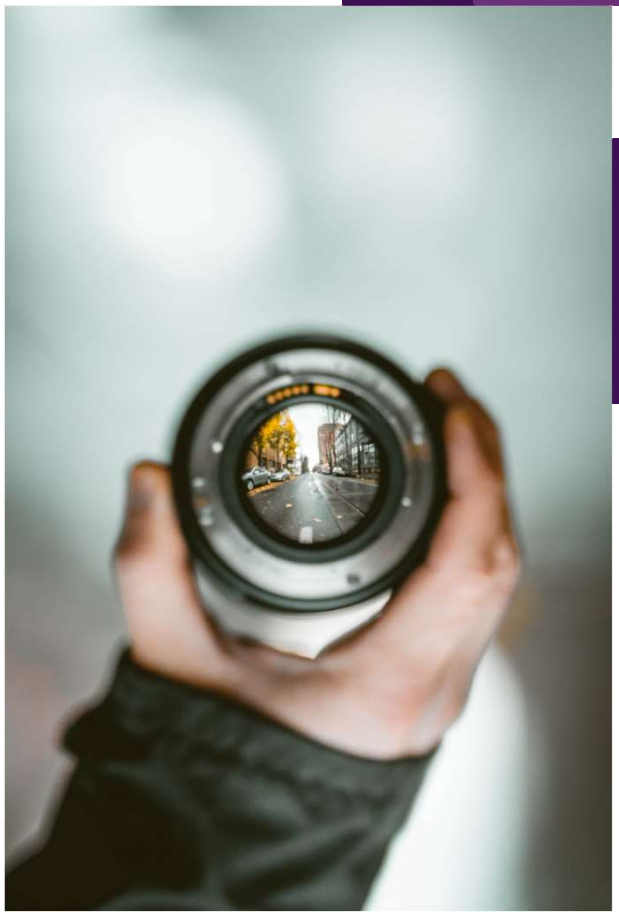
2024 AEMO Winter Gas Outlook

8 May 2024

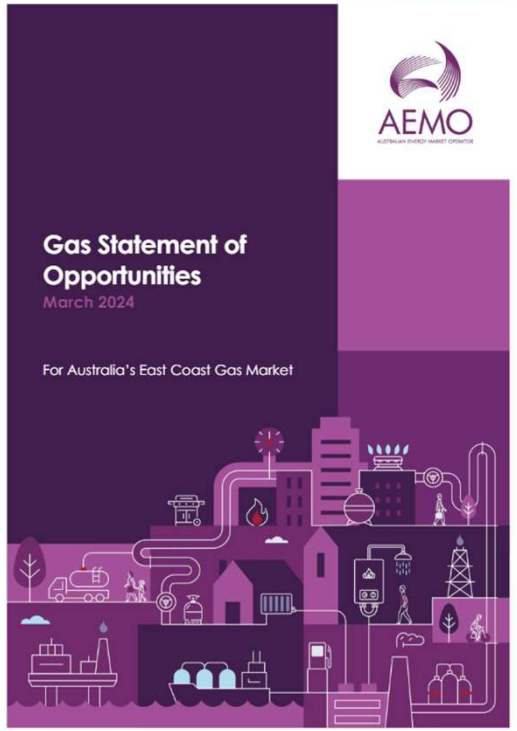
Winter 2024 focus

- Monitoring East Coast Gas System supply including supply from Queensland and storage inventories (Iona, Newcastle and Dandenong)
- Managing Longford production / outage risk particularly following the retirement of Gas Plant 1
- Coal generation outages – particularly increased outages occurring in Victoria
- Demand uncertainty – very low Victorian gas consumption during 2023



2024 GSOO summary

- There remains a risk of peak day shortfalls under extreme demand conditions for NSW, Victoria and Tasmania.
- Small seasonal supply gaps are forecast to emerge from 2026 under sustained high gas demand conditions, one year earlier than forecast in the 2023 GSOO.
- These may be delayed by the development of uncertain supply sources, increased pipeline capacity, or an LNG import terminal.
- A major annual supply gap is forecasted from 2028 driven primarily by Longford production decline.
- A combination of supply developments are needed to maintain supply adequacy.



Housekeeping items

- Questions can be raised during presentations using Slido (for both in person and online attendees)
- We will review these at the end of each presentation
- Participants can join at **slido.com** with **#AEMOWinter2024**
- A roaming microphone will also be made available for in person questions at the end of each presentation

2023 Winter in Review

East Coast Gas Overview

MAY 2024

Agenda

1. Overview
2. Demand
3. Supply
4. Markets

Overview

- Domestic gas consumption reduced in aggregate across all categories
- Winter 2023 saw record or near-record high average temperatures across the east coast
- Seasonal southern flows from Queensland were the highest in 3 years
- Iona storage inventory maintained at higher levels
- GSH and DAA volumes continued to increase

Demand

- System Demand
- Gas Powered Generation
- Weather

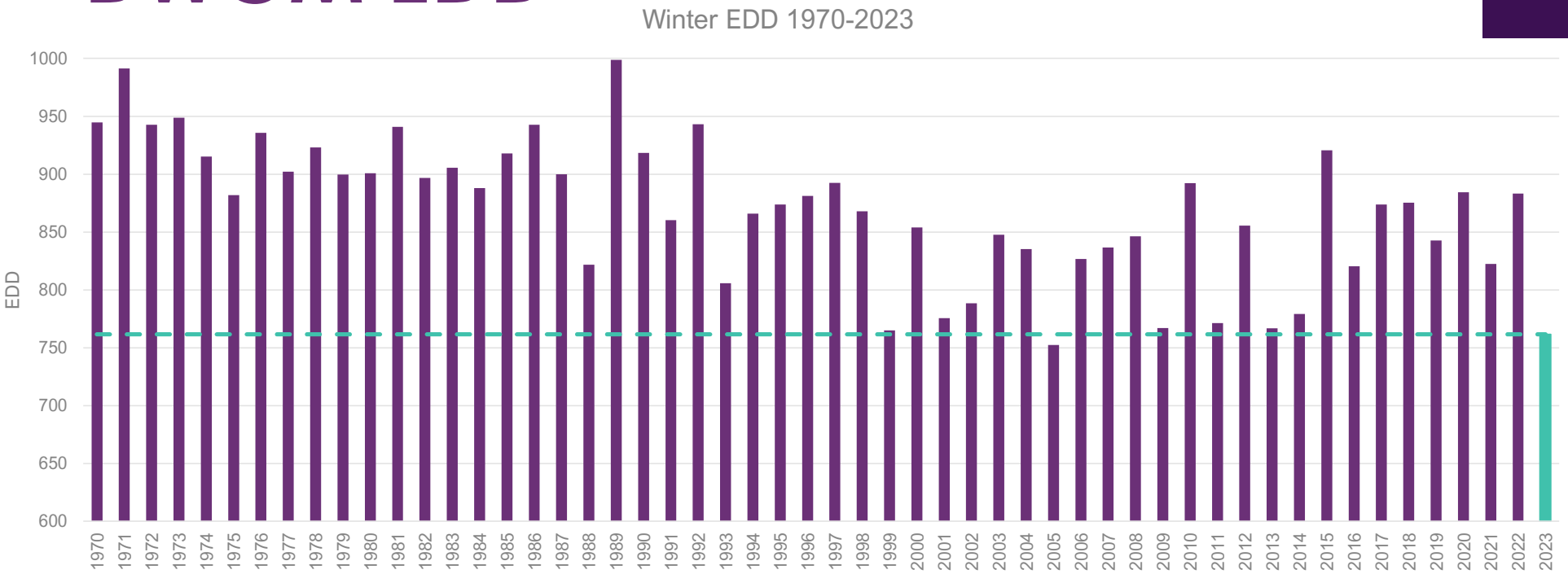
System demand

Demand Region	Winter System Demand (PJ)			Max Demand (TJ)	HDD and EDD		
	2023	2022	Move	2023	2023	2022	Move
Brisbane STTM	4.5	7.8	42% ▼	61	176	295	40% ▼
Sydney STTM	24.3	26.0	7% ▼	313	452	522	13% ▼
Victoria DWGM	66.5	78.1	15% ▼	980	762	883	14% ▼
Adelaide STTM	5.9	6.3	- -	80	539	571	12% ▼
Domestic Market Total	101.2	118.2	14% ▼				
QLD LNG	330.1	308.1	7% ▲	3,913			

- Brisbane demand lower mostly due to shutdown of Incitec Pivot's Gibson Island facility in January 2023
- Adelaide experienced its warmest winter on record, with Brisbane, Canberra and Sydney second warmest on record, and Melbourne equal 3rd warmest on record (based on mean temperatures)*
- First time the highest daily DWGM system demand has not exceeded 1,000 TJ at least once during a winter since DWGM began (1999)
- QLD LNG demand higher due to increases from APLNG and QCLNG

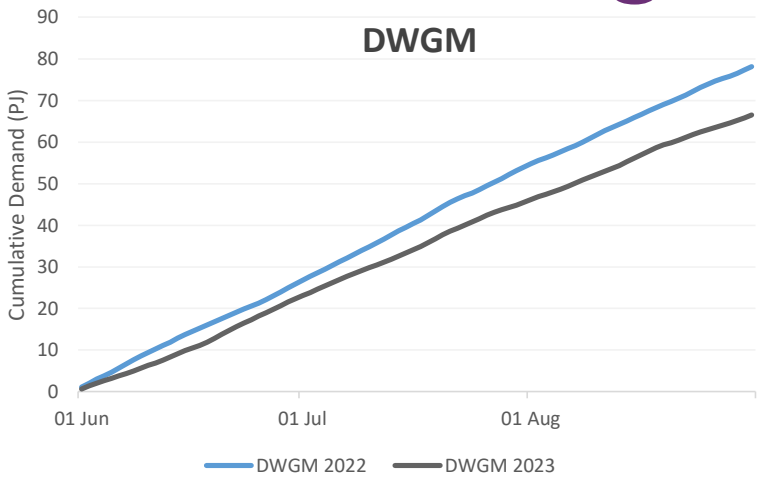
* Source - https://www.abc.net.au/news/2023-08-31/nsw-winter-warmth-weather-spring-scorcher/102796106

