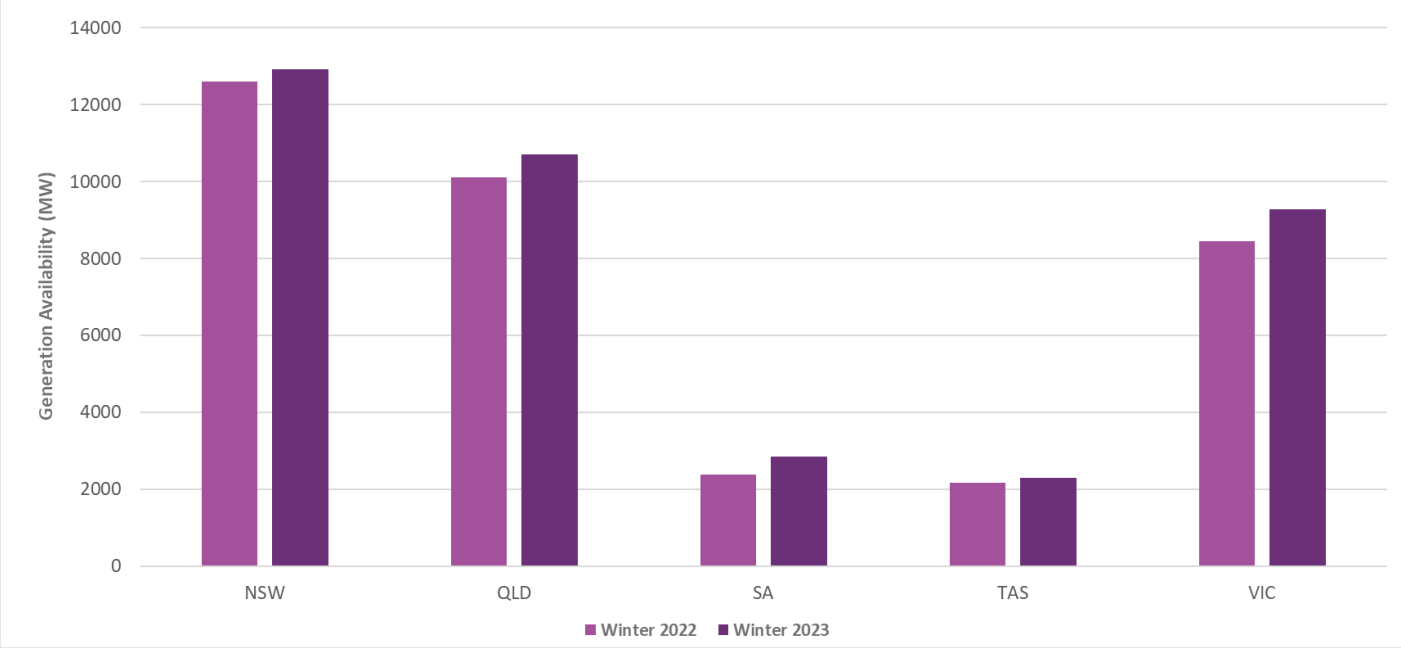
Region	Capacity (MW)
NSW	Liddell (1260 MW) – retired
VIC	Jeeralang B1 (70 MW)
QLD	Callide C3 (466 MW)

Scheduled generation availability (MTPASA - 6 April 2023) chart shows increased dispatchable generation availability in the NEM (2300 MW) compared to winter 2022. Generating units impacted by outages / coal supply issues in the NEM during winter 2022 are bidding available with sufficient fuel supplies for winter 2023.

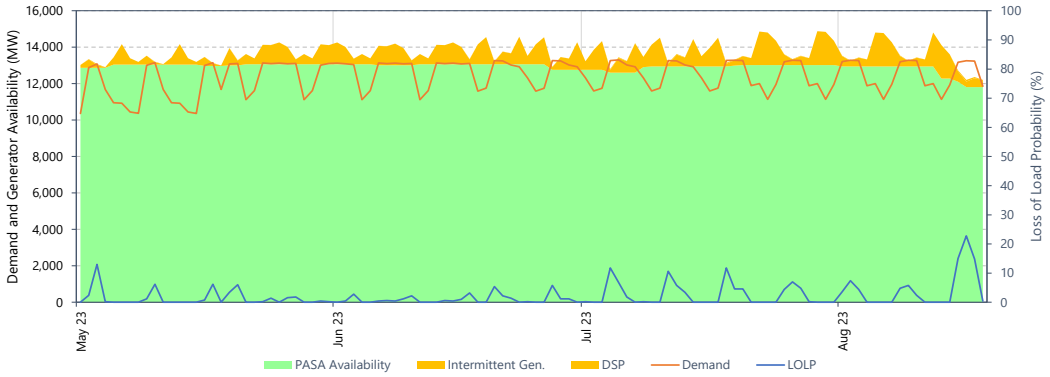


Operational demand

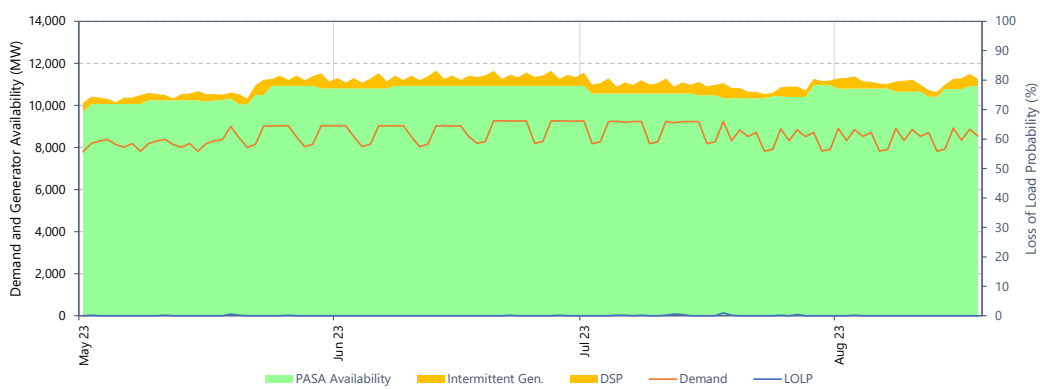
- Forecast USE is within both the interim and reliability standards for all NEM regions during winter 2023. Risk of load shedding remains where high demand days combine with low VRE availability and or scheduled generation and network outages, however risk of load shedding is low as indicated by LOLP studies.
- Historically NSW region recorded high electricity demand during winter months due to high heating load.
- Historically minimum record demands occurred during shoulder seasons. Low demand periods during winter are more likely to occur during weekends and public holidays.

Loss of load probability study

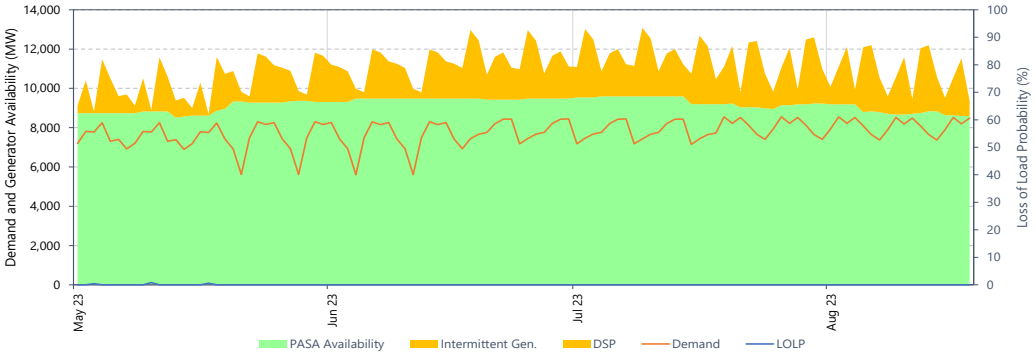
NSW



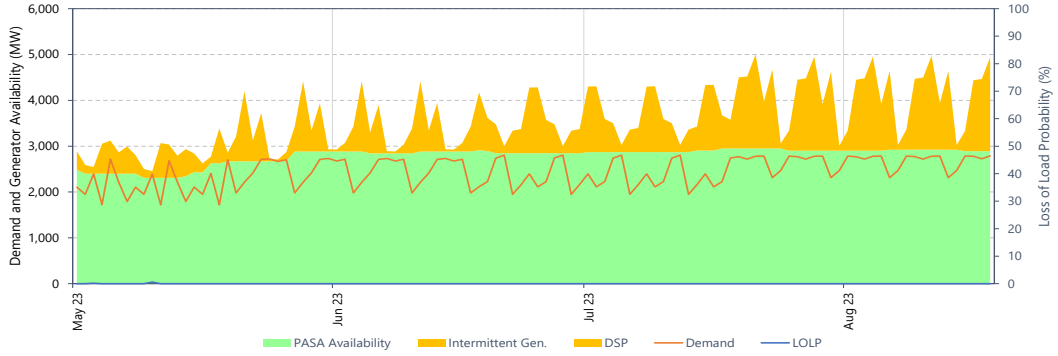
Queensland



Victoria



SA



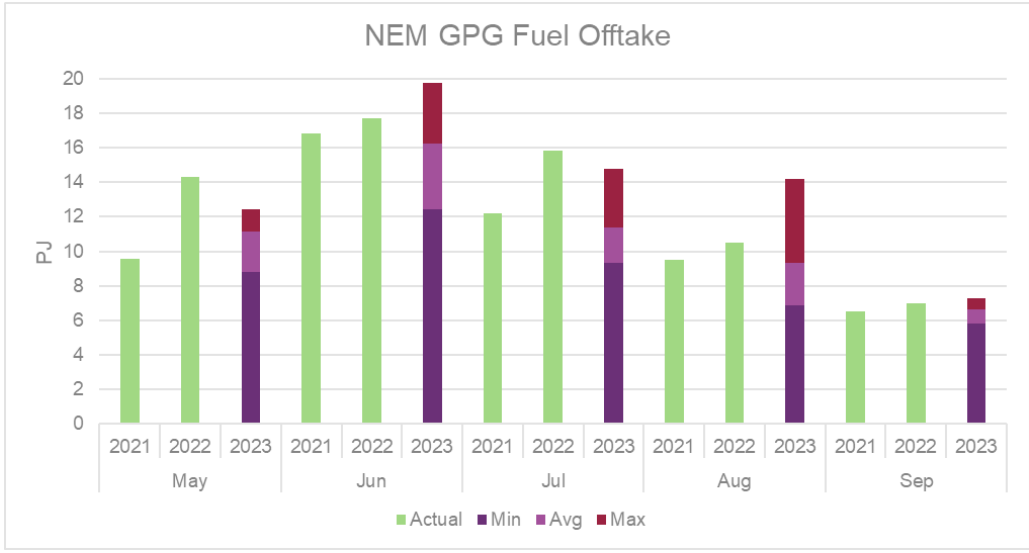
LOLP is low during winter in NSW region. All other regions have very low LOLP. Tasmania has no LOLP periods during winter and for that reason no chart is provided.

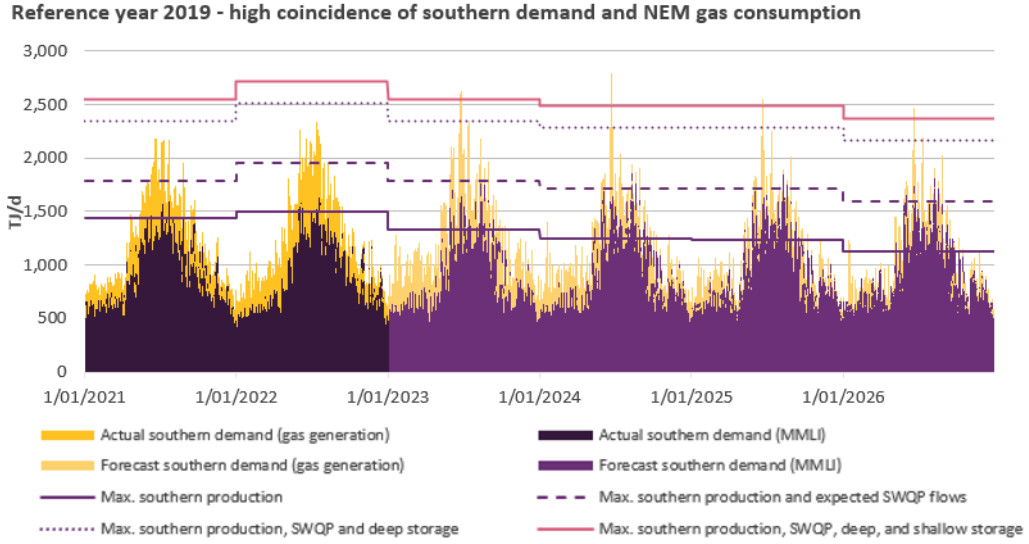
Note: MTPASA run 655 (11 April 2023), **period shown is 15 May 2023 to 31 August 2023**.

GPG Supply Adequacy – East Coast

- Forecasts show potential for similar or slightly higher NEM Gas-Fired Power Generation (GPG) fuel offtake levels compared to actuals recorded in 2021 and 2022.
- GPG demands during winter months are increasing (traditionally being highest in summer), as consumers electrify heating loads, winter gas generation peak demand will increase in magnitude and peakiness within the next five years.
- Gas storage is currently at high levels. There are no major outages impacting gas production leading into winter however Longford production levels have reduced by 20% from last winter, increasing the reliance on winter gas supply from Queensland.
- Despite falling annual gas consumption, the value of GPG in firming the NEM remains critical.
- Peak day shortfalls are forecast from 2023 under extreme peak days with high regional coincidence (including gas generation needs).
- Deep (Iona) and shallow (Dandenong and Newcastle LNG) storages are critical to meet peak day demand.
- Northern gas (Qld) must be made available to southern consumers (NSW, Vic, SA and Tas) at pipeline capacity to mitigate shortfall risks.