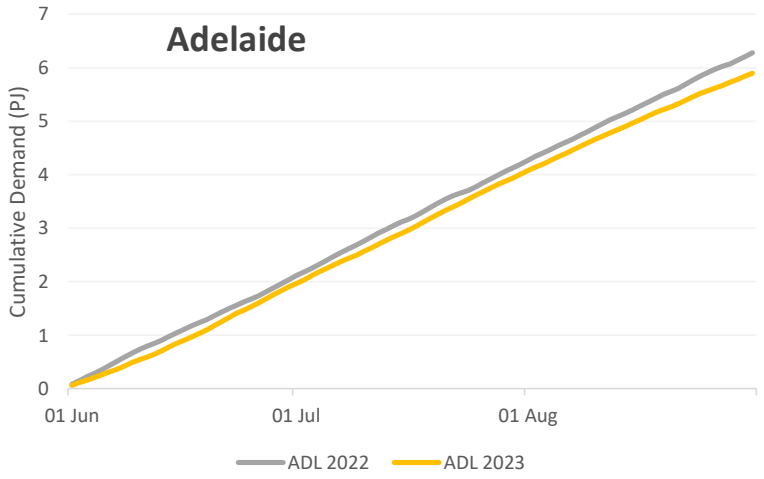
DWGM EDD

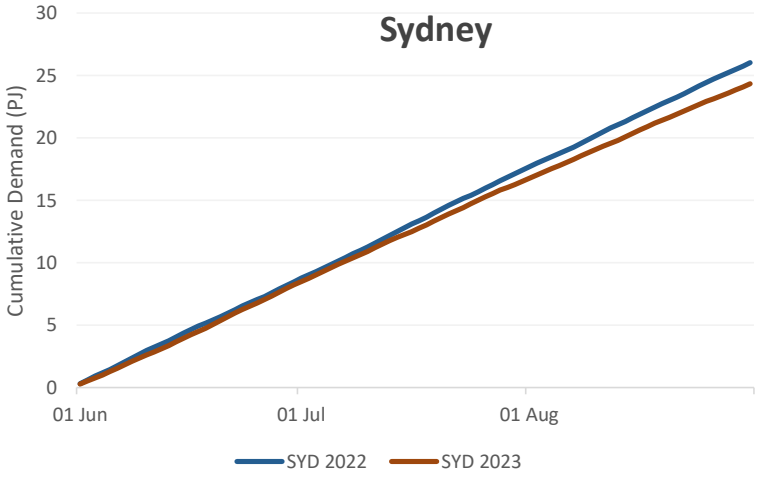


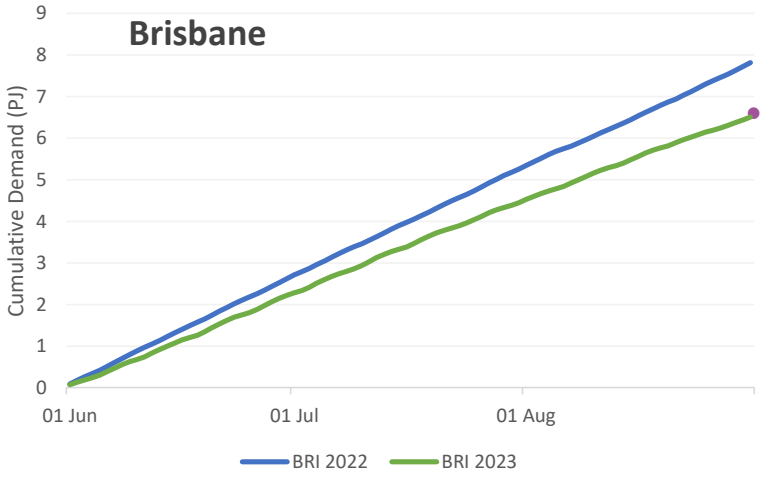
- Lowest Winter EDD aggregate since 2005
- Melbourne recorded its equal 3rd warmest mean winter temperature on record
- EDD aggregate has been trending downwards since the 1970s and 1980s

Contrasting markets





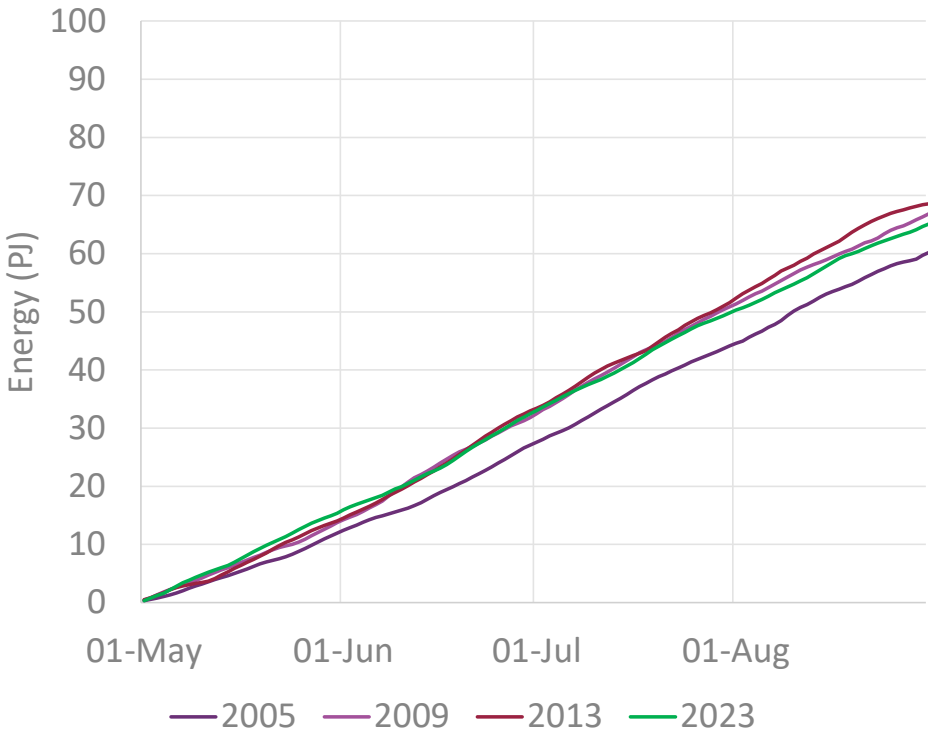




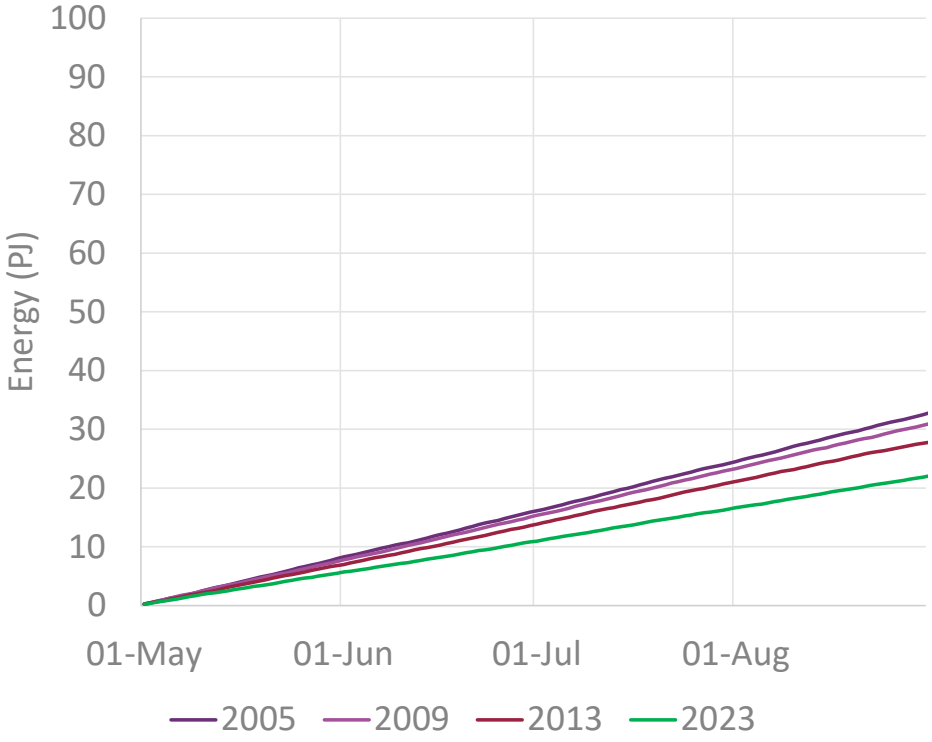
- Milder weather is the biggest contributor to lower demand in DWGM, Adelaide and Sydney
- Tariff D demand is also lower in Victoria
- Brisbane demand lower due to shutdown of Incitec Pivot's Gibson Island facility in January 2023

DWGM winter consumption

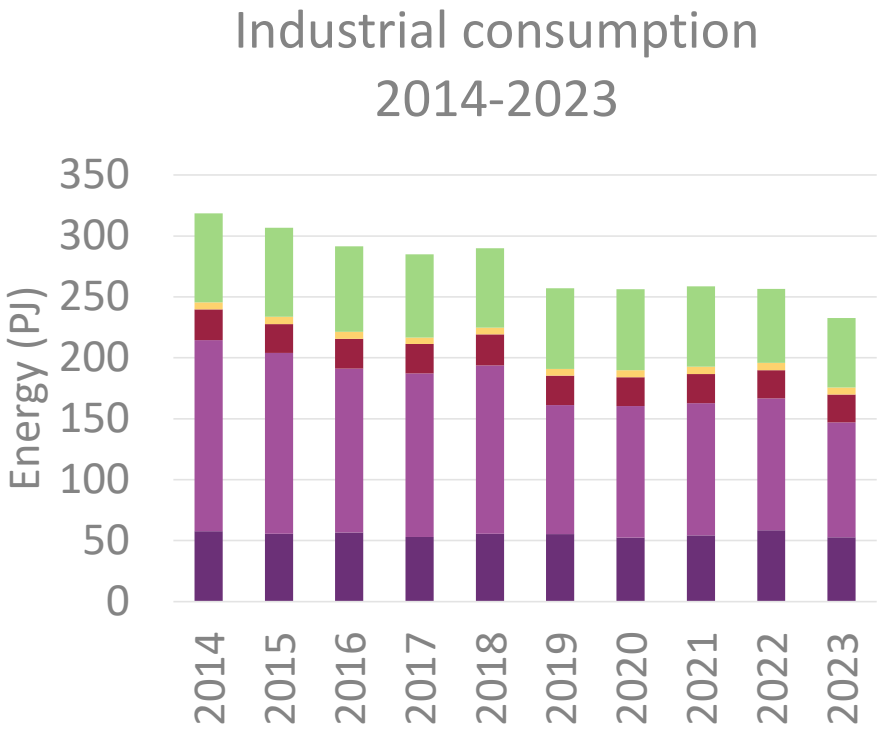
Residential & small commercial cumulative consumption - 2023 and previous 3 lowest EDD winters

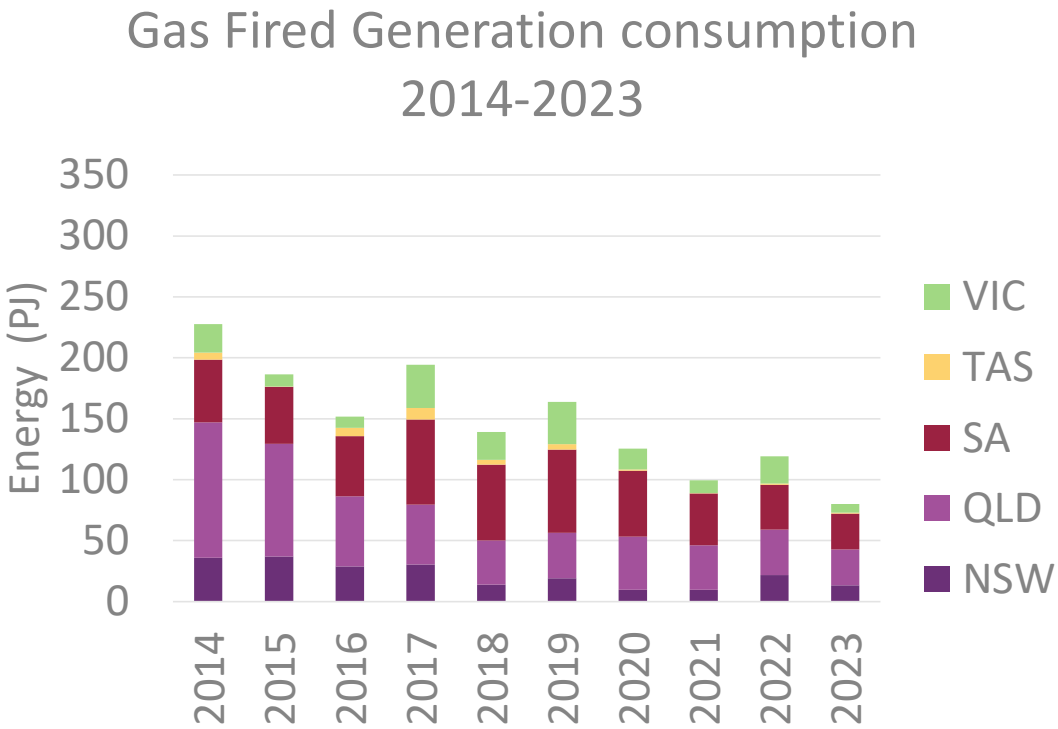


Industrial cumulative consumption - 2023 and previous 3 lowest EDD winters



Industrial and GPG consumption





Gas powered generation (GPG)

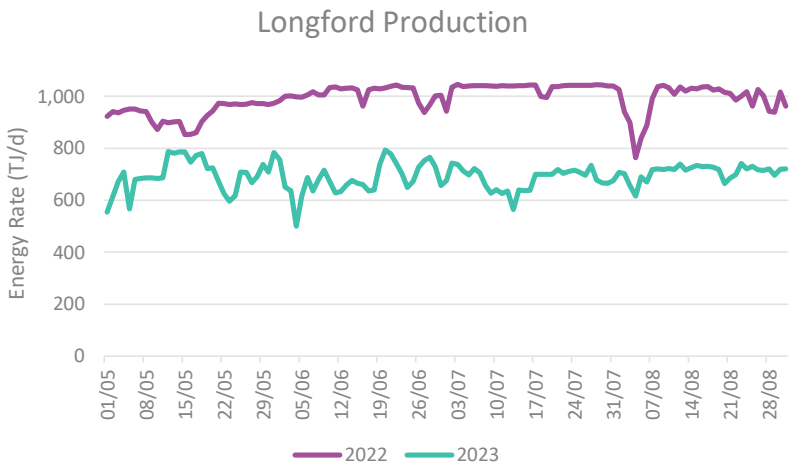
Demand Region	Total State GPG (PJ)			DWGM/STTM GPG (PJ)		
	Winter 2023	Winter 2022	Move	Winter 2023	Winter 2022	Move
QLD	10.8	14.8	27% ▼	2.0	0	- ▲
NSW	3.8	9.0	58% ▼	-	-	-
VIC	2.3	9.2	75% ▼	1.1	5.5	37% ▼
SA	9.2	12.8	28% ▼	-	-	-
TAS	0.2	0.2	2% ▼	-	-	-
∑GPG	26.2	45.9	43% ▼	3.1	5.5	44% ▼

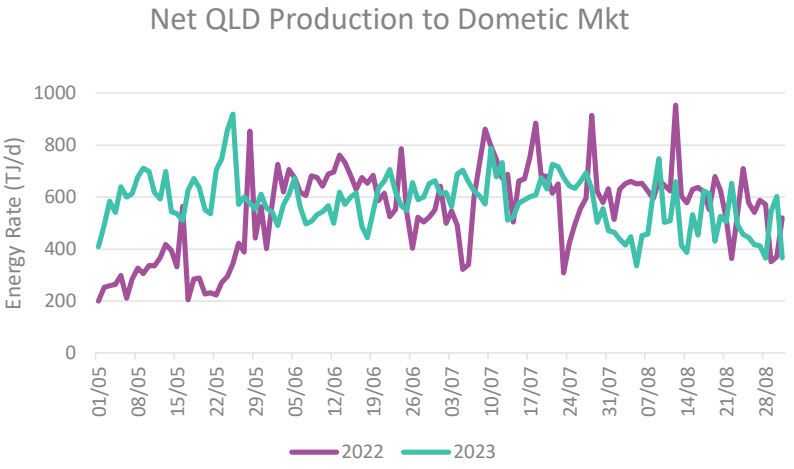
- GPG lower in all regions due to a combination of lower NEM demand and baseload generation
- Notable changes: QLD – Swanbank E (+1.9 PJ), Darling Downs (-2.2 PJ), NSW – Tallawarra (-1.6 PJ), Colongra (-2.8 PJ) SA – TIPS (-2.5 PJ), Osborne (-1 PJ), VIC – Laverton (-1 PJ), Mortlake (-2.5 PJ), Newport (-2.1 PJ)

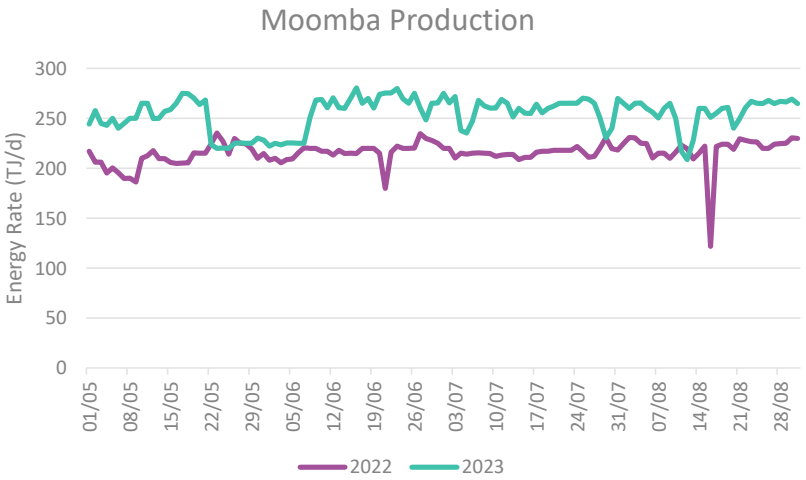
Supply

- Production
- Storage
- Pipeline flows

Production



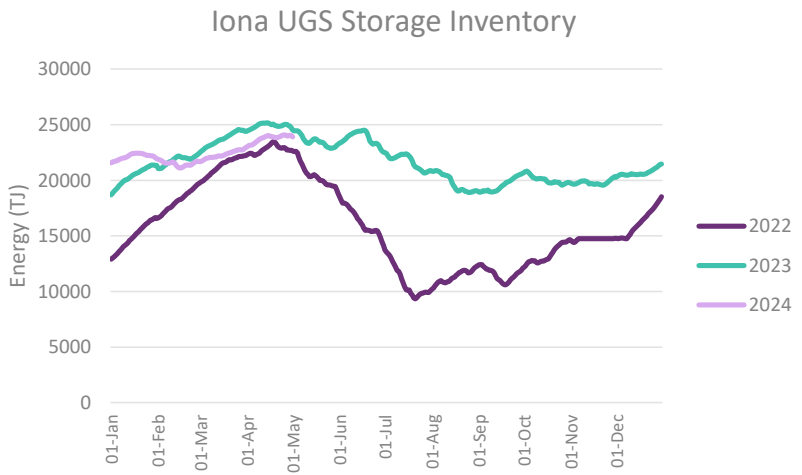


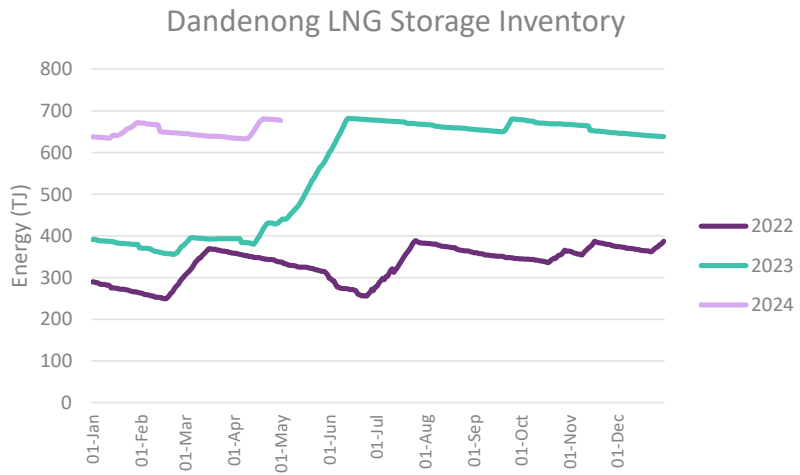


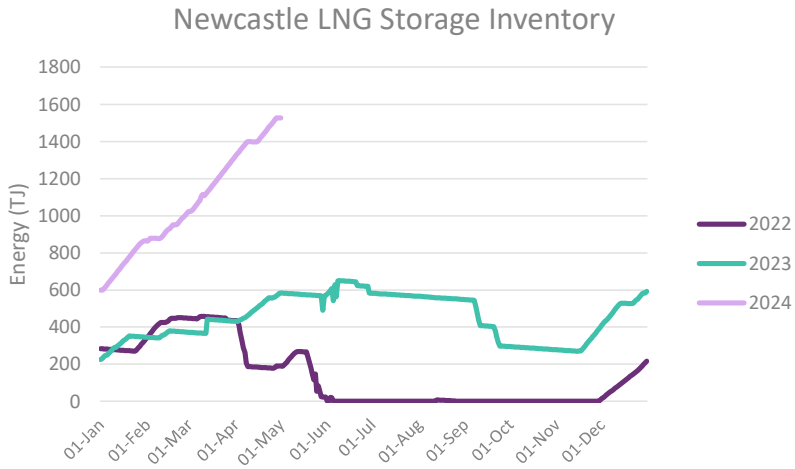
1 June – 31 August 2022 vs 2023:
Longford production lower (-29.5 PJ)
Otway production lower overall, large variability (-3.9 PJ)
Bass Gas slightly higher (+0.2 PJ)
Orbost production slightly higher (+0.1 PJ)
Moomba production higher (+3.7 PJ)
Net QLD production to domestic market lower (-0.4 PJ)
Northern Territory supply to QLD lower (-0.4 PJ)

*GBB data

Storage







- Iona storage inventory higher, sustained filling in June
- DLNG inventory increased with LNG Reserve (DWGM rule change)
- DLNG and NGS not utilised for supply during winter 2023

Pipeline flows

QLD – Increase in SWQP flows towards Moomba and Mt Isa, despite lower demand in southern markets. Large increase in flows to Curtis Island

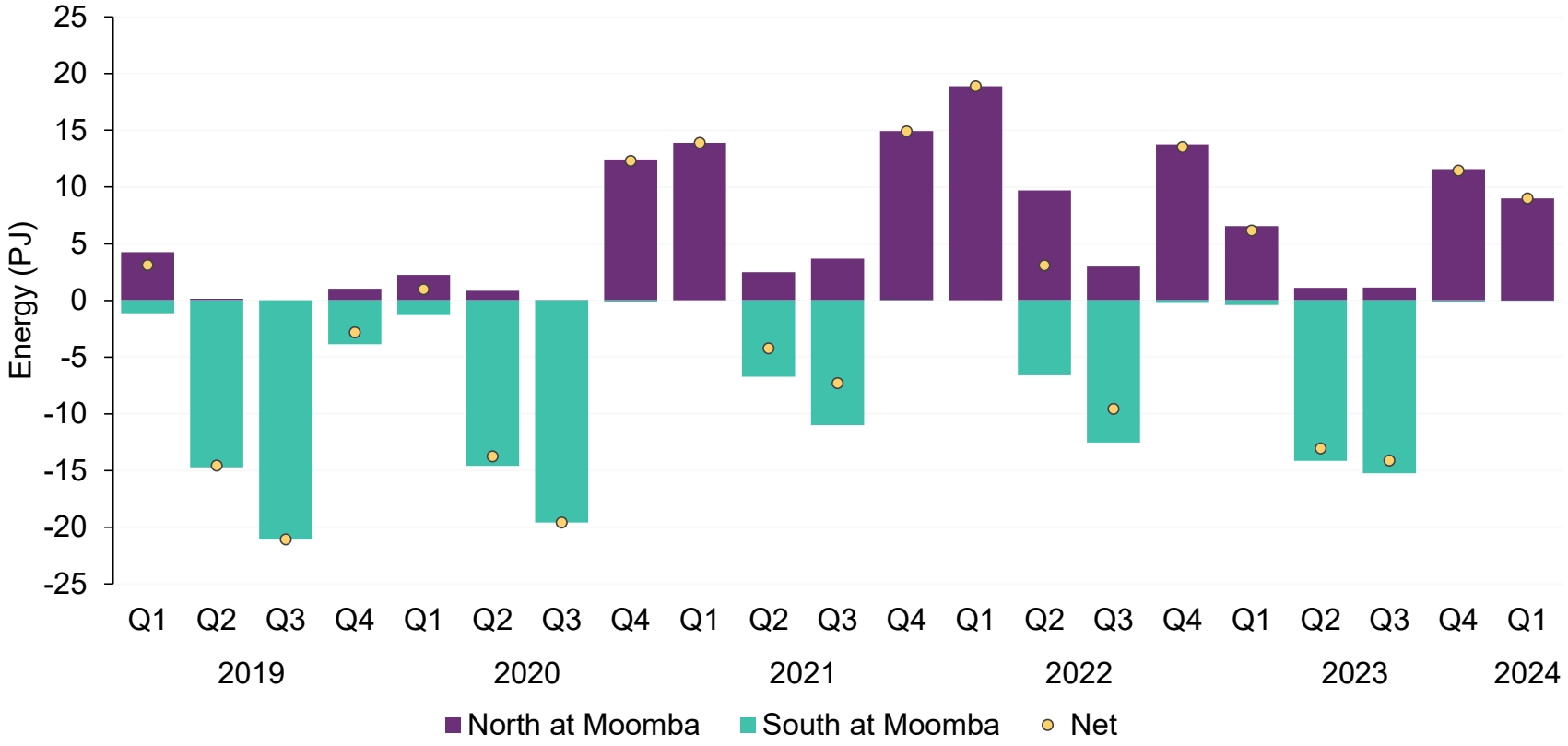
NT – Slightly lower NGP flows to Mt Isa, resulting in increased CGP flows