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

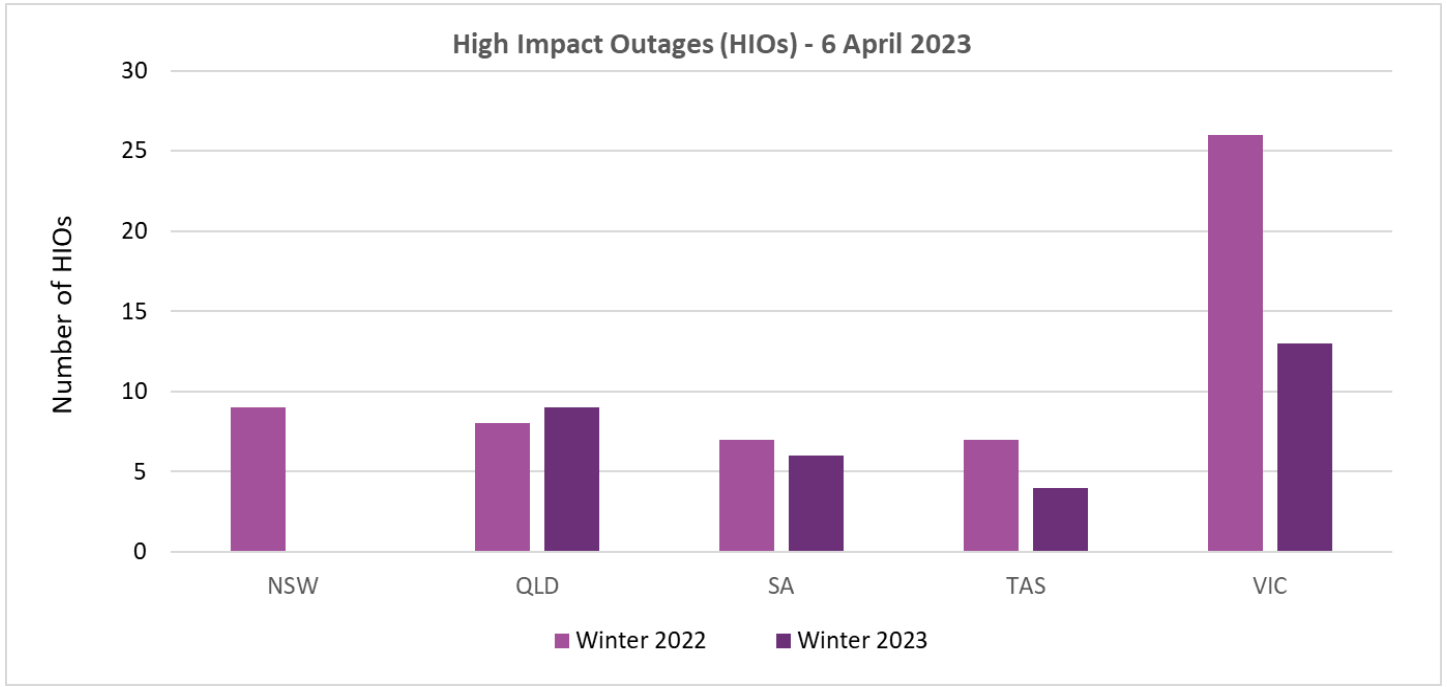




High impact outages & augmentations

- Number of planned HIOs has decreased for most regions.
- QLD outages relate to maintenance/commissioning of Ross No. 3 275 kV transformer and 275 kV feeders out of Nebo/Strathmore.
- VIC outages relate to maintenance works on 500 kV lines out of Moorabool.
- Multiple VIC-NSW and VIC-SA interconnector related outages are scheduled in June/July.
- SA outages relate to maintenance activities on South-East to Heywood and Tungkillo to Tailem Bend 275 kV lines.
- TAS outages relate to maintenance on Gordon to Chapel Street 220 kV lines.

Note: HIOs are allowed to proceed if there are no identified system security issues.



Inter-regional augmentations:

- QNI transfer capacity increases:
  - Additional 150 MW NSW to QLD capacity compared to winter 2022.
  - Possible 100 MW QLD to NSW capacity increase during winter 2023.

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

Reliability Emergency Reserve Trader (RERT)

- 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.
- Short notice RERT costs are only incurred if reserves are pre-activated or activated, as such reserves are not guaranteed to be available.
- Typically, short notice RERT panel agreements were designed to cover the summer months only, however AEMO is now encouraging 12-month panel membership with extension options.
- Last winter the NEM experienced coal and gas limitations which resulted in supply scarcity. AEMO used short notice RERT to manage the supply scarcity and the risk of credible contingencies causing involuntary manual load shedding.

Network and generation risks

Risks	Mitigation
Network and generation forced outages exceeding limits historically observed.	• Overall scheduled generation availability has improved compared to winter 2022 in the NEM. • AEMO is monitoring generation availability across all regions. • RERT Panel.
Network and generation maintenance / commissioning activities extending beyond target completion dates.	• AEMO is working closely with TNSPs and Generators to understand delays/modifications to planned maintenance due to resourcing issues, sourcing of replacement parts or other reasons. • Risk managed through ACCC interim authorisation maintenance co-ordination for QLD, NSW and VIC (expired in April, new application being sought).
Storms and flooding impacting coal supply and transmission in the NEM.	• Contracting coal from diverse sources and building up coal stock. • Monitor coal generation availability and stockpile levels. • Monitor risks with asset owners.
Bushfires/grassland fires impacting fuel supplies (coal or gas production), generation or network assets.	• Monitor risks with asset owners. • Contingency plans in place.
Unplanned network events including during high/low demand periods.	• Minimum Demand Framework and contingency plans in place.

Existing plant issues

Issues	Impacted Region(s)	Impact
QNI capacity increase - commissioning tests dependent on market conditions.	Qld, NSW	Potential delays to QNI capacity increases.
Hydro generation environmental constraints.	NSW	NEM reserves.
Callide C units return to service delayed due to technical issues: • Callide C3 staged return to service commencing 07/01/2024 (233 MW) with full capacity of 466 MW from 18/02/2024. • Callide C4 staged return to service commencing 19/05/2024 (210 MW), and 420 MW from 06/07/2024.	Qld	NEM reserves.
Jeeralang B1 (70 MW) is on extended outage due to technical issue. There is a possibility of this outage extending beyond 01/01/2024 due to difficulty in sourcing replacement parts.	Vic	NEM reserves.
Para 2 275 kV SVC is out of service until September 2023.	SA, Vic	Constraint on Heywood interconnector.
Lismore 1 132 kV SVC is out of service until 16 June 2023.	NSW, Qld	Constraint on Terranora interconnector.

East Coast Gas System

Manager - Gas Reform Implementation, Robbie Flood

Ensuring energy supply for consumers

- On 12 August 2022, Energy Ministers agreed to take a range of actions to support a more secure, resilient and flexible east coast gas market.
- These changes empowered AEMO to better identify and respond to reliability and/or supply adequacy threats and better manage periods of volatility:
  - Stage 1: monitor, communicate and respond to threats by winter 2023
  - Stage 2: to facilitate more efficient responses by industry to be implemented post 2023

Wholesale Gas Markets

- **DWGM** - Victorian Declared Wholesale Gas Market (AEMO is also the system operator for the Victorian gas transmission system).
- **STTM** – Wholesale gas Short Term Trading Market in Adelaide, Sydney and Brisbane
- **GSH** – Gas Supply Hub in Queensland, New South Wales and South Australia
- **PCT/DAA** – Pipeline Capacity Trading including a Capacity Trading Platform and Day Ahead Auction for east coast transmission pipelines.

East coast gas system – Stage 1

Transparency
New and existing participant disclosure obligations to enable AEMO to assess the likelihood of threat to the reliability or adequacy of gas supply.

Signalling
Establishing a register of contacts to communicate information about risks or threats, including the ability to hold conferences.

Directions powers
AEMO can give directions to gas industry participants to resolve an identified risk or threat. This includes an interim compensation framework.

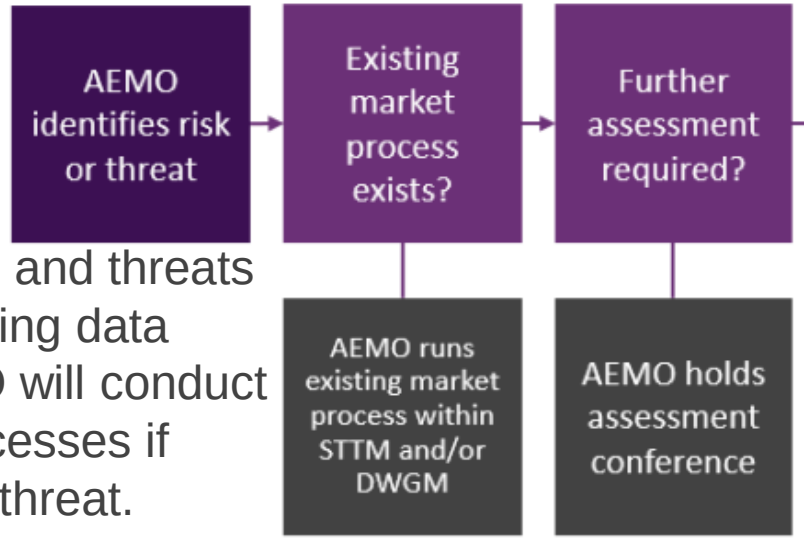
Trading
AEMO can trade in natural gas to maintain or improve the reliability or adequacy of gas supply in the east coast gas system. AEMO must establish a $35 million trading fund.

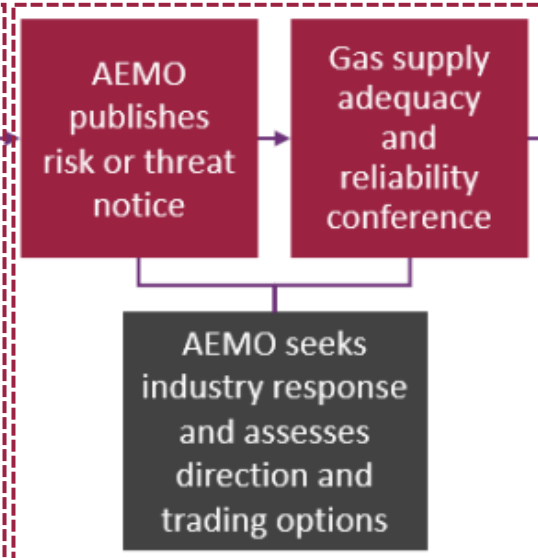
In effect, Stage 1 will provide AEMO with the initial hierarchy of tools to manage supply shortfalls in the east coast gas market, prior to more formal tools being designed.

AEMO's new functions

Transparency and assessments

AEMO will monitor and assess for risks and threats using new and existing data submissions. AEMO will conduct existing market processes if relevant to a risk or threat.



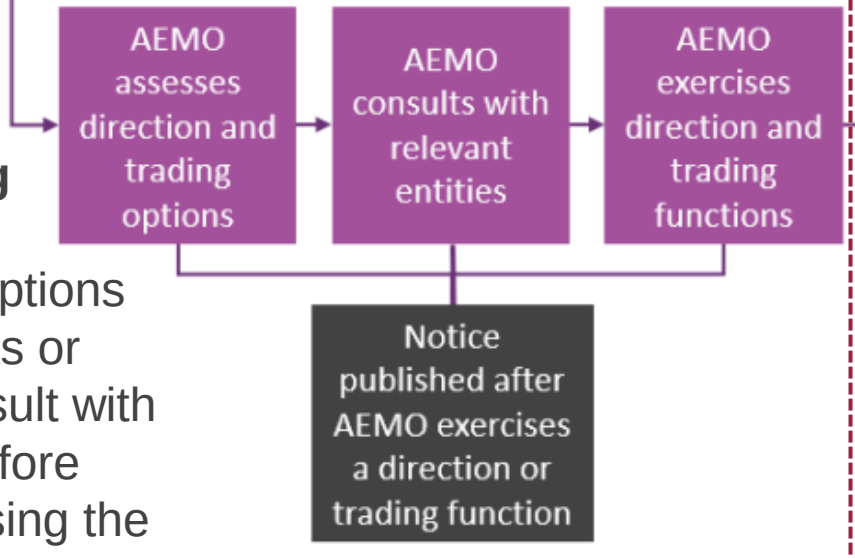


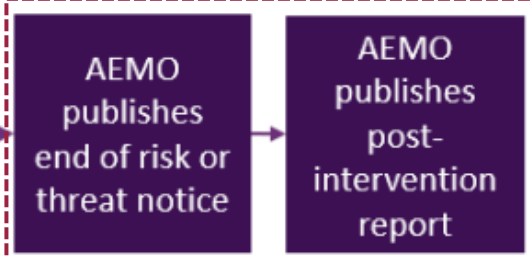
Signalling

AEMO will always publish notice of an identified threat and seek an industry response.

Directions and trading

AEMO has last resort options available to resolve risks or threats. AEMO will consult with relevant participants before issuing a direction or using the trading fund.