SA – Decreases on MAP and SEA Gas reflective of lower demand

NSW – Increase in MSP flows with a large decrease in EGP flows, reflective of lower Longford production and increase in QLD supply

VIC – Large decrease in Longford-Melbourne flows reflective of lower Longford production. Imports via Culcairn with more QLD supply

SQWP flows


25
20
15
10
5
0
-5
-10
-15
-20
-25
Energy (PJ)
Q1 Q2 Q3 Q4 Q1 Q2 Q3 Q4 Q1 Q2 Q3 Q4 Q1 Q2 Q3 Q4 Q1 Q2 Q3 Q4 Q1
2019
2020
2021
2022
2023
2024
North at Moomba
South at Moomba
Net

Markets

- Gas market prices
- Gas Supply Hub
- Day Ahead Auction

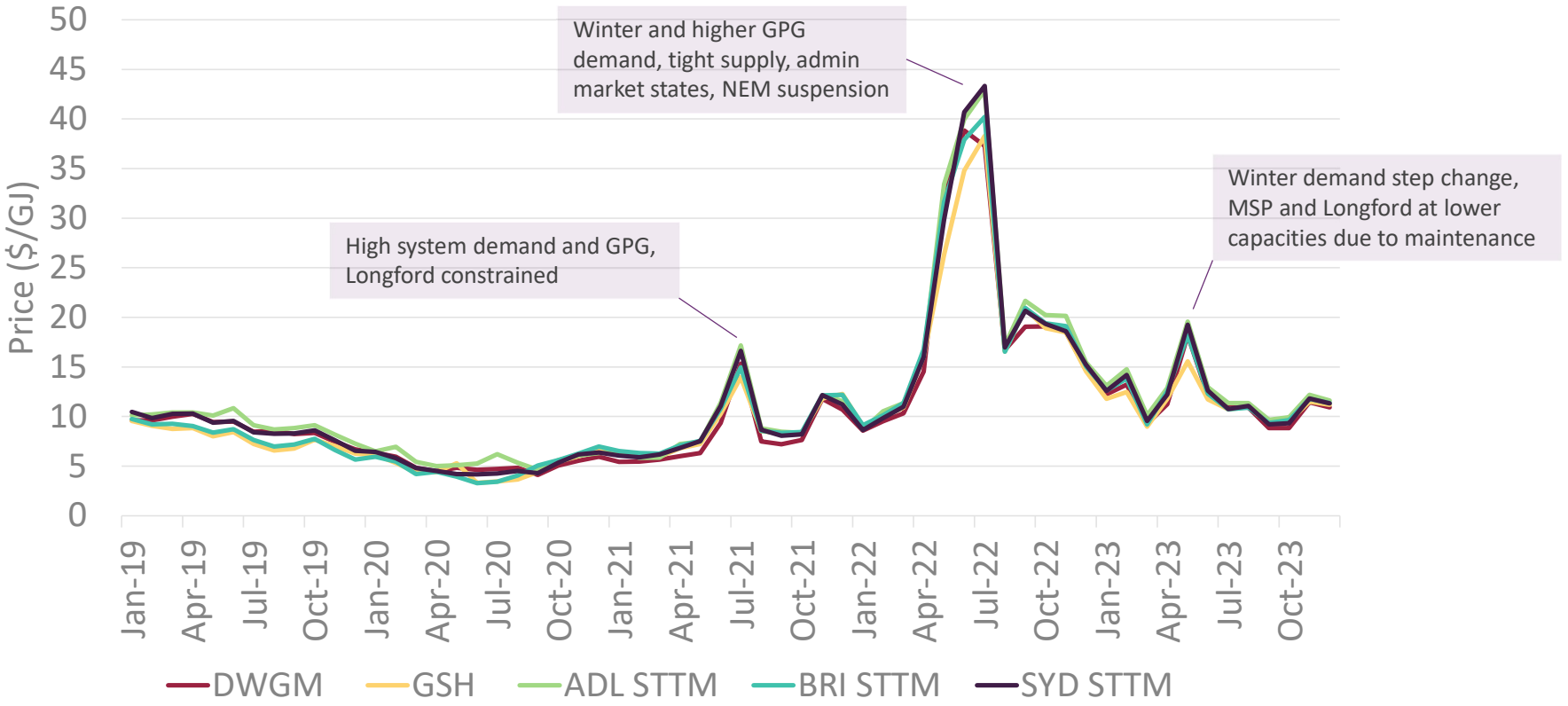
Gas market prices

	Average Price ($/GJ)		Movement
	Winter 2023	Winter 2022	
DWGM	11.23	30.86	63% ▼
ADL STTM	11.88	33.27	64% ▼
SYD STTM	11.48	33.59	66% ▼
BRI STTM	11.30	31.49	64% ▼
GSH	11.14	29.78	63% ▼

- Large decrease in prices across all markets compared to winter 2022
- Milder weather and lower demand across all sectors a significant driver of lower prices

Gas market prices

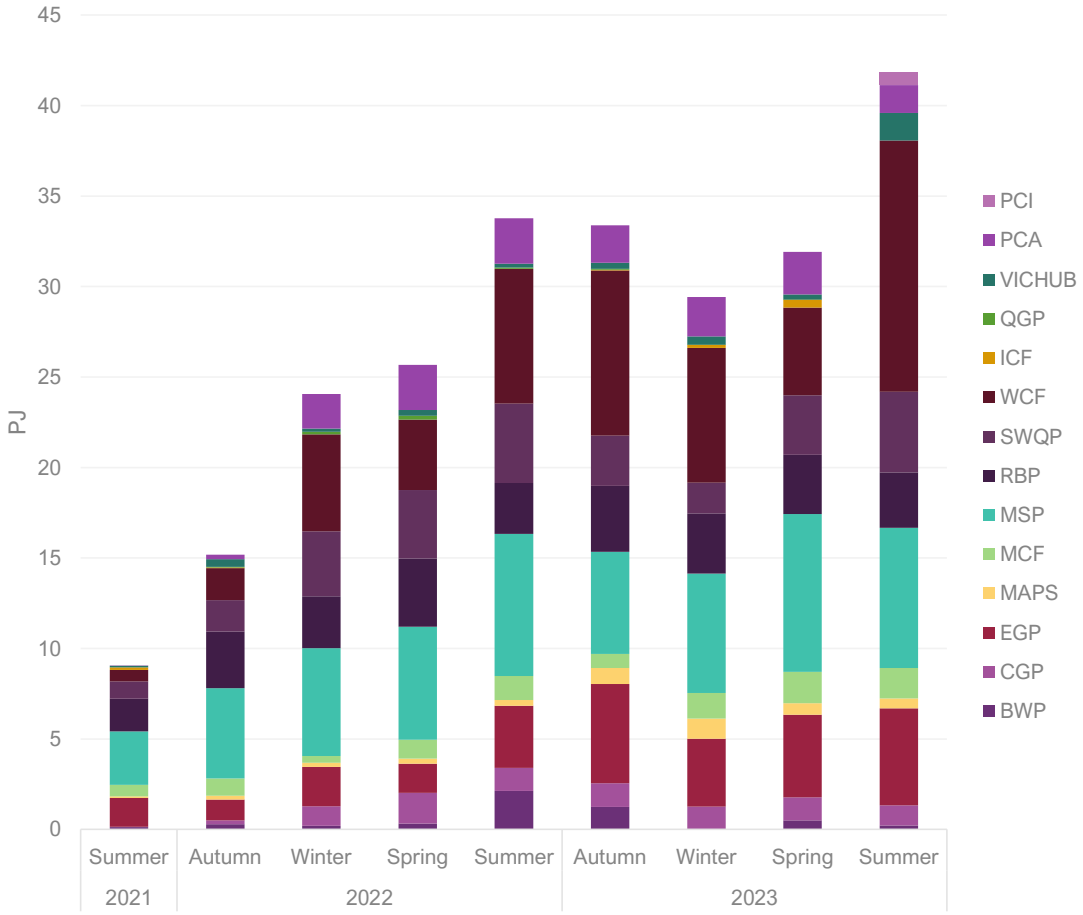
East coast wholesale market prices (monthly average)
2019-2023



Gas Supply Hub

- GSH traded volumes lower than winter 2022
- 10.9 PJ was traded, with 9.7 PJ delivered

Day Ahead Auction

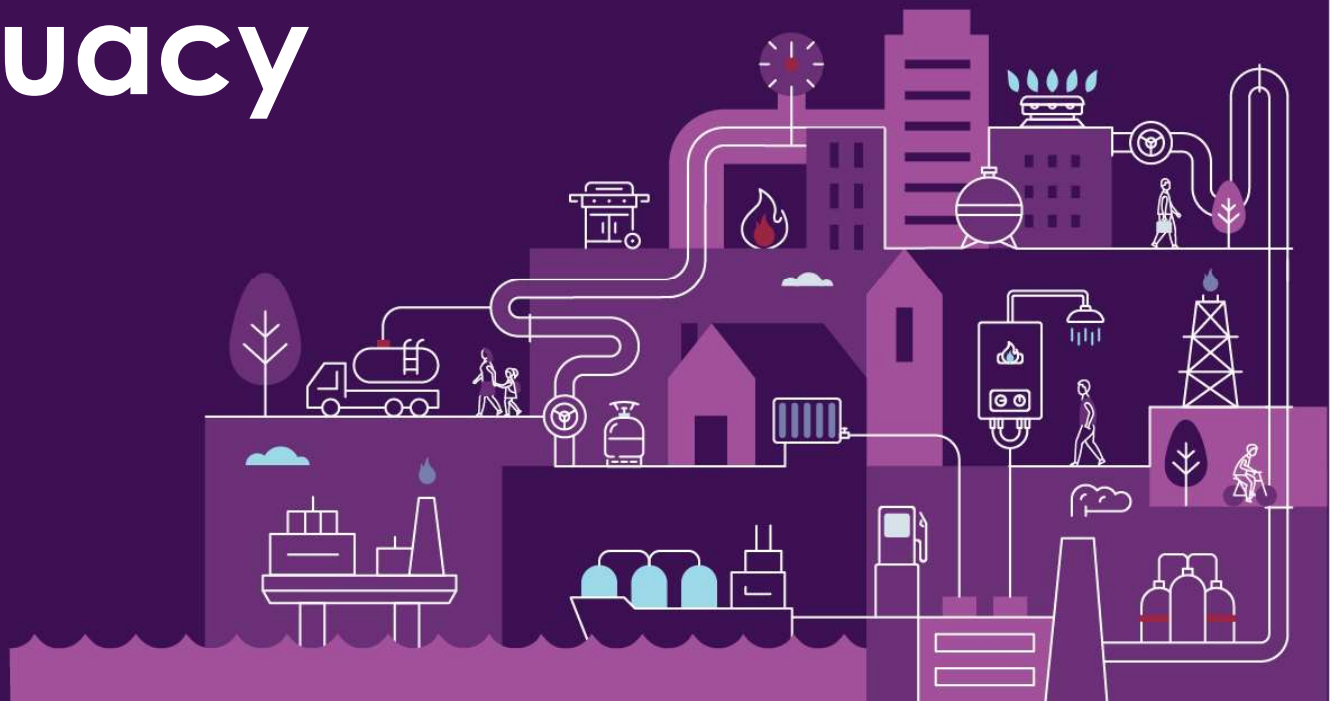


- Record auction volumes
- Increase driven mainly by large increases on WCF, EGP, Vichub
- Average auction clearing prices remain at zero or close to zero on all pipelines

2023 winter review summary

- Lower demand
- Lower production in southern states
- No significant market events
- Increased south-bound flows to Moomba from Queensland
- Relatively low utilisation of storage
- Some elevated prices early, but overall, substantially reduced from the previous year

Supply adequacy



Agenda

1. Demand forecasts
2. Projects in 2024
3. Winter 2024 adequacy
4. Longer term adequacy

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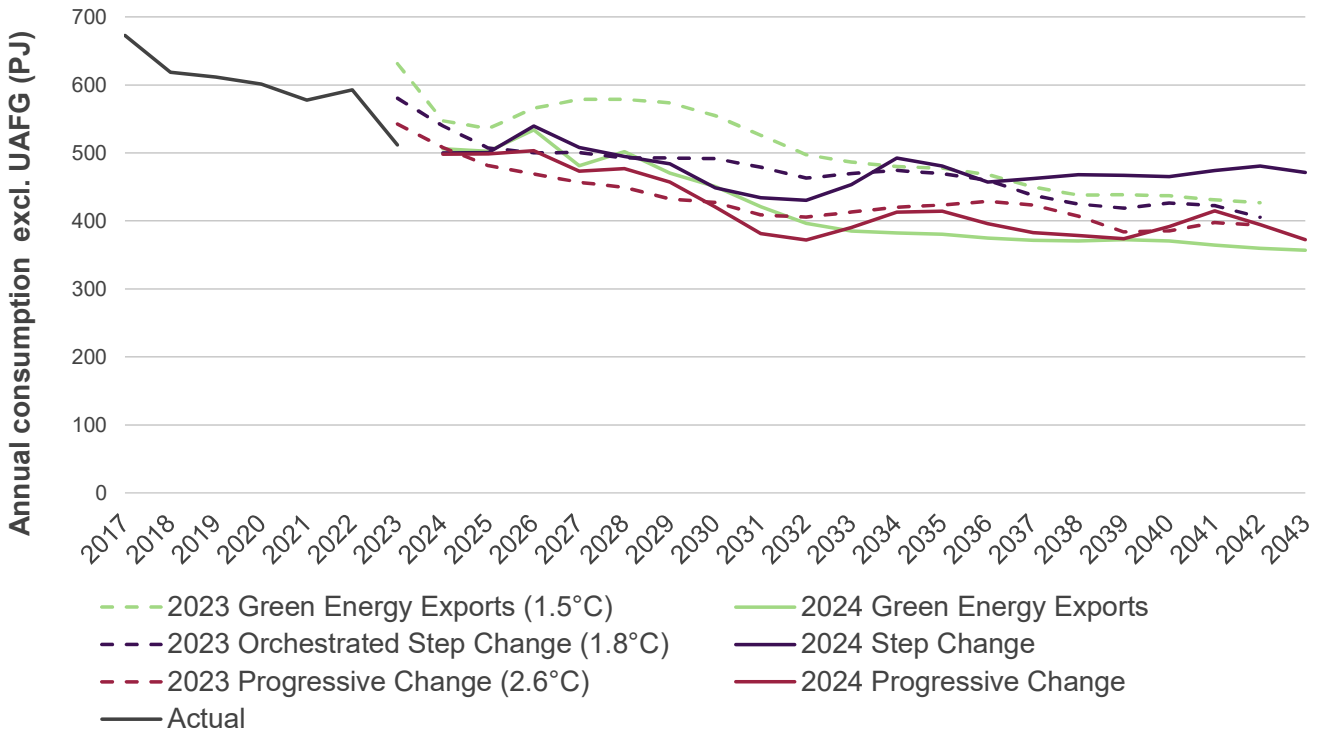
Demand forecasts

Domestic gas consumption forecast

- AEMO considers a number of future scenarios with varying economic, policy, consumer-driven and technology settings
- The 2024 GSOO and VGPR focus on ***Step Change***

Actual and forecast total annual gas consumption, all sectors, all scenarios, and compared to 2023 GSOO, 2017-43 (PJ)



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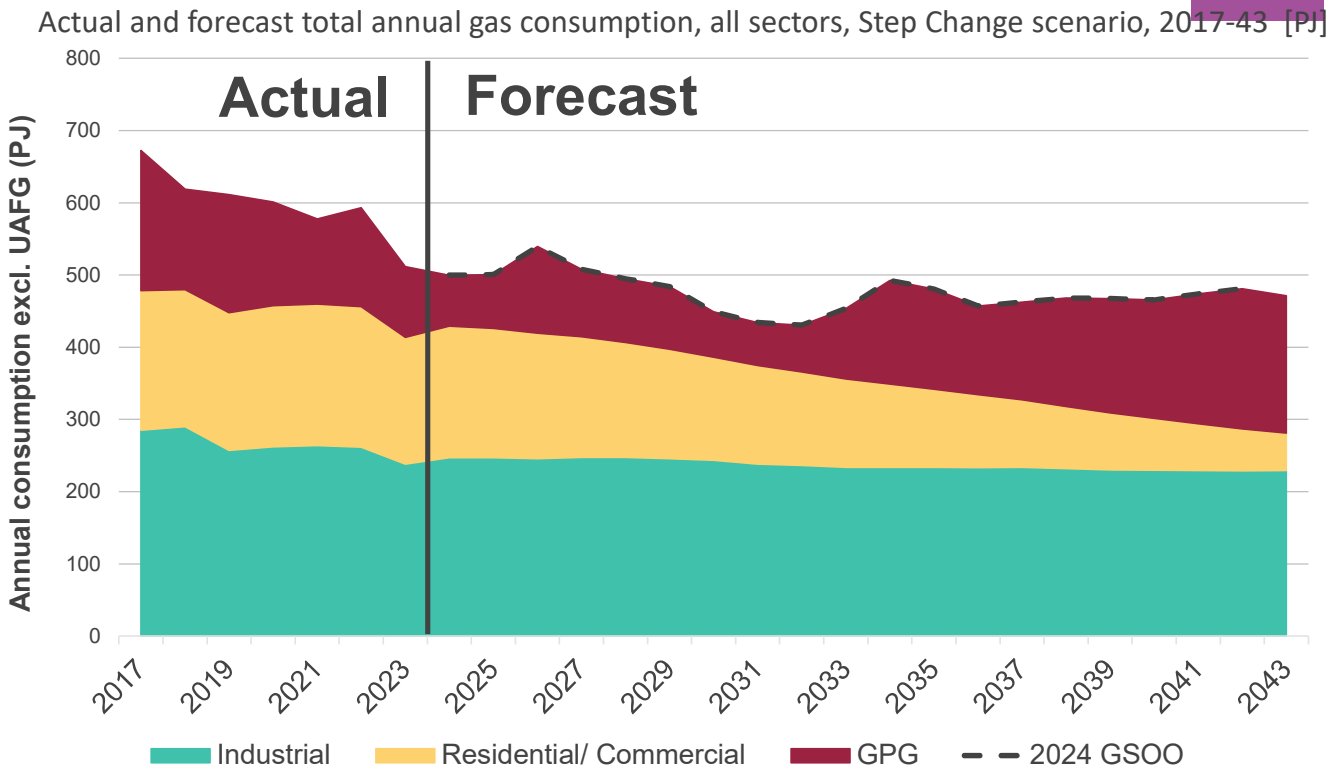
Domestic gas consumption forecast

- Stable industrial demand
- Declining residential and commercial demand
- GPG increasing with renewables firming requirements



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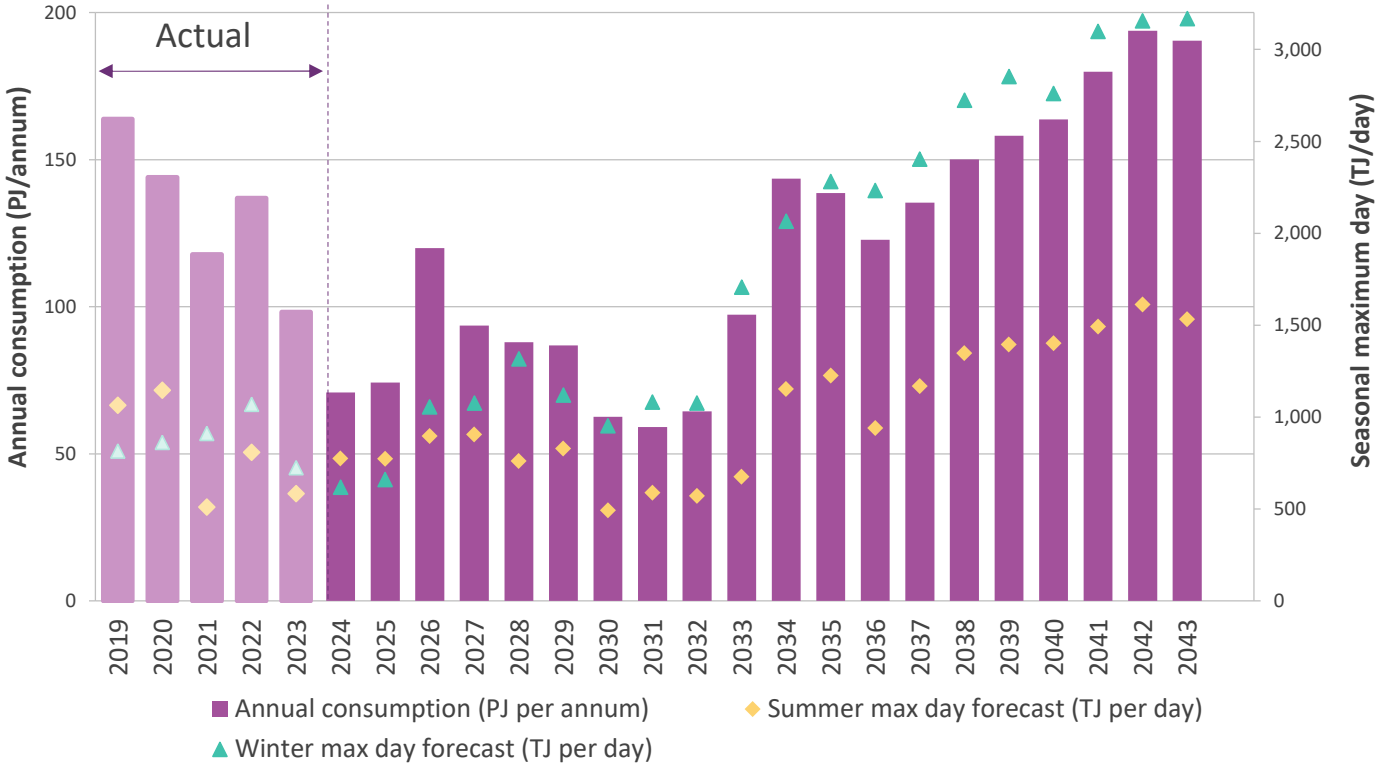
Gas generation forecast

- GPG consumption for the NEM is stable in the near-term and then increases from 2032 to provide firming per the 2024 Draft ISP
- As consumers electrify heating loads, winter gas generation peak demand with increase in magnitude and peakiness