Reporting

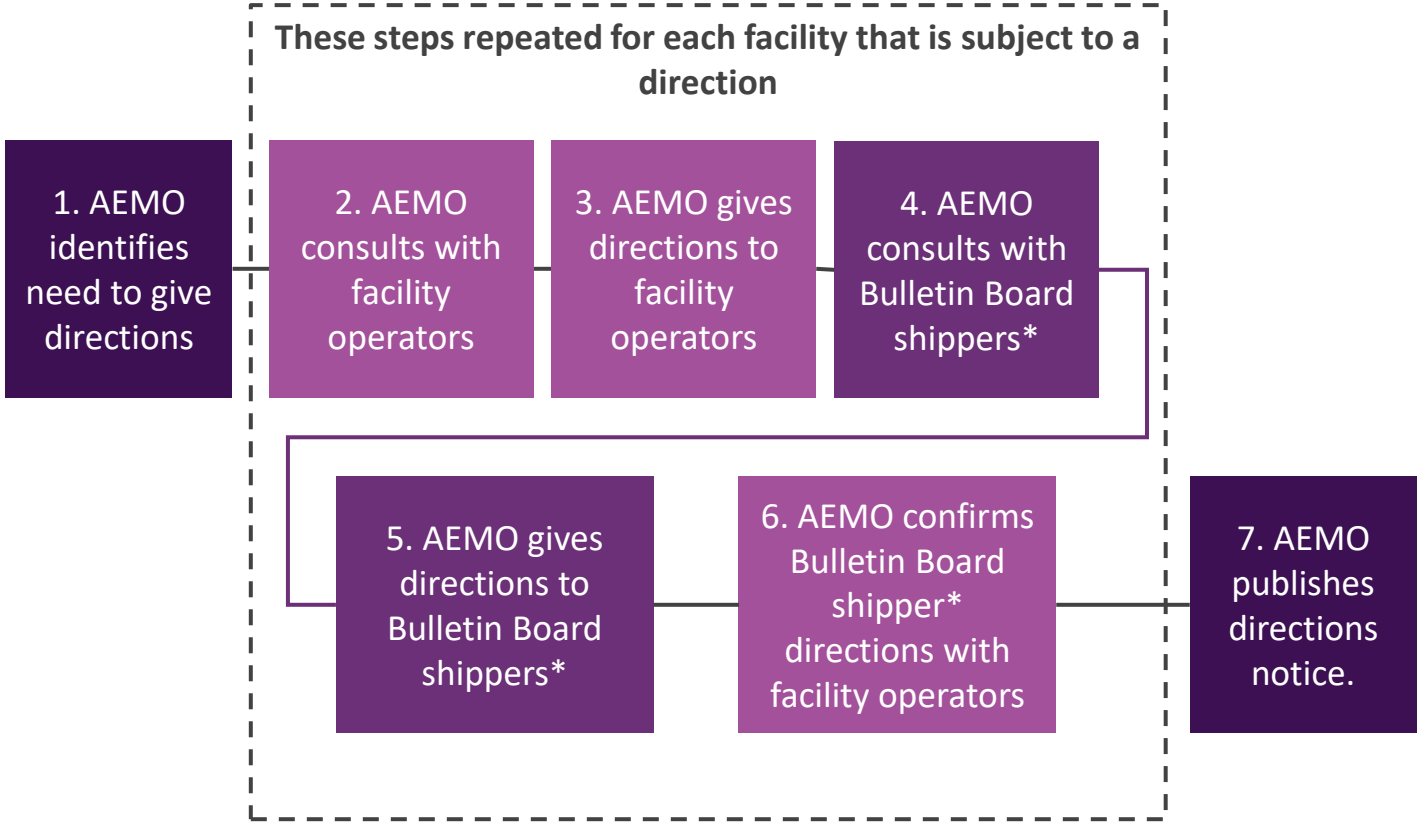
AEMO will produce a post-intervention report following the issuing of a direction or use of the trading function.

Existing market mechanisms

- AEMO has other processes in place that, if relevant, will be used prior to the east coast gas system reforms to address a potential risk or threat
  - STTM contingency gas - allows AEMO to publish an intraday schedule in response to a supply event that may develop into an identified risk or threat
  - DWGM threat to system security process - allows AEMO to undertake a variety of actions in response to a threat in the DWGM that may develop into an identified risk or threat.

Directions process

- AEMO may decide to give a direction if previous processes and industry response have not successfully mitigated a risk or threat.
- Before giving a direction, AEMO aims to consult with facility operators and shippers with a view to maximise the likelihood that actions undertaken in accordance with the direction will mitigate the identified risk or threat.

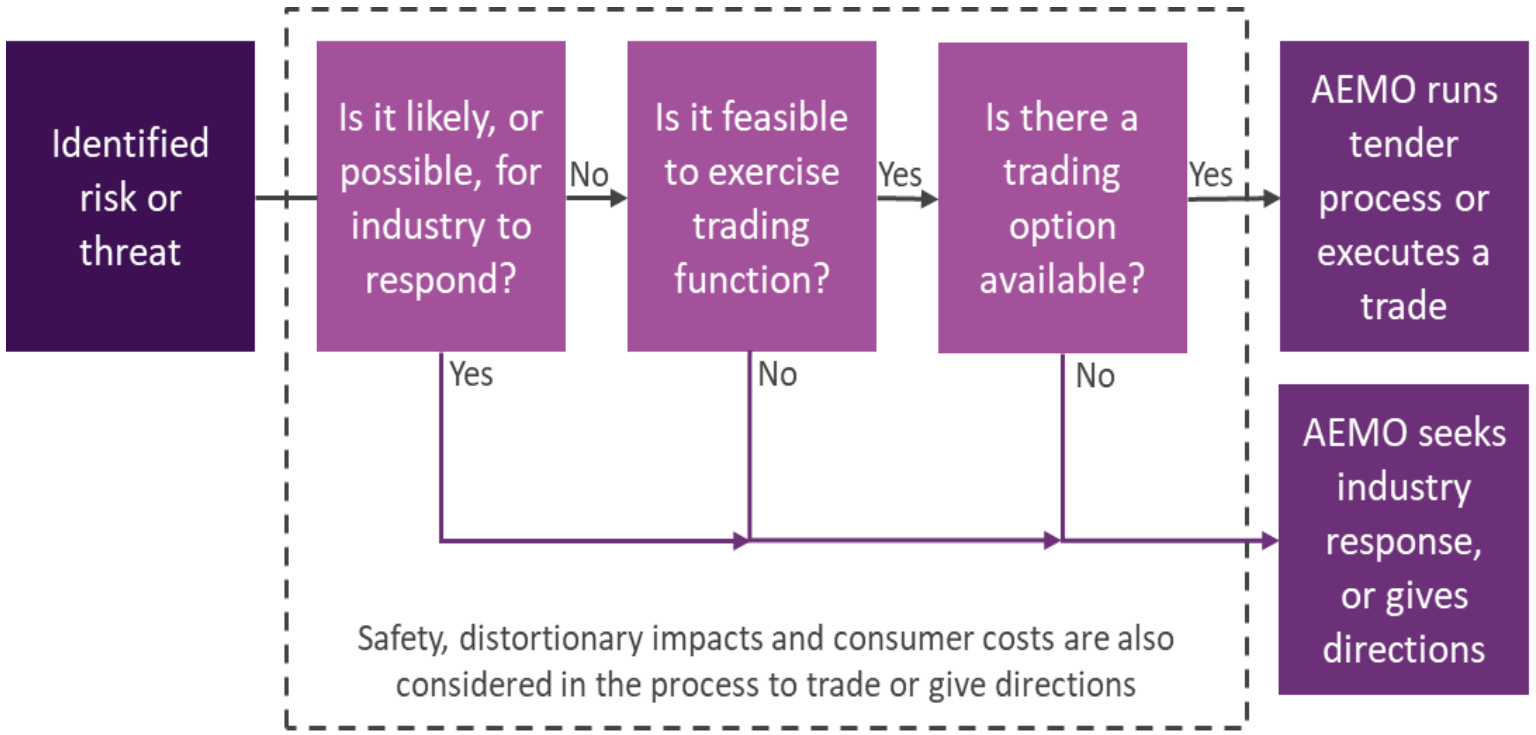


*Bulletin Board shippers are gas providers who has contracted pipeline capacity

Directions/trading are last resort options

Trading process

- If AEMO determines that the most effective method to resolve a risk or threat is to trade in natural gas, AEMO plans to run a tender process.
- AEMO will conduct trades in a transparent manner.
- AEMO will seek to minimise distortionary impacts of a trade.



Directions/trading are last resort options

Costs

Impacts on the east coast gas system and to industry and consumer costs should be minimised.

Directions

- Consultation prior to giving directions.
- Development of a hierarchy of response for issuing directions.
- Utilising existing contracts where possible.

Trading

- AEMO's preference is to not trade in its own markets; or act as a trader of gas/capacity.
- When exercising the trading function AEMO's preference is to use a 'services' model, where AEMO tenders for services directly from participants.
- Approach to the Trading Fund reduces cost.

The directions process includes a compensation framework that is paid for by the jurisdiction where the threat was located. Similar to recovery of any trading that AEMO conducts.

Budget & Fees – Summary of feedback and AEMO's response

Manager, Planning and Partnering, Strategic Finance, Yogesh Nagarajan

We have genuinely sought to provide more transparency and opportunity for feedback

- Consultation began ~5 weeks earlier
- Presented at AEMO consumer forum 20 April 2023
- Hosted a webinar 1 May (3 attendees of 11 registered)
- Offered a survey for ease of response (1 incomplete response)
- Sought other verbal feedback provided through discussions with participants and industry bodies.

FY24 Budget & Fees website stats 20 April – 4 May (consultation period)

- 655 unique views of the pages
- 215 unique openings of the document

Includes internal and external views of the document (cannot be distinguished).

But we acknowledge there is more we can do.

Two formal submissions

Energy Networks Australia (ENA)

- Welcomed efforts to increase transparency and certainty on costs, through forums such as the Financial Consultative Committee (FCC) and the Reform Delivery Committee.
- Supports AEMO's strategic priorities.
- Encourages AEMO to continue to work with industry to identify and deliver cost savings.
- Welcomes consultation on the current and forecast year as well as a forward estimate in the annual consultation at the detailed fee level.
- Notes there is benefit in AEMO providing a consistent and complete budgeting document from one year to the next with at least a five-year budget/forecast and estimates by fee category.

A response was provided on 18 May 2023.

Queensland Electricity Users Network (QEUN)

- Does not see AEMO as efficient and transparent and therefore stakeholder trust is absent. Seeks assurances around AEMO's ability to manage its finances given the deficit position.
- Sought clarity on annual costs of ISP over recent years.
- Urges AEMO to consider the broader impact of its costs on consumer bills as a result of secondary investment required by participants due to AEMO's work (e.g. industry costs for 5MS)
- Considers AEMO pursues its own agenda and does not sufficiently engage with stakeholders.
- Considers AEMO and industry does not adequately fund energy consumer advocacy.

A response was provided on 29 May 2023.

Proposed improvements to FY25 Budget & Fee process

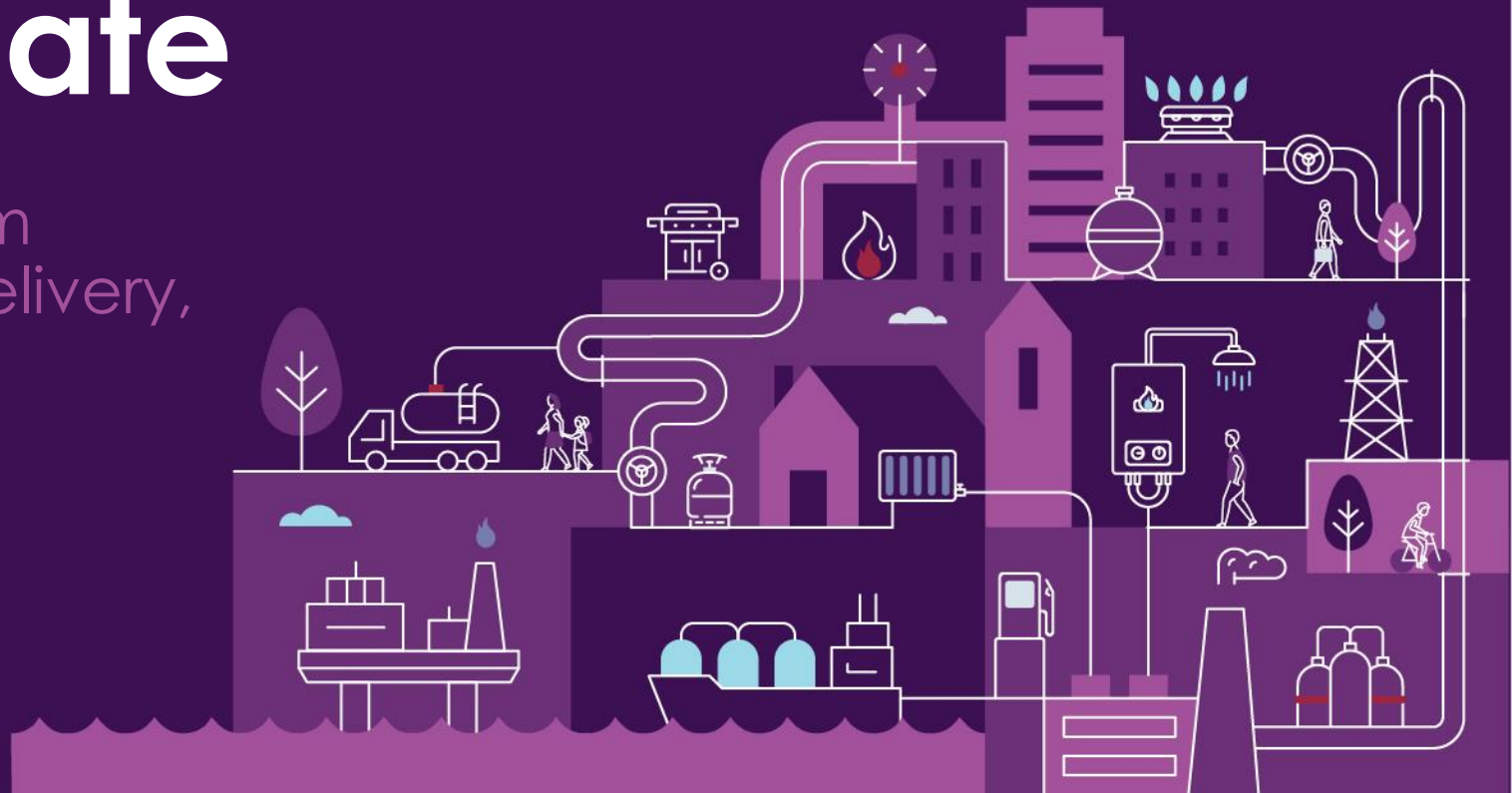
- Bring budget process forward so that consultation can occur earlier
- Start the process with strategy and priorities, then target setting in advance of drafting the budget
- Map cost increases to Strategic outcomes and present to Financial Consultation Committee (FCC)
- Provide periodic progress updates against budget and project budgets and progress to FCC
- Provide a longer-term view (noting estimation uncertainty).