Actual and forecast NEM and Northern Territory gas generation annual consumption (PJ/y) and seasonal maximum daily demand (TJ/d), Step Change scenario, 2019-43



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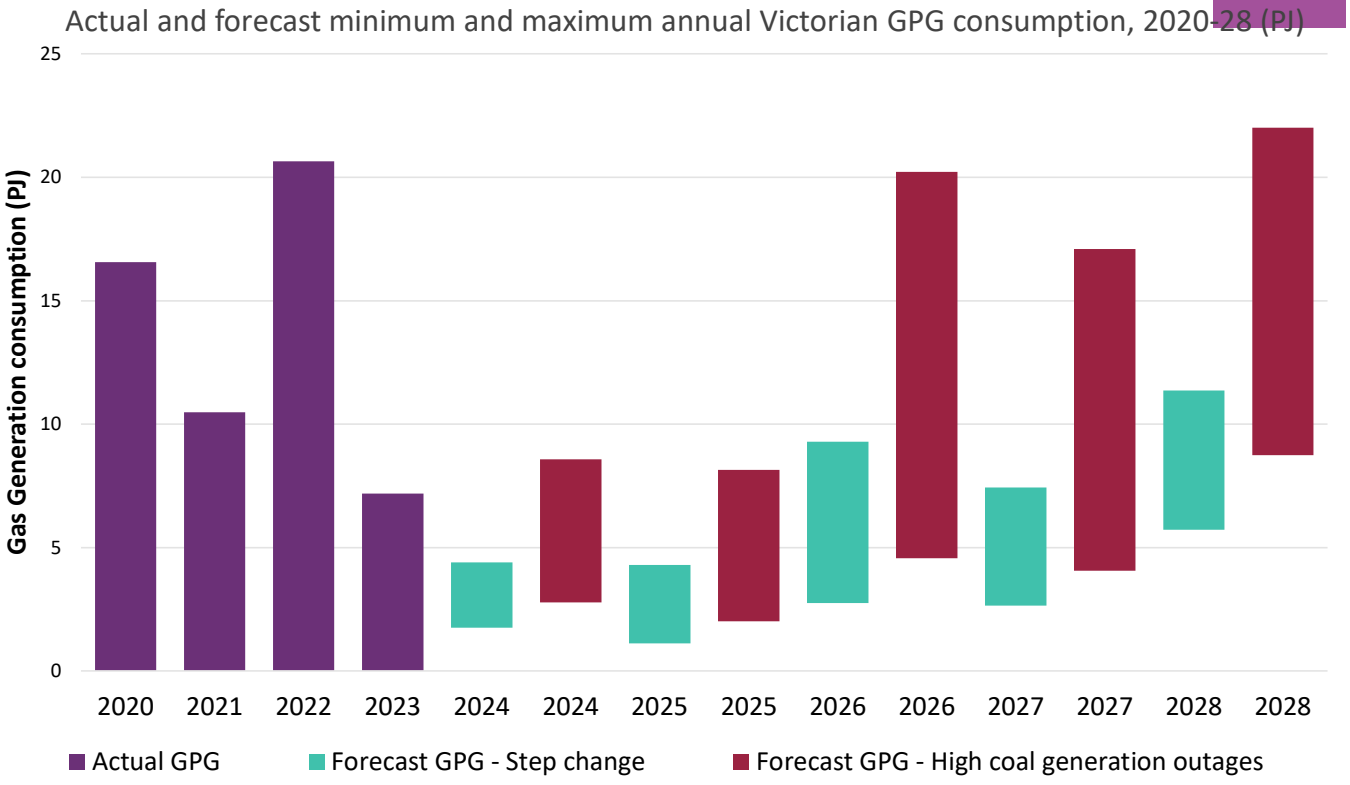
Gas generation forecast

- Availability of the coal generators has a strong influence on the GPG forecast
- Extended coal outages occurred in 2019, 2021 and 2022



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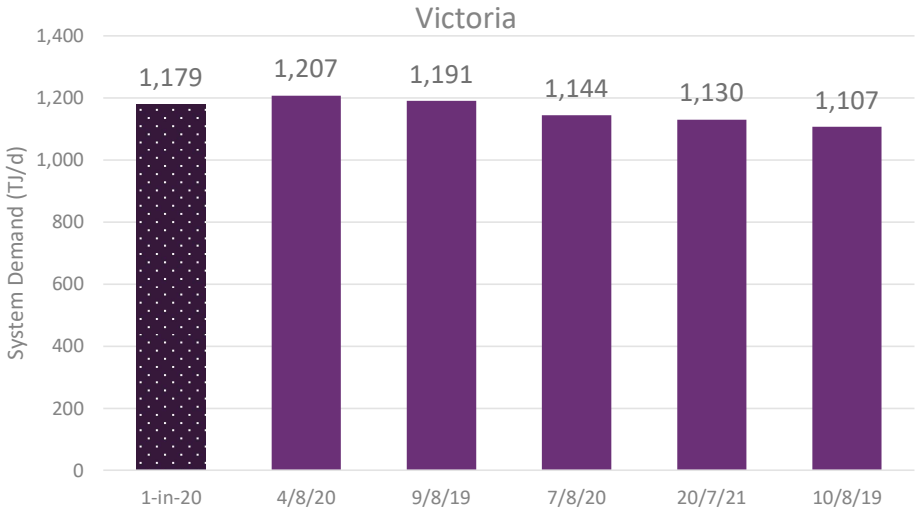
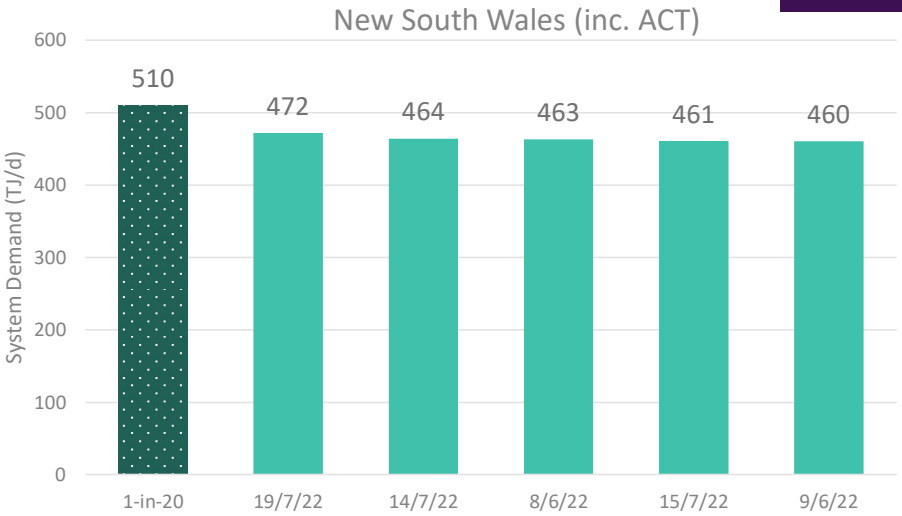
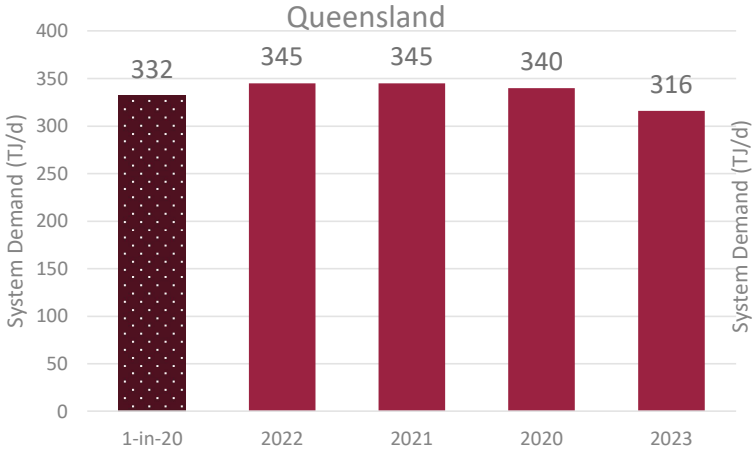
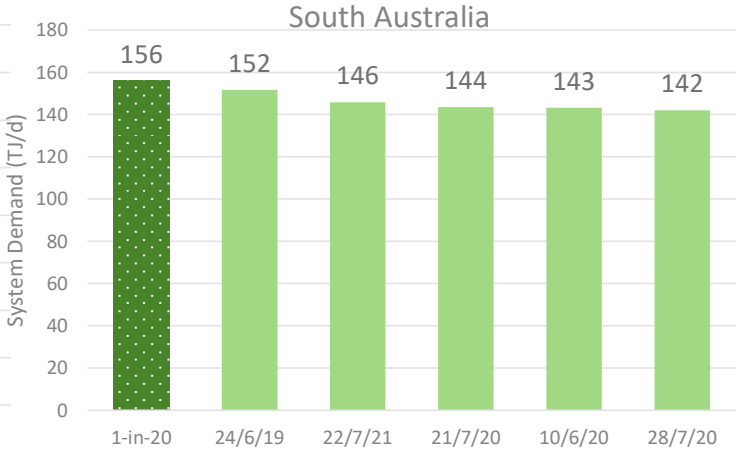
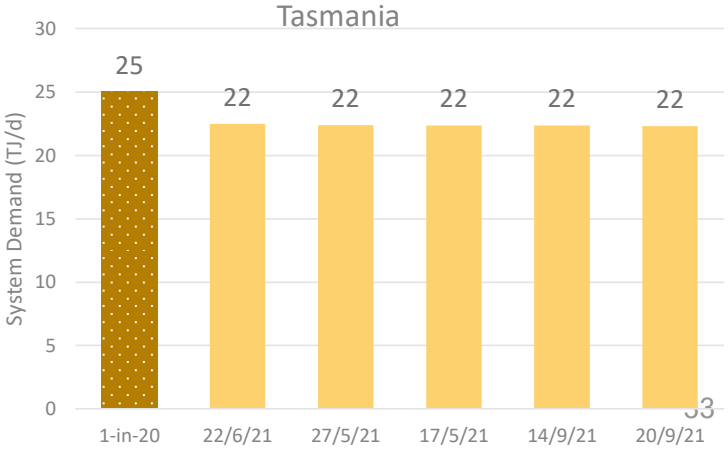
2024 peak day forecasts