Next steps

- Publish on the website:
  - engagement plan
  - submissions (where publishable)
  - AEMO's responses to submissions
  - summary of AEMO's responses and intentions for FY25 process
  - approved FY24 Budget and Fees document.

NEM Reform delivery update

Manager - Wholesale Reform Program Delivery, Reform Delivery, Chris Muffett



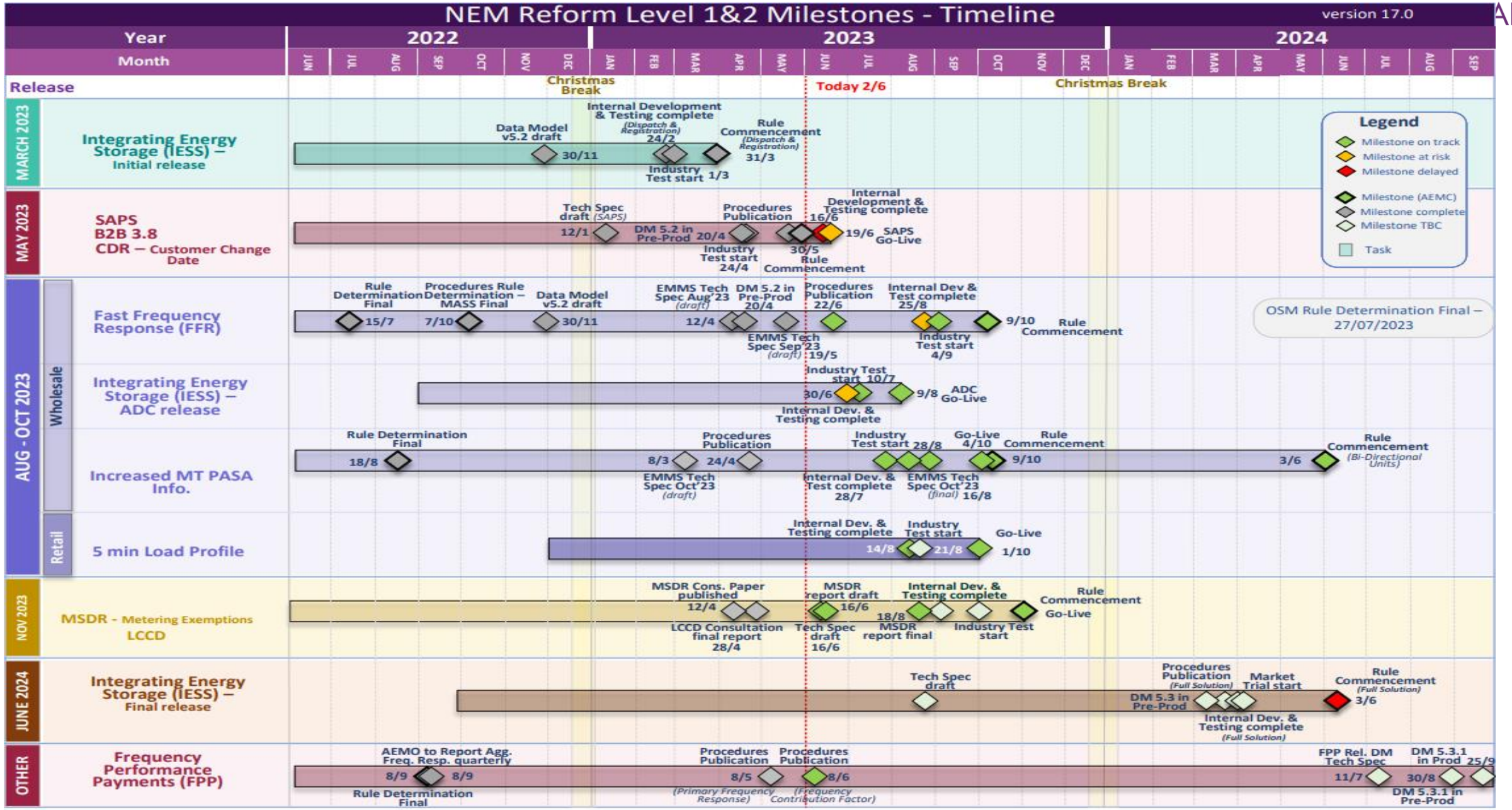
Program update

ESB Reform Initiatives

- Successful implementation of Consumer Data Rights, Business to Business CDR, B2B v3.8 and other Issue Change Forms in May 23
- Resource concerns persist in key project areas and continue to place pressure on maintaining existing timelines.
- Integrated Energy Storage Systems IESS June 24 is impacted by extended timeframes to complete build and system test across Settlements, Prudential's and Registrations and RMC applications ahead of SIT commencement. AEMO working on revised plans and approaches.
- Fast Frequency Response System Integration Testing and User Acceptance Testing test plans now in place.

Release	Initiatives	Previous status	Current status	Key points	Impacted stakeholders
MAY-23	CDR (excluding LCCD)	Delivered	Delivered	Successful implementation of first batch of performance improvements on 23 May 2023.	Major retailers
	B2B v3.8 and other ICFs	Delivered	Delivered	Successful implementation of B2B and 4 ICFs on 28 May 2023.	LNSP, FRMP, MP/MDP
	SAPS Stand alone power systems			SAPS on track for the revised 19 Jun Go live date. Amber due to lack of contingency prior to 19 Jun.	LNSP, FRMP, MP/MDP
AUG-23	Integrating Energy Storage Systems			Development Complete. SIT execution in progress. Testing re-baselined to be completed by 30 June.	Aggregate Systems
	Fast Frequency Response - Dispatch & Reg			Testing timelines have been finalised and industry test dates can be met. Amber status remains due to parallel path of AEMO test program.	Generators, Market Customers
	Fast Frequency Response			Final Service commencement plan was released 5 May. Testing timelines finalised. Amber status remains due to parallel path of AEMO test program.	Generators, Market Customers
OCT-23	5 Minute load profile			Project progressing on track.	Market Customers / FRMP
	Increased Mid-term Projected MT PASA Information			Project progressing on track.	Scheduled generators
NOV-23	Metering Exemptions (MSDR)			Project is continuing towards 1 Nov delivery	Retailers, MC and MP/MDP
	CDR (LCCD)			1 Nov effective date confirmed.	FRMPs
JUN-24	Integrating Energy Storage Systems [Final]			IESS key issues include resource capacity constraints, finalisation of functional requirements for BDU model and participant readiness for BDU and settlement changes. AEMO expect to provide a response to these issues and reviewed timelines in July PCF.	IRPs, NSPs, FRMP, MP/MDP, Vendors
JUN-25	Frequency Performance Payments			Final Frequency Contribution Factors Procedure (FCF) published 1 June 2023. Project progressing on track. Workshop underway to confirm participant impact and development timelines.	Generators, Market Customers

External milestones



NEM Reform forums update

Channel	Current focus	Next meeting
NEM2025 Electricity Wholesale Consultative Forum (EWCF)	• The current focus is on regular updates for inflight reform IESS, FFR, FPP, MT PASA, the Procedures Consultation Roadmap, and the strategic and foundational initiatives (IDAM IDX and PC). • The forum recently held a session on the Quarterly Energy Dynamics report (QED) and will be providing an update on the NEM Reform Delivery Committee at the next session.	20 June 2023
Electricity Retail Consultative Forum (ERCF)	• The current NEM Reform focus is on considering retail and metering procedural impacts associated to the introduction of the IESS Rule.	26 June 2023
Information Exchange Committee (IEC) and Business-to-Business Working Group (B2BWG)	• The current NEM Reform focus is on considering and preparing for the upcoming consultation regarding B2B procedural impacts associated to the introduction of the IESS Rule.	13 July 2023
NEM2025 Implementation Forum	• Focus on 2023 Releases – progress and implementation updates for all inflight initiatives • Present Go-live criteria and contingency approaches for FFR and ADC • Provide draft go-live plan for ADC • De-brief SAPS/May release Go-live	27 Jun 2023
NEM2025 Industry Testing Working Group (ITWG)	• Address testing approaches for ADC FFR 5MLP and MT PASA • Look at Q&A schedule for ADC testing • Confirm pre-prod refresh dates	29 Jun 2023

NEM2025 Executive Forum	• Targeting Q3 (August 2023)
	• Agenda to focus on:
	  • NEM Reform Industry Impact, readiness and mobilisation through the reforms
	  • Project budget status reporting
		August 2023 (TBC)

For more information and meeting papers for each of the forums, please refer to the NEM Reform program website.

Upcoming engagements

Forum	Dates
Electricity Wholesale Consultative Forum	20/6, 18/7, 15/8, 19/9
NEM Reform Foundational and Strategic initiatives	20/7, 26/7, 17/8
Electricity Retail Consultative Forum	26/9, 24/7, 28/8, 25/8
Industry Testing Working Group	29/9, 27/7, 31/8, 28/9
Implementation Reform	27/6, 25/7, 29/8, 26/9
Reform Delivery Committee - Collab W.	2/8
Industry Testing Working Group	29/6, 27/7, 31/8, 28/9
Executive Forum (placeholder	23/8

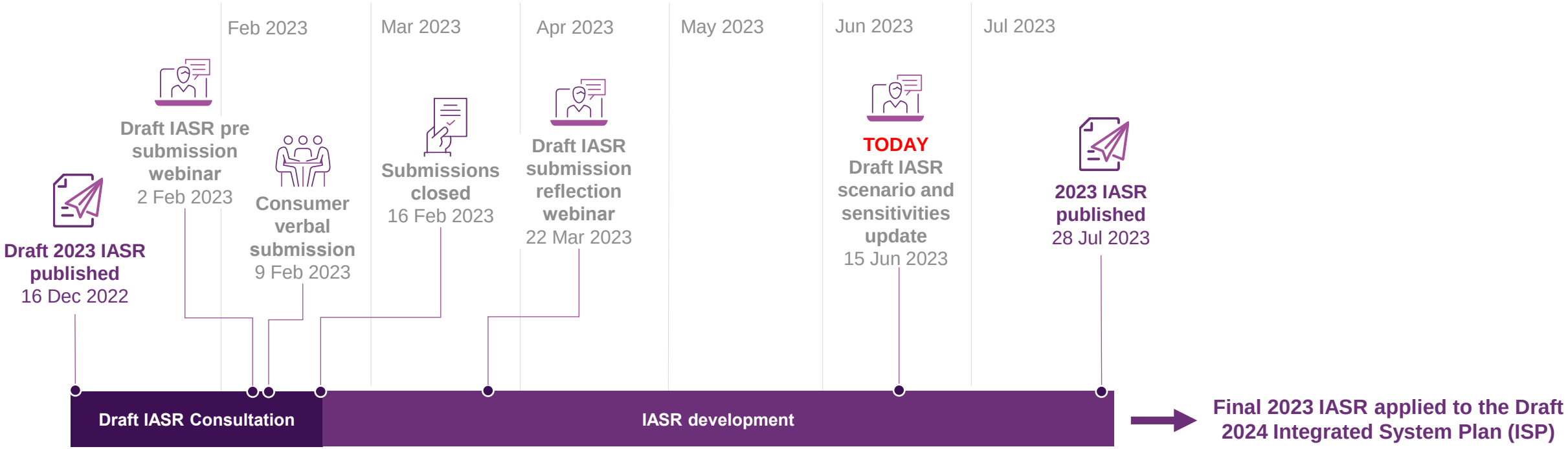
To learn more about these events, please visit AEMO's Industry meeting calendar or contact the program at NEMReform@aemo.com.au.

2023 Inputs, Assumptions and Scenarios Report (IASR)

Manager Sector Coupling, System Design, Daniel Collins

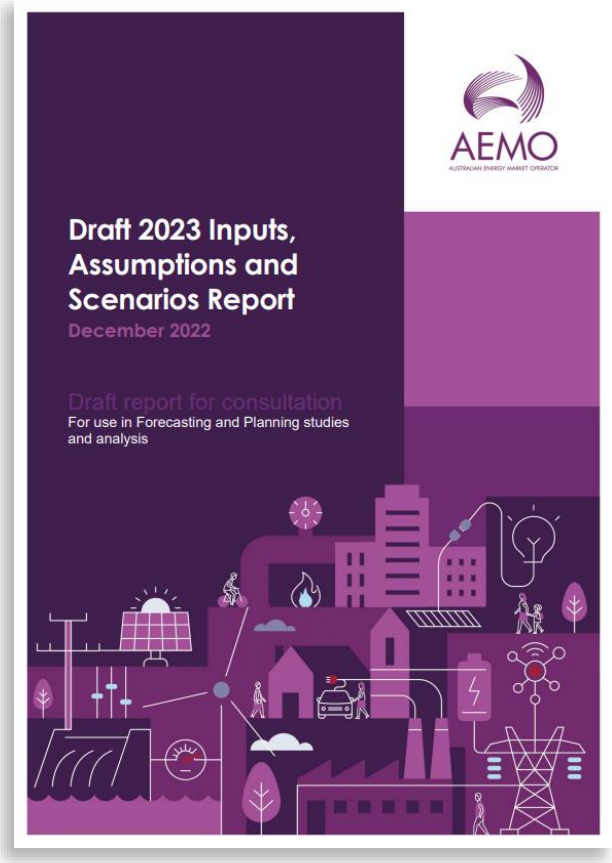
IASR in development

Draft 2023 IASR Consultation website, containing consultation documents, supporting materials and stakeholder submissions:
https://aemo.com.au/consultations/current-and-closed-consultations/2023-inputs-assumptions-and-scenarios-consultation



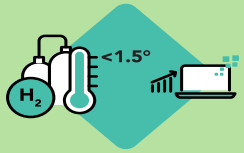
Webinar objectives

- To summarise stakeholder feedback on scenarios and sensitivities, and inform how they have evolved.
- Share how key sensitivities will provide further insights on the investment needs and risks for the energy transition.
- Provide an update on supporting engagement activities ahead of finalisation and application in the 2024 Integrated System Plan.



The draft report and its supporting materials are available here

Scenarios – recap on feedback



1.5ºC
Green energy export

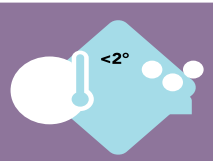
Mixed views on the scale of hydrogen, with more doubting than supporting.

Concerns that consumers would bear the scenario's infrastructure costs to support hydrogen export industries.

Many submissions sought a non-hydrogen *1.5ºC* scenario.

Many submissions were concerned with the cost and technical feasibility of hydrogen blending.

Some confusion over biomethane's role in the scenario, and some concerns over fugitive emissions from hydrogen.



1.8ºC
Orchestrated step change

General support, with range of views on consumer appetite for orchestration.

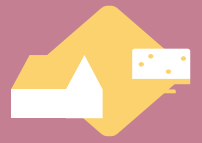
Some enthusiasm for inclusion of tariff reform and DSP.

Some concern about grid interactions (i.e., DNSP hosting capacity).

1.8ºC
Diverse step change

Mixed views, including more/less CER and VPP.

Some dislike of the gas and biomethane components of the scenario. Some considered government support for gas as implausible, but in contrast, some commented that more social licence was required to move away from existing gas use.



2.6ºC
Progressive change

Frequent concern that the scenario was inconsistent with Paris Agreement commitments, some proposed removing the scenario.

Mixed views on other scenario settings, but more wanted further downside exploration.

A wide spread of scenarios
Consideration of resilience, especially to climate change

Provide pathways to a 1.5°C-compatible transition
Inform policy, not just respond to it

Why the scenarios exist, and how they are used

Scenarios support planning in an uncertain environment, and assess future risks, opportunities, and development needs. Scenarios capture the key uncertainties and drivers of the many possible futures.

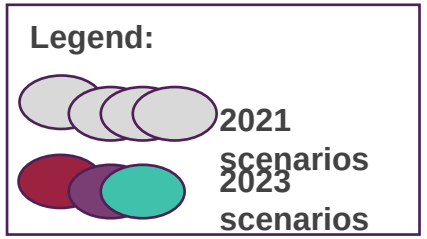
Principles of scenario design:

- Broad
- Distinct
- Internally consistent
- Plausible
- Relevant
- Developed with consideration of the AER's cost benefit analysis (CBA) guidelines, in particular to test the risk of over, under, premature or overdue investment.

Applied consistently to plan the energy transition

Sensitivities are deployed to test key areas of uncertainty around key assumptions, identify critical influences on future investments needs or impacts, or provide deeper analysis on specific areas of interest.

Since 2022, policy change shift the scenarios



Policy change increases the pace of decarbonisation

Scale of Change

Slow

Pace of decarbonisation

Fast

ABANDONED SCENARIO::
Significant policy movement has led to an abandonment of Slow Change.

All scenarios will meet Australia's 43% emissions target

Slow change

Progressive change

Progressive change

Progressive Change (2.6°C)
Technological and economic investments target only the current domestic and international ambition, leading to lower economic outcomes as more barriers than solutions exist that are not overcome.

Step change

Step Change (1.8°C)
Electrification is the primary method for meeting decarbonisation ambitions, including in high-heat industrial processes following technology improvements

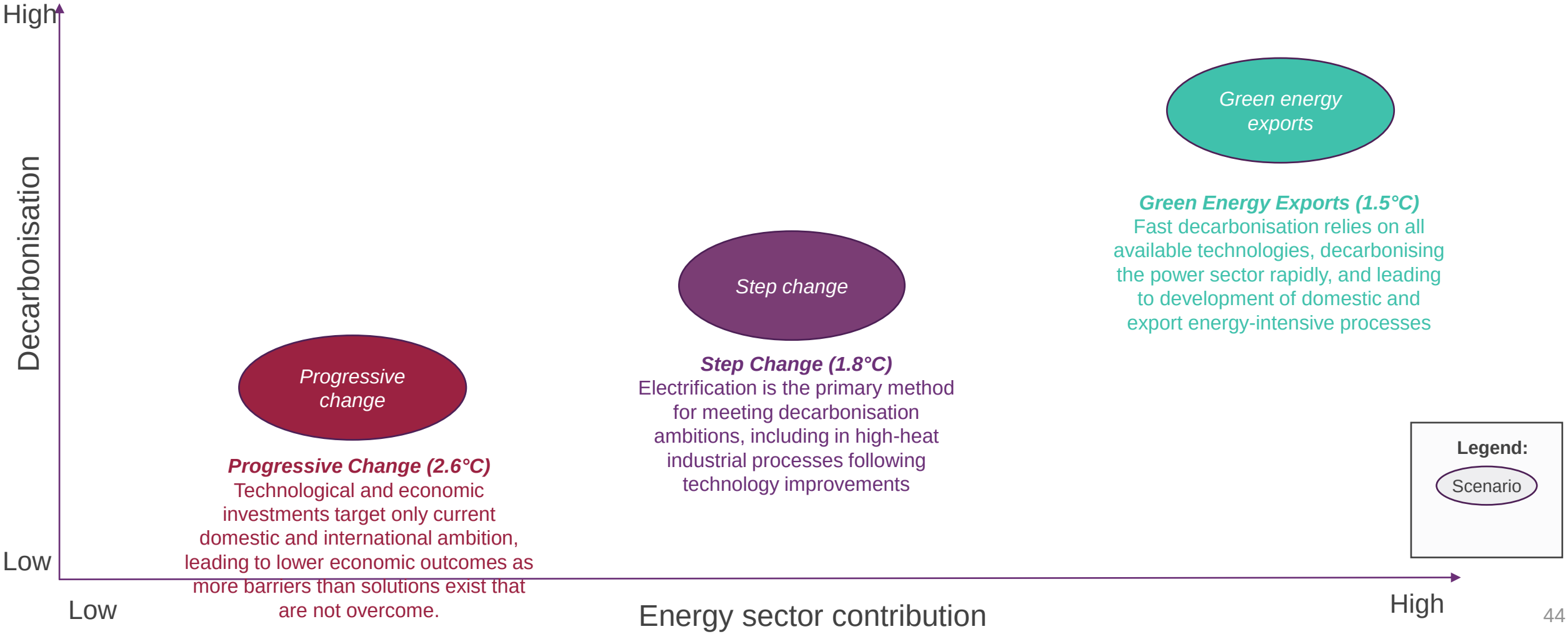
Hydrogen superpower

Green energy export

Green Energy Exports (1.5°C)
Fast decarbonisation relies on all available technologies, decarbonising the power sector rapidly, and leading to development of domestic and export energy-intensive processes

Adapting the draft scenarios given feedback

***Note the change in axes**



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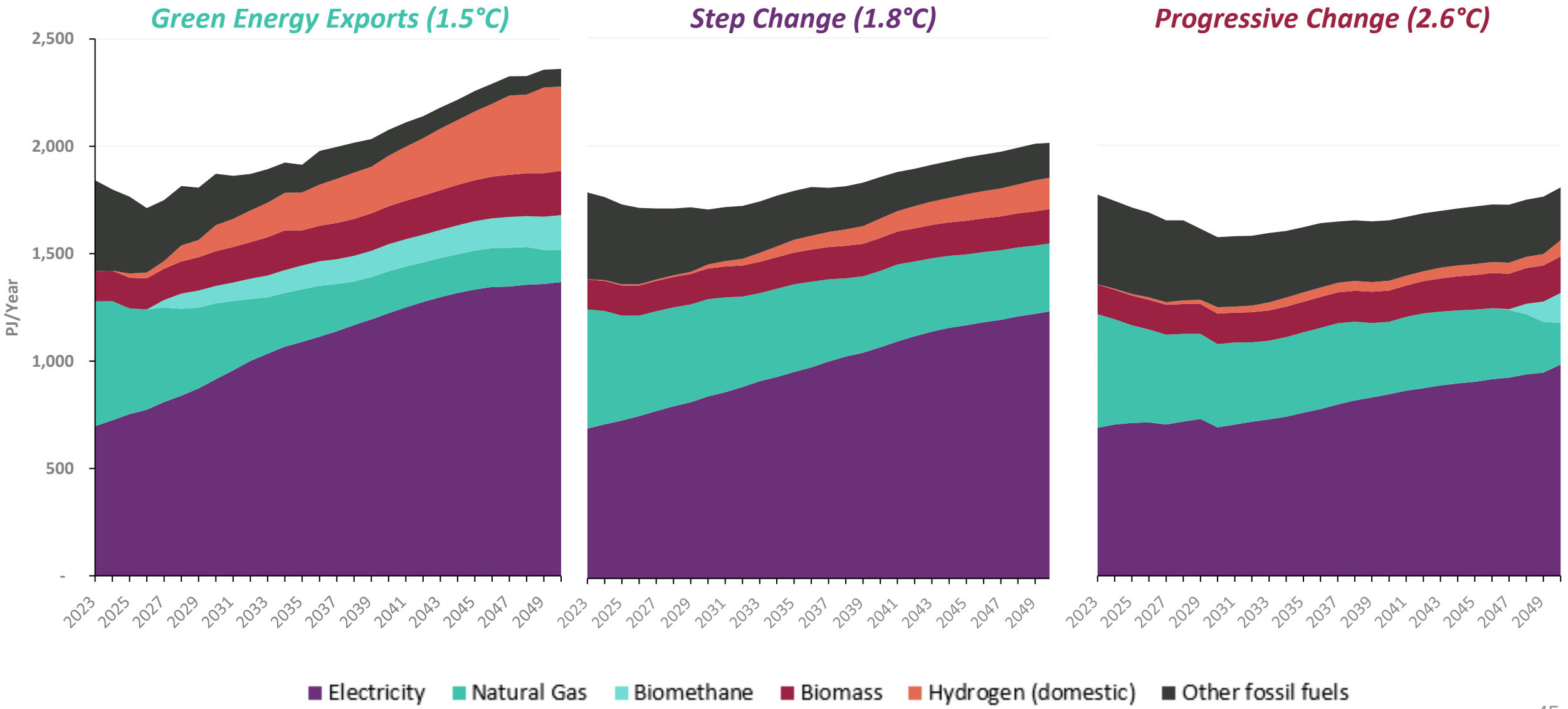
Progressive Change (2.6°C)
Technological and economic investments target only current domestic and international ambition, leading to lower economic outcomes as more barriers than solutions exist that are not overcome.