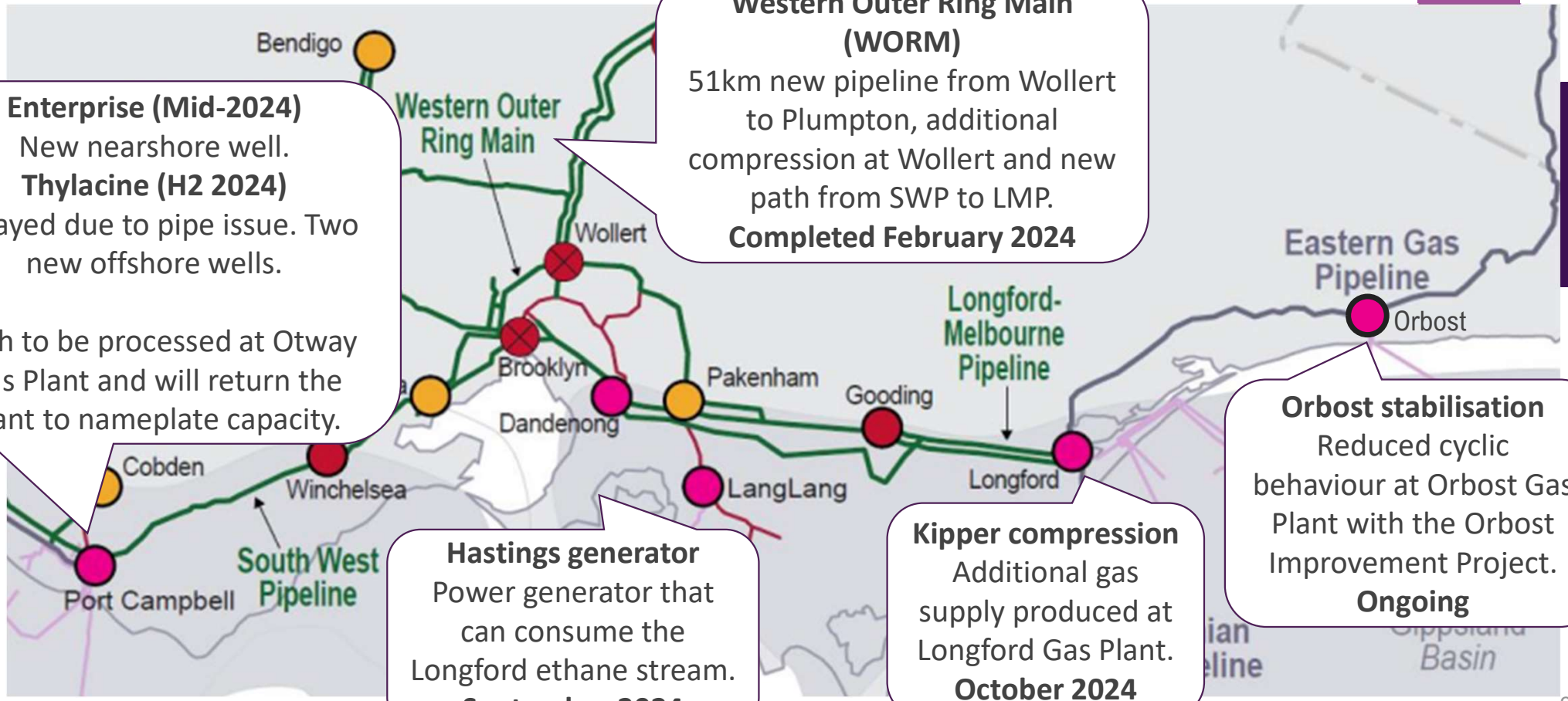






Projects in 2024

2024 projects – Victoria



Western Outer Ring Main (WORM)
51km new pipeline from Wollert to Plumpton, additional compression at Wollert and new path from SWP to LMP.
Completed February 2024

Enterprise (Mid-2024)
New nearshore well.
Thylacine (H2 2024)
Delayed due to pipe issue. Two new offshore wells.

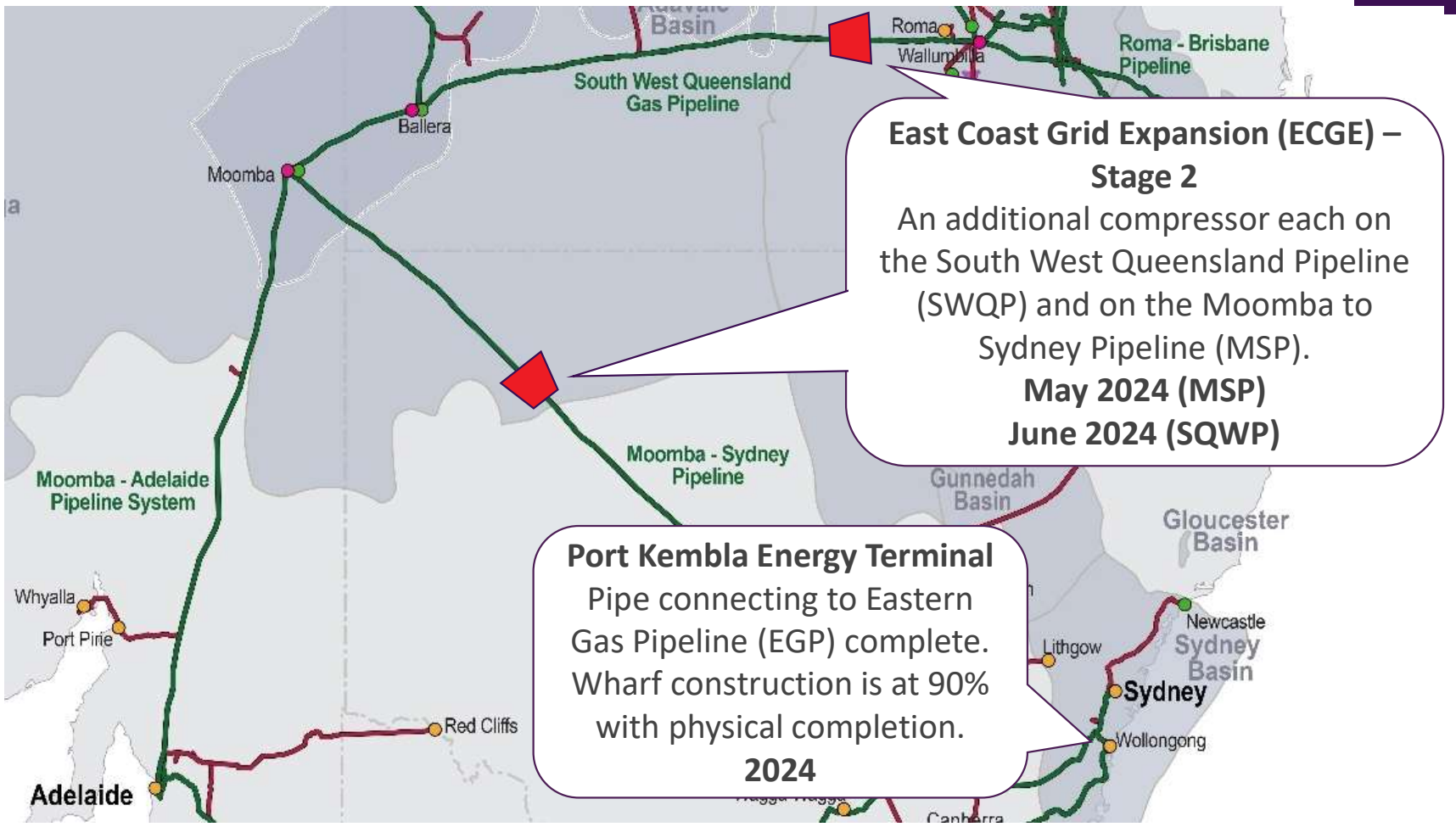
Both to be processed at Otway Gas Plant and will return the plant to nameplate capacity.

Orbost stabilisation
Reduced cyclic behaviour at Orbost Gas Plant with the Orbost Improvement Project.
Ongoing

Hastings generator
Power generator that can consume the Longford ethane stream.
September 2024

Kipper compression
Additional gas supply produced at Longford Gas Plant.
October 2024

2024 projects – NSW/Qld



East Coast Grid Expansion (ECGE) – Stage 2

An additional compressor each on the South West Queensland Pipeline (SWQP) and on the Moomba to Sydney Pipeline (MSP).

May 2024 (MSP)

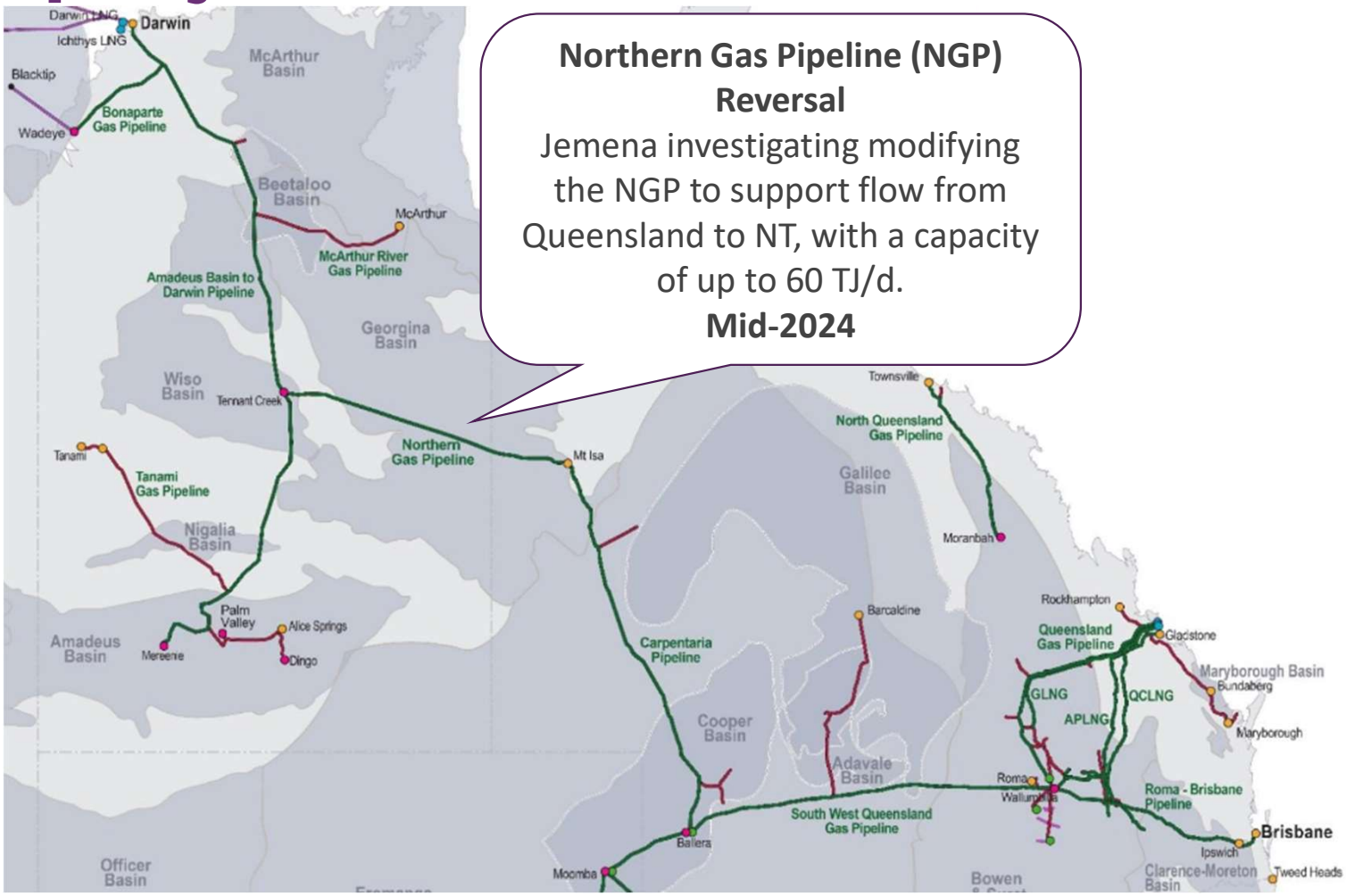
June 2024 (SQWP)

Port Kembla Energy Terminal

Pipe connecting to Eastern Gas Pipeline (EGP) complete. Wharf construction is at 90% with physical completion.