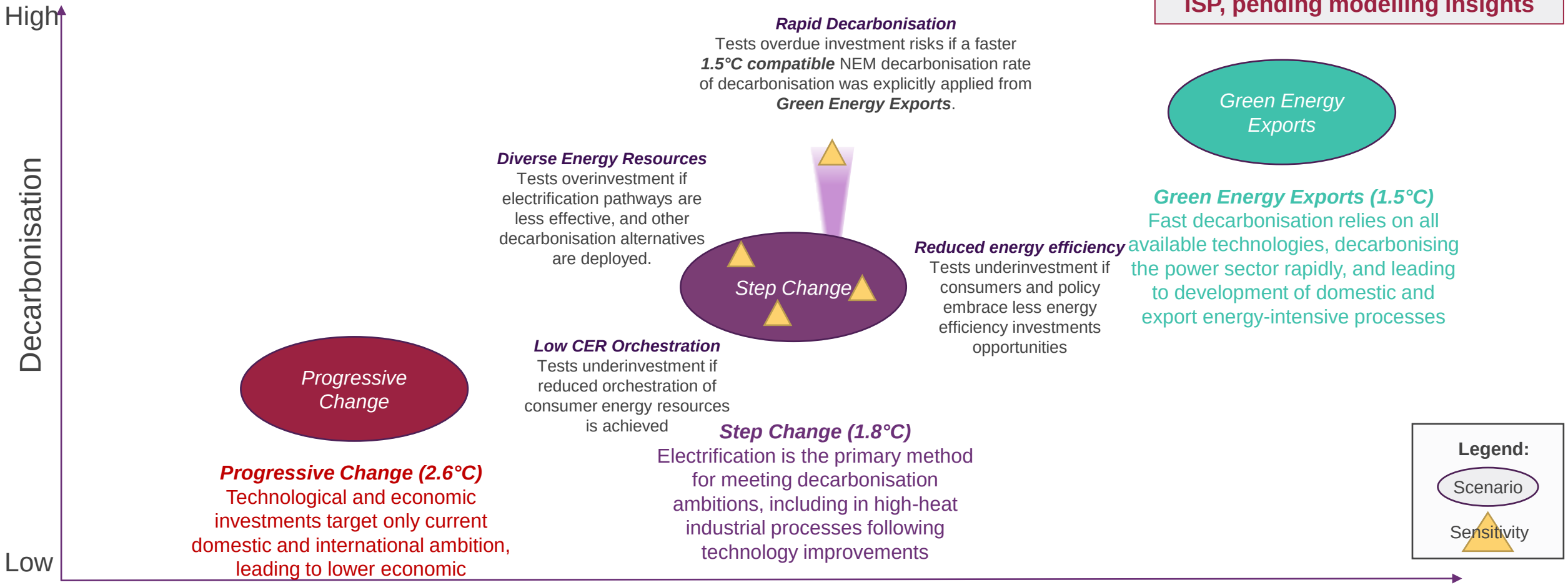
Energy usage per scenario, by fuel type



Adapting the draft scenarios given feedback, including key sensitivities

Other sensitivities will be examined within the Draft 2024 ISP, pending modelling insights

***Note the change in axes**

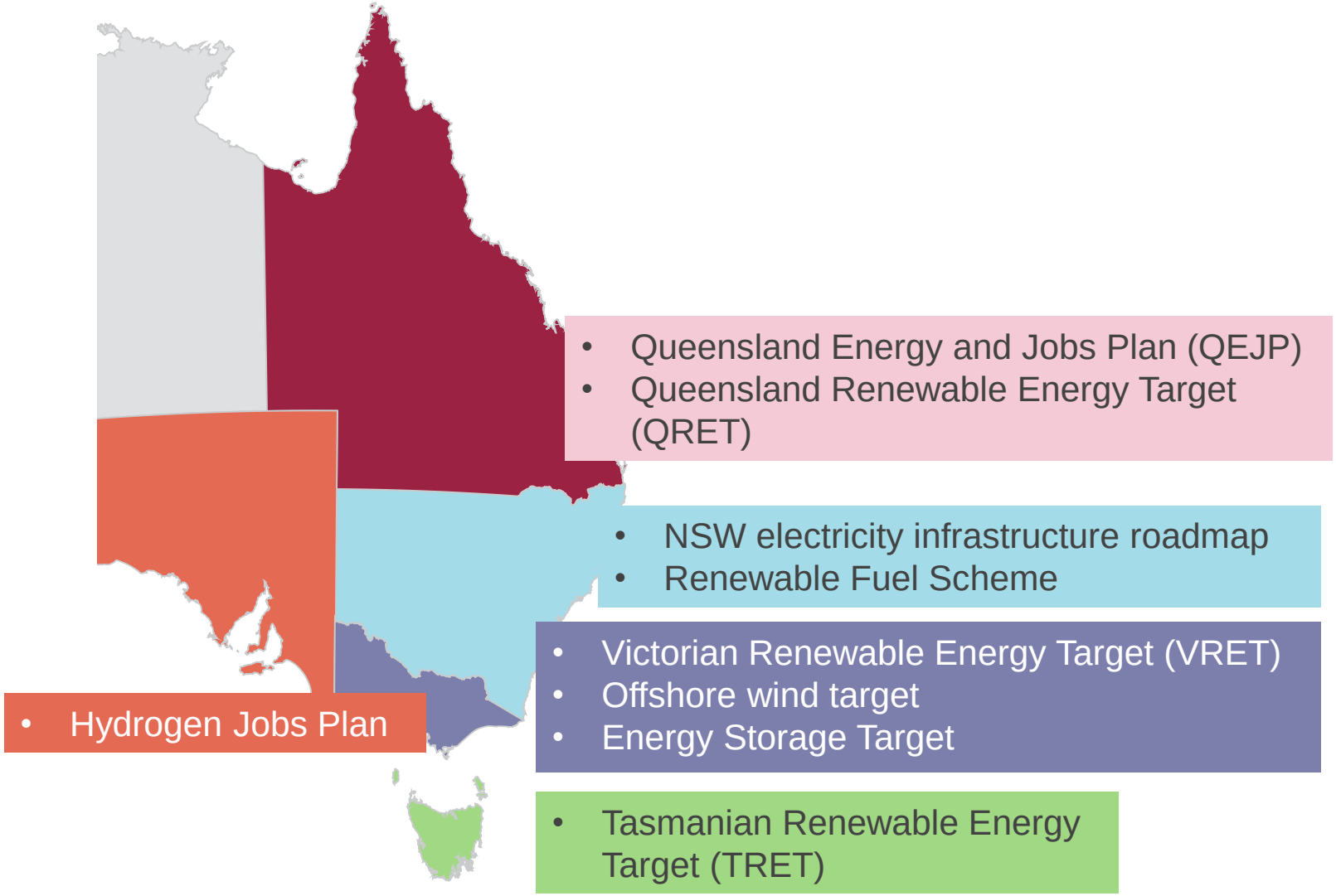


Sensitivities will be deployed to explore key assumptions

- In addition to the key sensitivities labelled previously, the following are key assumptions, the effect of which may be examined through sensitivity analysis:
  - supply chains
  - social licence
  - discount rates
  - investment impacts of specific policy and/or infrastructure developments, for example:
    - pumped hydro energy storage developments
    - offshore wind developments.

Policy inclusion

All scenarios include policies that meet the policy criteria of NER 5.22.3(b), which includes those that are **legislated**, or have **material funding** allocated in a jurisdictional budget. Additional emissions reduction policies will be included to meet the intent of the amended **National Energy Objectives**. Key policies considered include:



- Queensland Energy and Jobs Plan (QEJP)
- Queensland Renewable Energy Target (QRET)

- NSW electricity infrastructure roadmap
- Renewable Fuel Scheme

- Victorian Renewable Energy Target (VRET)
- Offshore wind target
- Energy Storage Target

- Hydrogen Jobs Plan

- Tasmanian Renewable Energy Target (TRET)

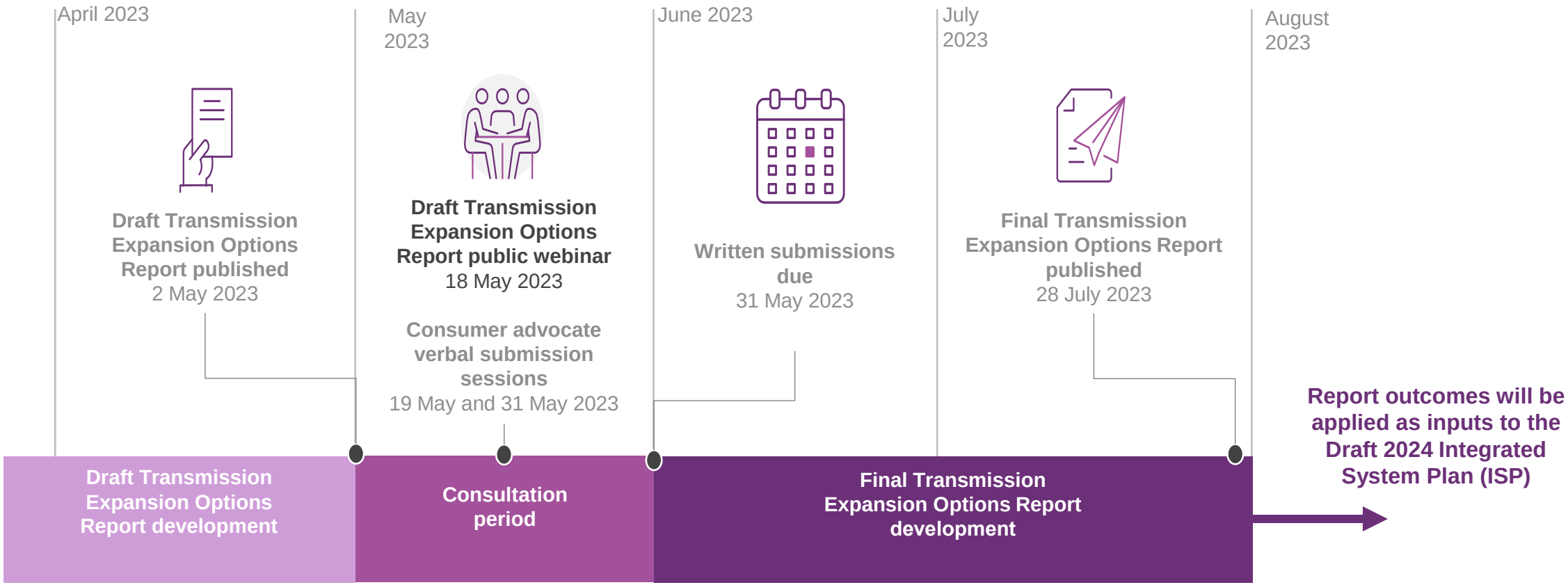
Commonwealth government policies

- Australia's current commitments to the Paris Agreement, as legislated through the Climate Change Act
  - 43% emissions reduction by 2030
  - Net zero by 2050
- Large Scale Renewable Energy Target (LRET)
- Safeguard Mechanism
- Rewiring the Nation

ISP update to Joint Planning Committee

Manager Strategic Planning, System Design, Samantha Christie

AEMO has received submissions on the Draft 2023 Transmission Expansion Options Report

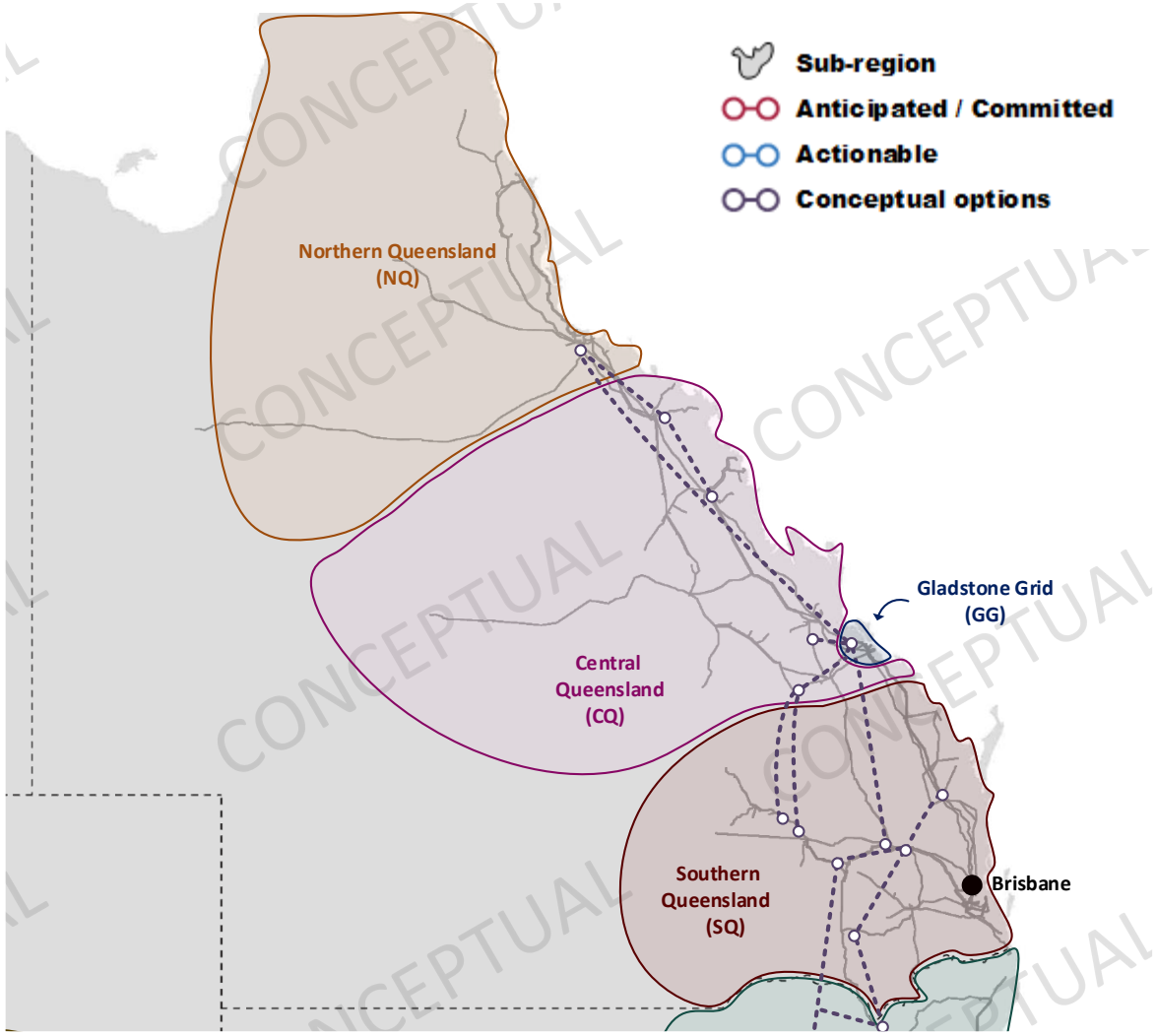


The draft report and its appendices are available here.

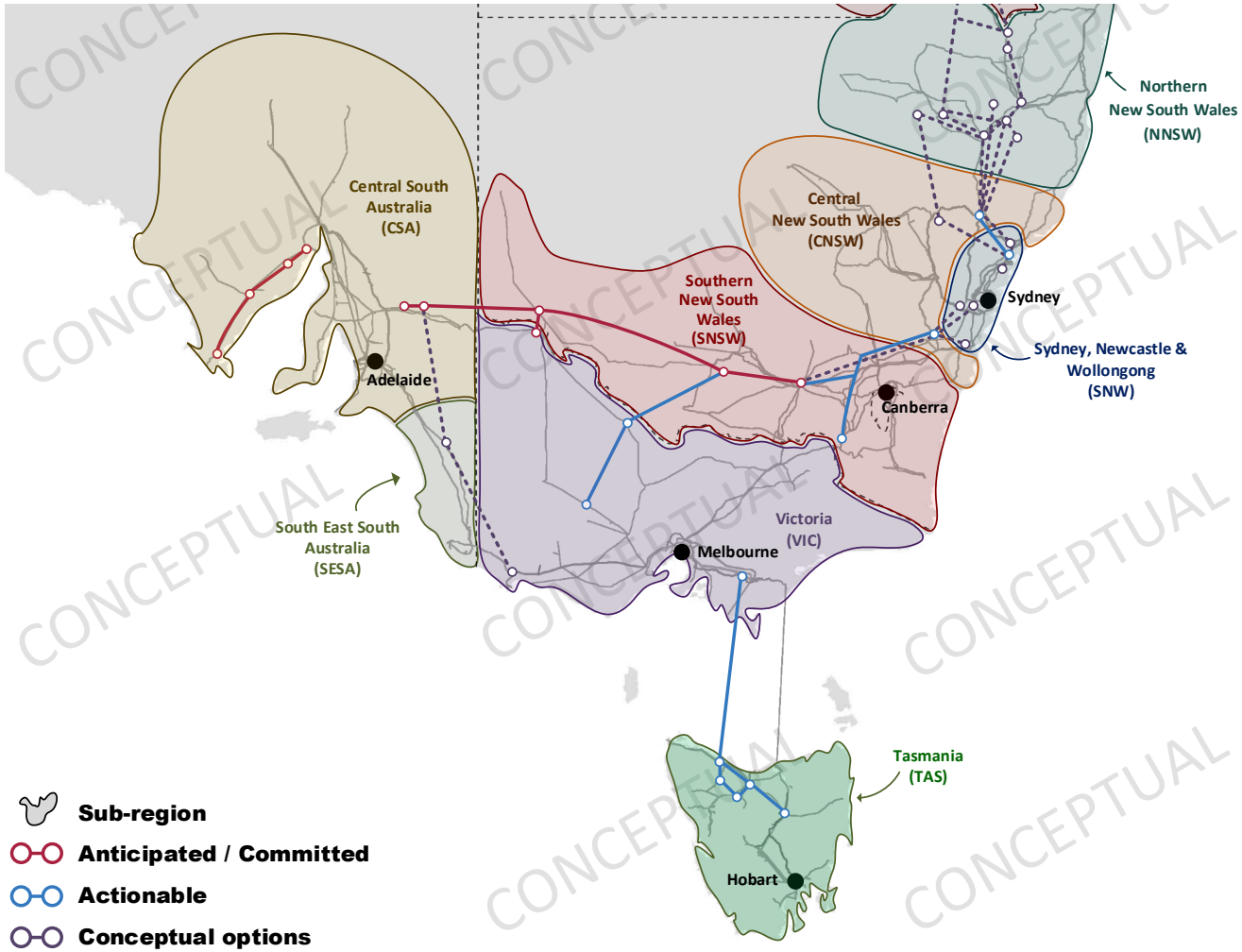
Flow paths for Queensland

Purpose of flow paths

- Transport significant amounts of electricity across the backbone of the network.



Flow paths for New South Wales, Victoria, South Australia and Tasmania



Purpose of flow paths

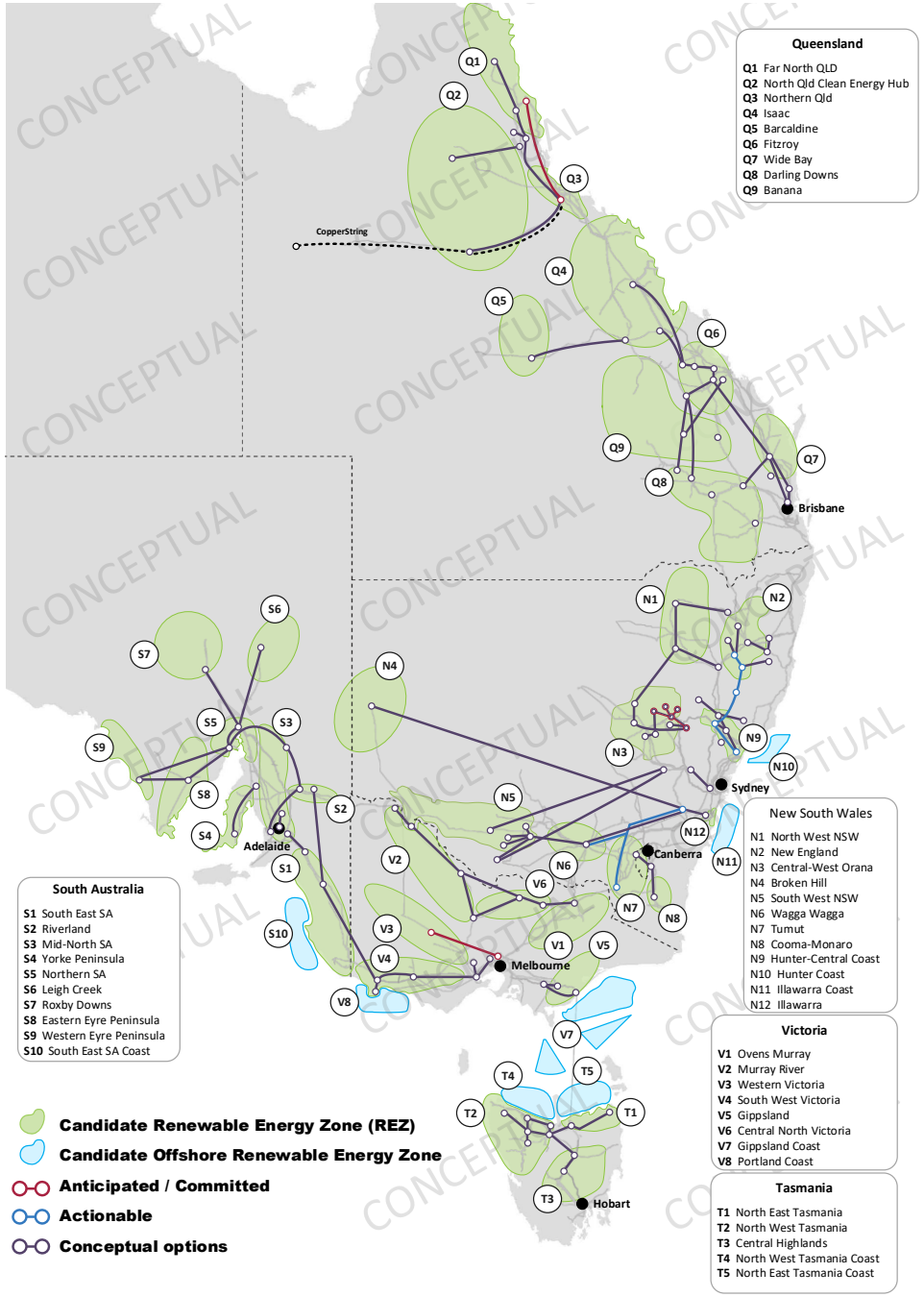
- Transport significant amounts of electricity across the backbone of the network.

REZs

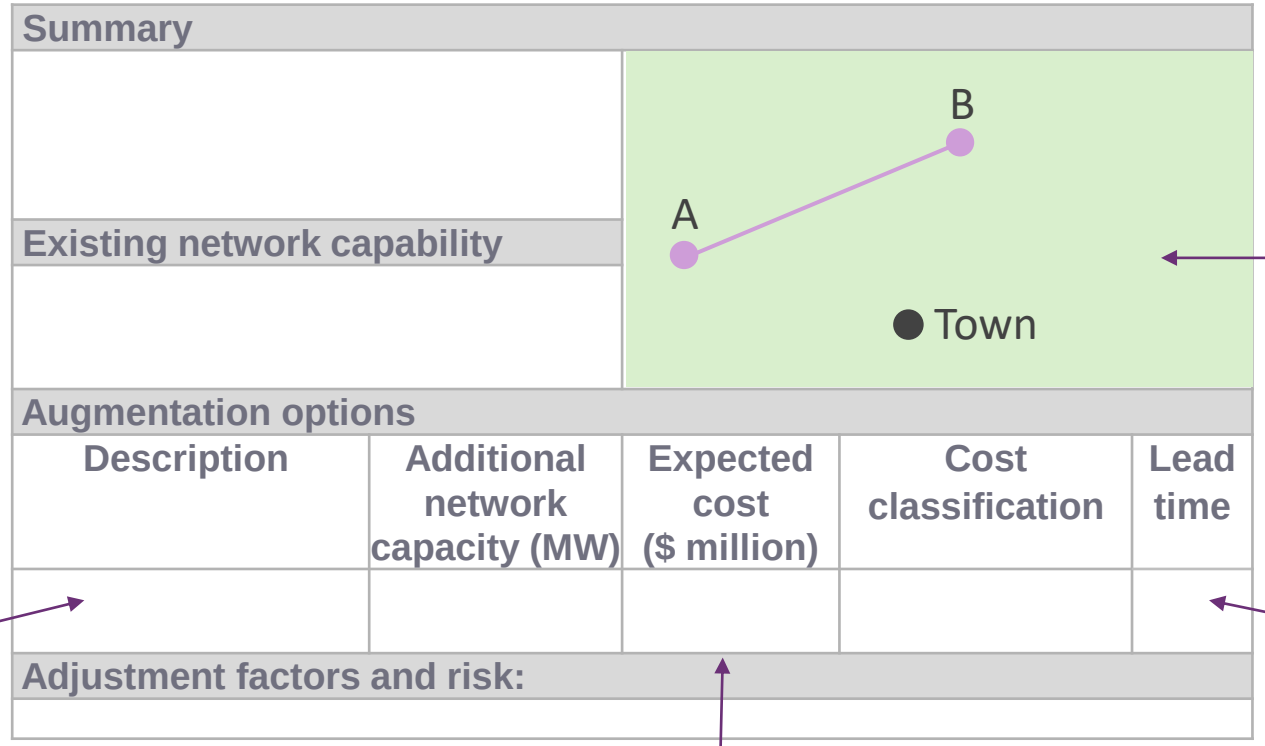
Purpose of REZ options

Connect renewable generation in areas where clusters of large-scale renewable energy can be developed using economies of scale.

Some of the options are designed to transfer power from more than one REZ through to a big load centre.



The methodology produces a 'report card' for each flow path and REZ, including augmentation options



Location
Conceptual location and path are shown on a localised map

Conceptual design is described

Lead time category

Cost estimate

Consumer advocates' verbal submission	Engie	ISP Consumer Panel	L Gervasoni	Lodestone Mines
Moyne Shire Council	Origin	Pacific Blue	Public Interest Advocacy Centre	RE-Alliance
Reach Solar Energy	Queensland Conservation Council	S Bartlett	Sligar and associates	Smart Wires
SnowyHydro	Star of the South	TasNetworks	Transgrid	Windlab
ZEN Energy	[2 x confidential]			

Submissions received

- 22 submissions received (two confidential). Following slides show general themes of submissions (not a comprehensive list).

Key feedback relating to consumer matters – *not a comprehensive list*

- **Consumer advocates' verbal submission** emphasised importance of clear communication, a database of transmission augmentation options, and public historical tracking of project cost estimates. Also noted a preference for distributional impacts on consumer affordability to be included in the ISP.
- **ISP Consumer Panel** expressed strong concern that transmission cost estimates and forecasts may be too low, and may not reflect potential global supply chain issues and inflation risks. The panel also asked for more information about a range of transmission cost estimation matters.
- **Moyne Shire Council** called for consideration of underground transmission lines and provided information based on their experience with integrating new renewable energy infrastructure in their area to date.
- **PIAC** called for additional synthesis of information, including reports about generation and storage options, and a distributed energy resources options report, if the ISP is to be a true 'whole of system' planning mechanism. PIAC supported updates in the report relating to lead-times, inverter-based resources and offshore connections. PIAC recommended including risk allowance adjustments for cost estimates, showing larger projects with larger divergences in cost estimates, and called for social licence matters to be included in the baseline model of the ISP rather than a sensitivity.
- **RE-Alliance** recommended AEMO progress development of specific, identified, cost components that are critical to developing social licence on social, environmental, cultural heritage and land-sector considerations, and recommended AEMO engage closely with social licence experts in the preparation of the ISP.
- **Lisa Gervasoni** called for more and earlier engagement with the on-the-ground impacts of options, and more landholder engagement.
- **Queensland Conservation Council** called for far more social licence consideration options, and for social licence to be treated as more intrinsic rather than a sensitivity. The council also requested more granular assessment of land impacts of potential projects, earlier in the development process.
- A variety of submissions touched on the need for 'smoothing' infrastructure build in the model, and bringing together the implications of the report in a system-wide view.

TRANSMISSION COMPANY VICTORIA

VNI West

Manager - VNI West Procurement & Delivery, Sam Magee

Transmission Company Victoria

- TCV is a new company created by AEMO Vic Planning (AVP).
- As AEMO is the system planner and will not physically construct or own the transmission lines, it established TCV to make sure that commitments made in the early planning stages are captured and honoured across the life of the project.
- TCV will play a big role in consulting with landholders, Traditional Owners and the community to understand local concerns as the project moves to the next stage – the work to refine the route.
- TCV will provide early project updates and will work with the community on this important transmission line.

Why does Victoria need new transmission?

- Until now Victorians have enjoyed a reliable supply of electricity that has mostly been sourced from coal fired power stations in Gippsland.
- As our coal-fired power stations retire - renewables will fill the supply gap.
- For renewables to work they will need to be built in the sunniest and windiest parts of the state. These are not the same places where existing coal fired generators are located.
- VNI West will deliver a more reliable and sustainable grid by increasing the flow of renewable energy by:
    - Collecting and sharing clean, low-cost renewable power from the wind and solar-rich Murray River and Western Victorian renewable energy zones (REZ)s .
    - Strengthen the connection between Victoria's and New South Wales' power grids, including access to renewable energy from the Snowy 2.0 hydro scheme.
    - Improve the security and reliability of the electricity network as coal-fired power stations are retired.

VNI West regulatory process complete

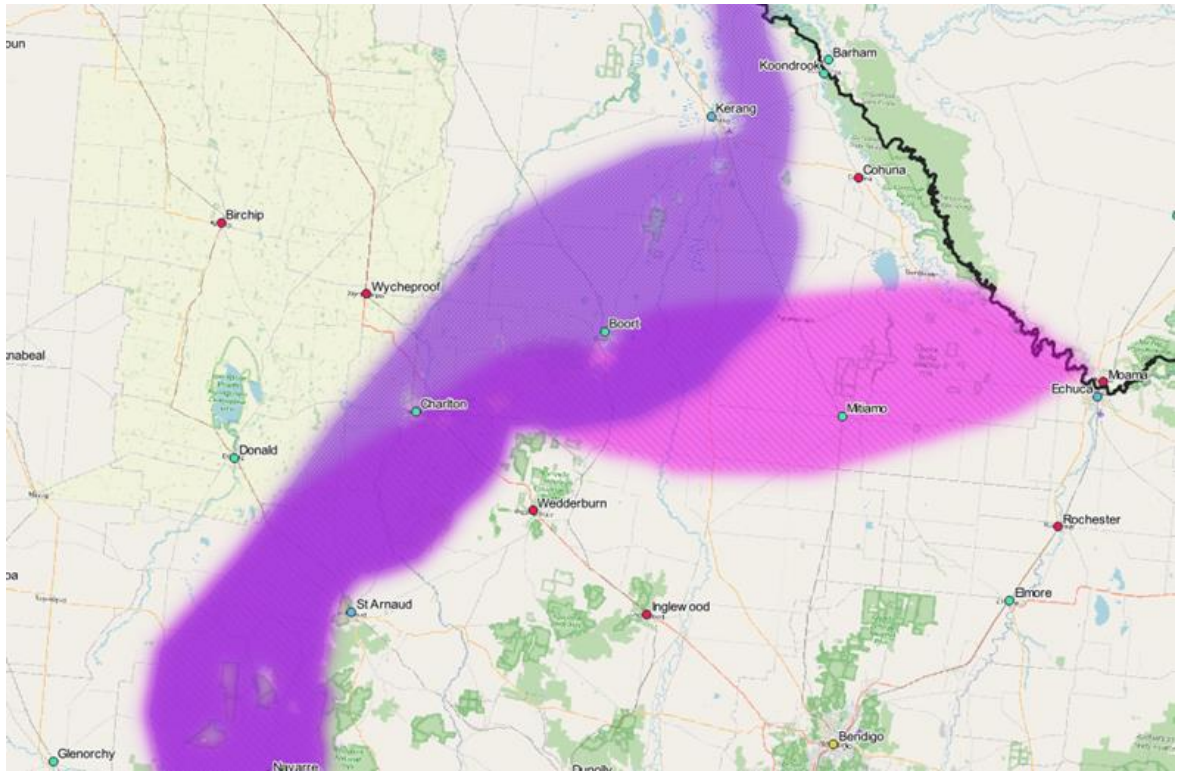
Date	Milestone
December 2019	**Project Specification Consultation Report (PSCR)** Seeks feedback on identified need for new transmission infrastructure and explores potential investment option to address this need.
July 2022	**Project Assessment Draft Report (PADR)** Identifies and seeks feedback (through written submissions) on the draft preferred option
May 2023	**Project Assessment Conclusions Report (PACR)** Informs on the final preferred option to deliver the highest net market benefits for consumers

Jul 2022	PADR published
Jul – Sep 2022	PADR consultation period
Dec 2022	Further assessment work on potential alternative connection points announced
20 Feb 2023	Victorian Government made orders under the National Electricity (Victoria) Act 2005 (NEVA)
23 Feb 2023	Additional pre-PACR consultation report published
23 Feb – 5 April 2023	Additional consultation period

27 May 2023	Victorian Government made orders under the National Electricity (Victoria) Act 2005 (NEVA)
27 May 2023	PACR published

VNI West preferred option – 5A

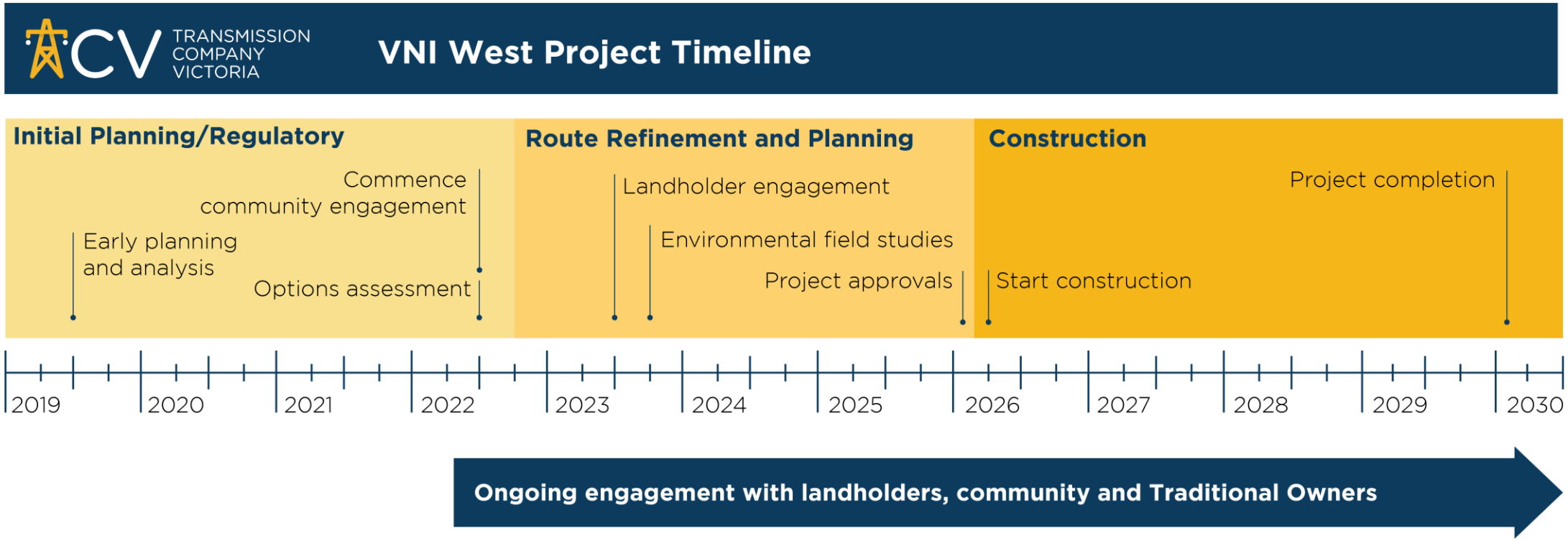
- Option 5 was the proposed preferred option that was put out for consultation in February
- A number of stakeholders raised concerns around:
  - the Murray River crossing point,
  - area of interest bypassing Gannawarra, as they were hoping to attract renewable generation development
- **Option 5A was developed in response to feedback**
- Both options (5 and 5A):
  - deliver $1.4 billion net market benefits for consumers
  - perform better than other options previously considered on land, planning and environment criteria, and differences between the two options are insignificant
  - connect to Western Renewables Link at Bulgana
- **Option 5A was selected as the preferred option as it:**
  - harnesses more renewable generation in the Murray River REZ (≈ 500MW higher REZ transmission limit)
  - has more support and therefore more likely to facilitate and expedite delivery.
- Option 5A is forecast to harness 3.4 GW of renewable generation capacity in Murray River and Western Victoria REZs



VNI West Ministerial Order

- The National Electricity (Victoria) Act 2005 (NEVA) is legislation that was passed in the Victorian Parliament in 2005 and includes powers for the Minister of Energy to support or facilitate delivery for transmission projects.
- In February 2023, the Victorian Government made orders to accelerate VNI West in recognition of the critical role it will play.
- The NEVA Order conferred upon AEMO Victorian Planning (AVP) functions which included the assessment of alternate options to the preferred options (for WRL and VNI West) to facilitate the development and delivery of those projects.
  - AVP was required to consult with VicGrid on draft outcomes of the assessment and in relation to the VNI West PACR
  - AVP must not enter into a VNI West construction agreement, or vary the WRL contract to implement an option other than the preferred option, without prior approval of the Minister, or another Ministerial Order
- In May 2023, the Victorian Minister for Energy and Resources announced a Ministerial Order to identify the preferred option for the Victorian part of VNI West and progress work to identify a final route through consultation with landowners, Traditional Owners and community stakeholders.

Timeline



The above dates are indicative only and subject to change

Next steps

TRANSMISSION COMPANY VICTORIA

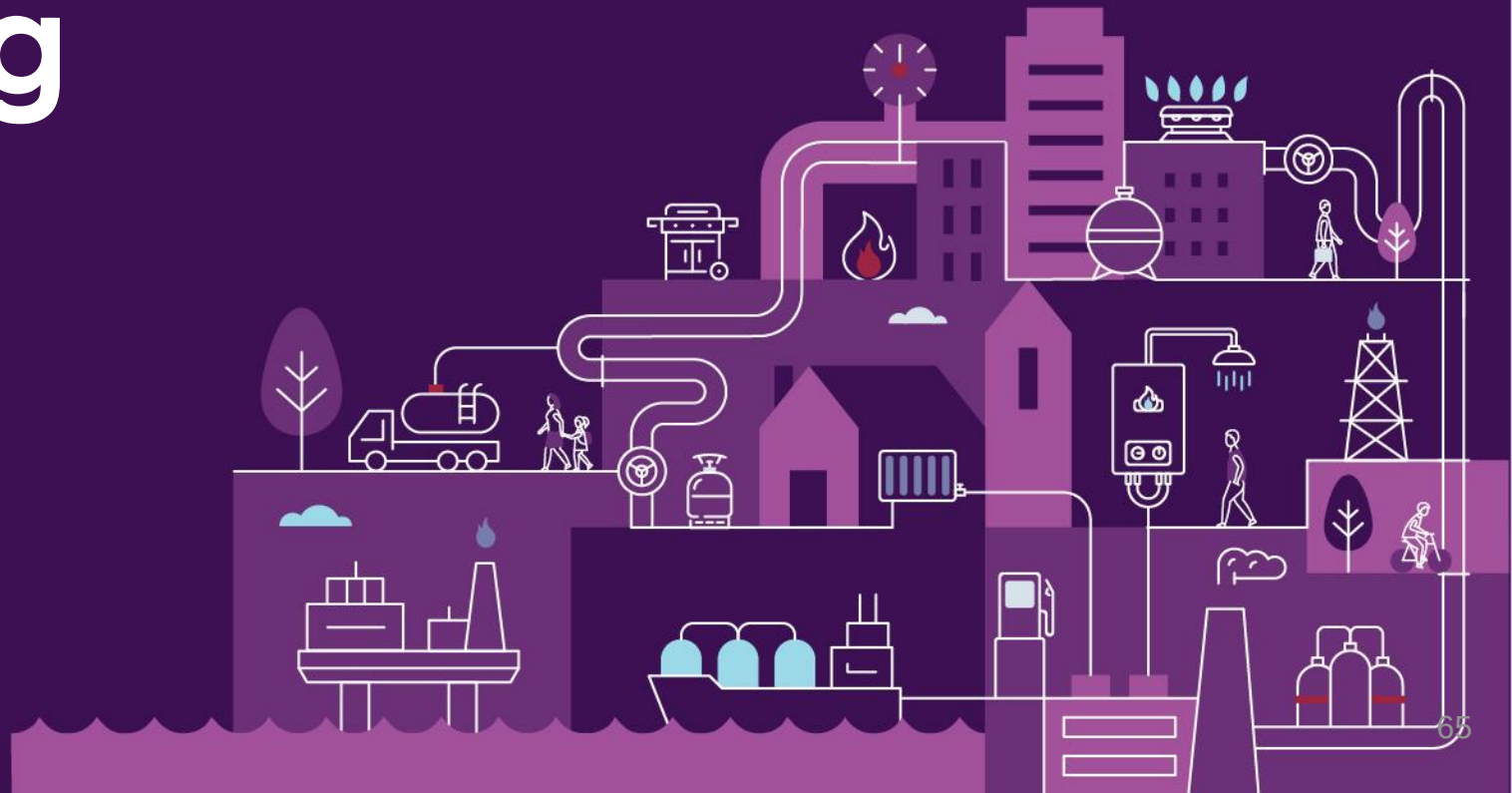
Route Options Assessment and ongoing **Regional Benefit Sharing** discussions

Landholder negotiation for access

Spring surveys

Detailed engagement with landholders, local communities, Traditional Owners and stakeholders to narrow corridor as quickly as possible and discuss regional benefit sharing opportunities

Next meeting



Potential agenda items

- FY24 Corporate Plan
- Stakeholder survey results
- NEM Reform update
- NEM Reform Participant Fee Consultation update
- IASR update
- 2023 ESOO publication
- Market event explanation
- Wholesale Demand Response Mechanism update