2024

2024 projects – NT



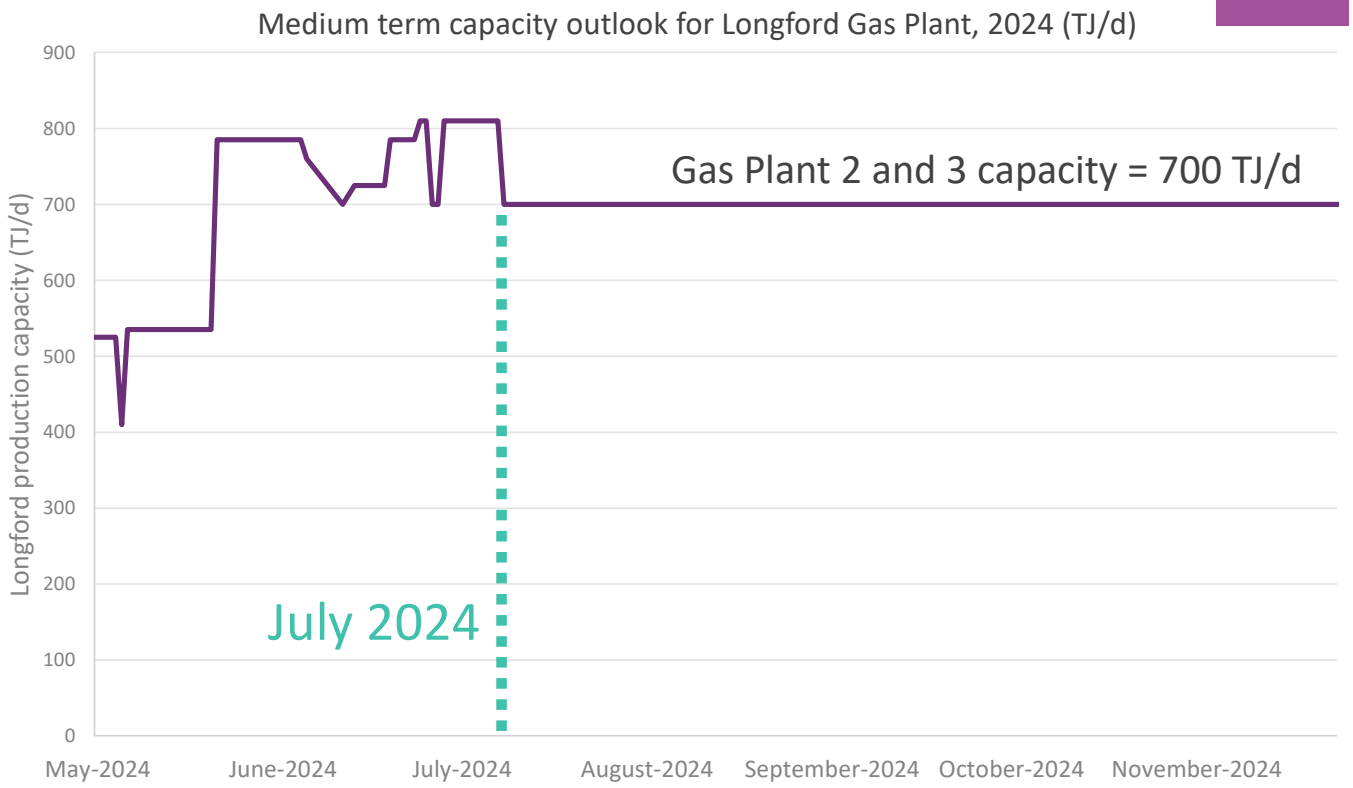
Northern Gas Pipeline (NGP) Reversal

Jemena investigating modifying the NGP to support flow from Queensland to NT, with a capacity of up to 60 TJ/d.

Mid-2024

Longford Gas Plant 1 closure

- Closure of one of the three gas plants at Longford planned for July
- Snapper also to significantly decline in 2024



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Potential projects

ECGE Stage 3a, 3b and 4 (APA Group)	Additional capacity for SWQP and MSP.
	Stage 3a could be completed by mid-**2025**, Stage 3b by mid-**2026** and Stage 4 by mid-**2027**.
Turrum Phase 3 & Late Life Optimisation (GBJV)	Backfill gas for Longford Gas Plant.
	Proposed Turrum Phase 3 gas from **2026**.
Port Kembla Energy Terminal (Squadron Energy)	Pipeline complete and wharf to be completed in 2024.
	Proposed to start imports for **2026**.
Outer Harbor LNG Project (Venice Energy)	Stage 1 enabling works complete and have entered a new FSRU agreement.
	Proposed for **2026**.
Golden Beach (GB Energy)	Drilled appraisal well in July 2023 and completed a post-drilling evaluation program.
	Proposed for **2027**.
Viva Energy Gas Terminal Project	Continuing to progress the supplementary data request for their Environmental Effects Statement.
	Proposed for **2027**.
Vopak Victoria LNG	EES referral decision in August 2023: requires an EES.
	Proposed for **2028**.

Winter 2024 adequacy

Supply outlook

Gippsland and Bass Basin

(Longford, Orbost, Lang Lang)

- Prior to mid-July winter supply: 886 TJ/d.
- Post mid-July winter supply: 776 TJ/d
- Step down in winter production capacity due to retirement of Gas Plant 1, as large legacy fields decline.

Otway Basin

(Otway, Athena, Iona UGS)

- Winter 2024 production: 149 TJ/d increasing to 225 TJ/d.
- Supply increasing with the connection of the new Thylacine wells and Enterprise to Otway.
- Iona UGS winter 2024 capacity: 570 TJ/d.

Cooper Eromanga Basin

(Moomba)

- Winter 2024 supply: 250 TJ/d.

Northern

(Queensland, NT)

- Sufficient Queensland supply to support LNG exports and domestic demand.
- Ongoing supply issues for Blacktip. Supply currently supplemented with gas from Darwin LNG exporters.

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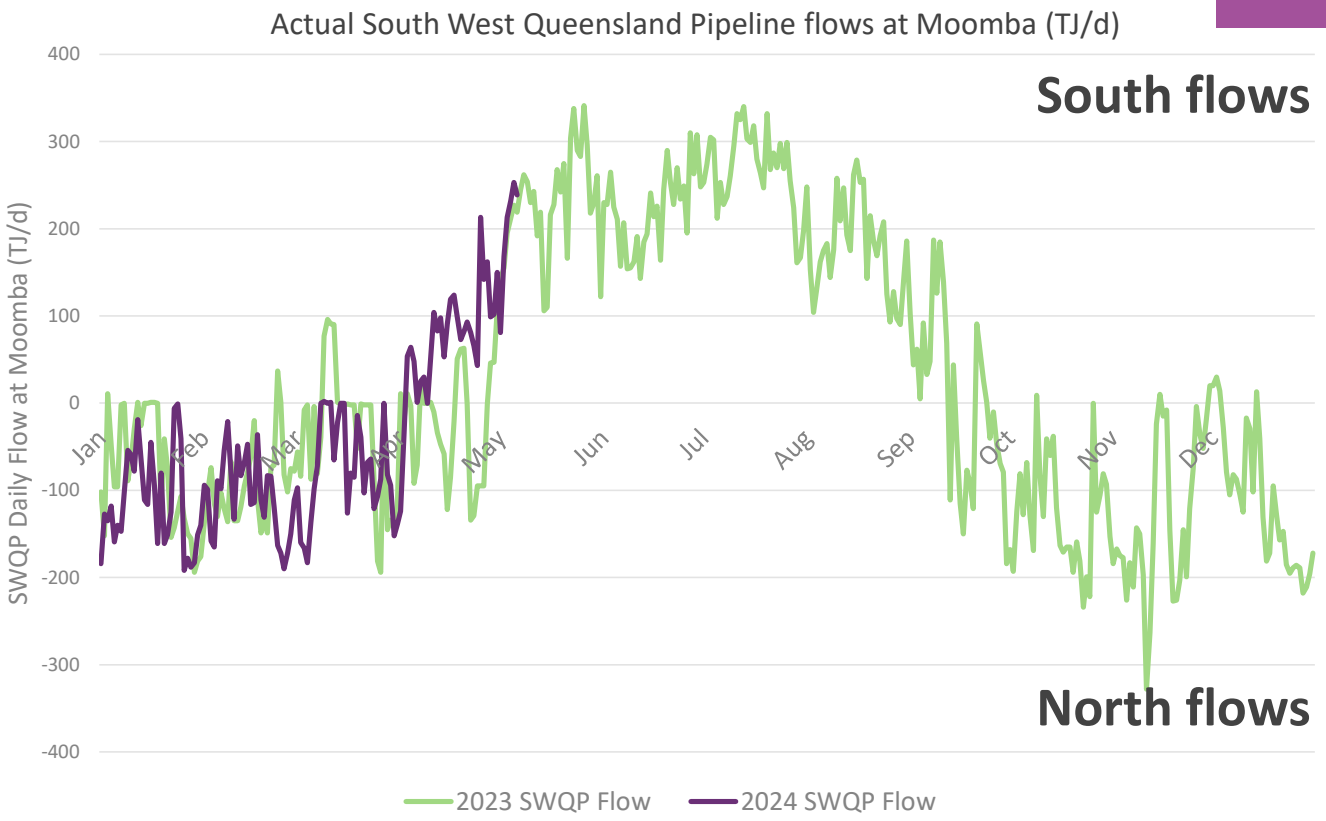
Flows from Qld to southern states

- The SWQP switched from flowing north to flowing south at the start of April
- GSOO modelling indicates 13-24 PJ of northern gas is required south for winter 2024
  - 28 PJ transported for winter 2023.
  - AEMO and ACCC modelling indicates this gas should be available



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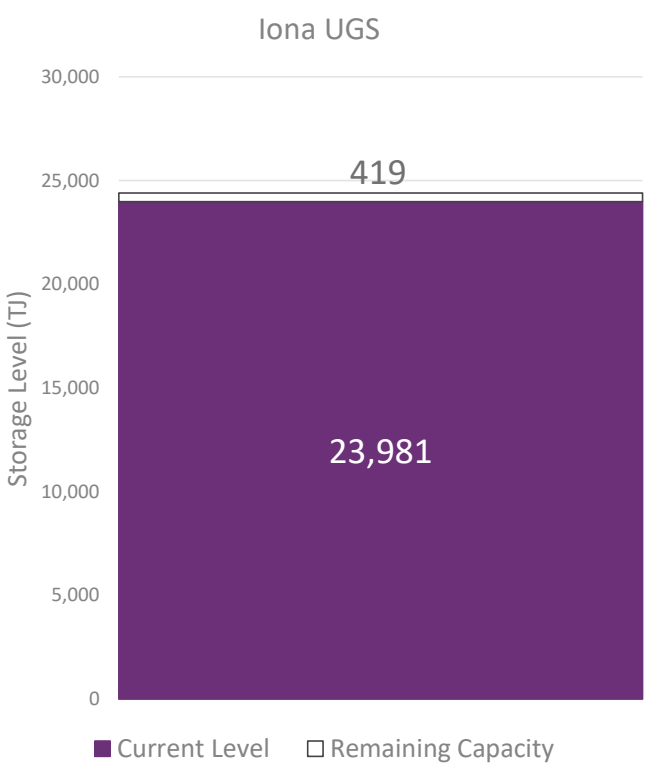
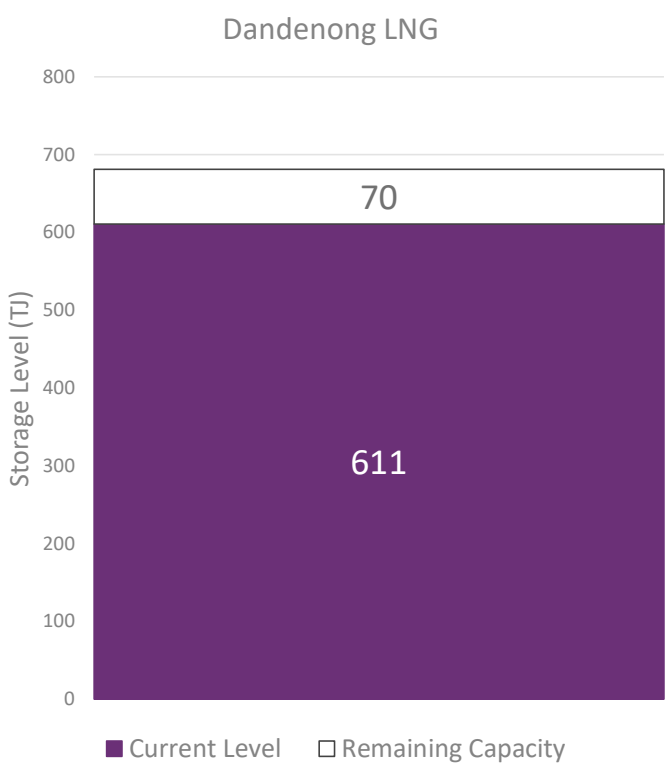
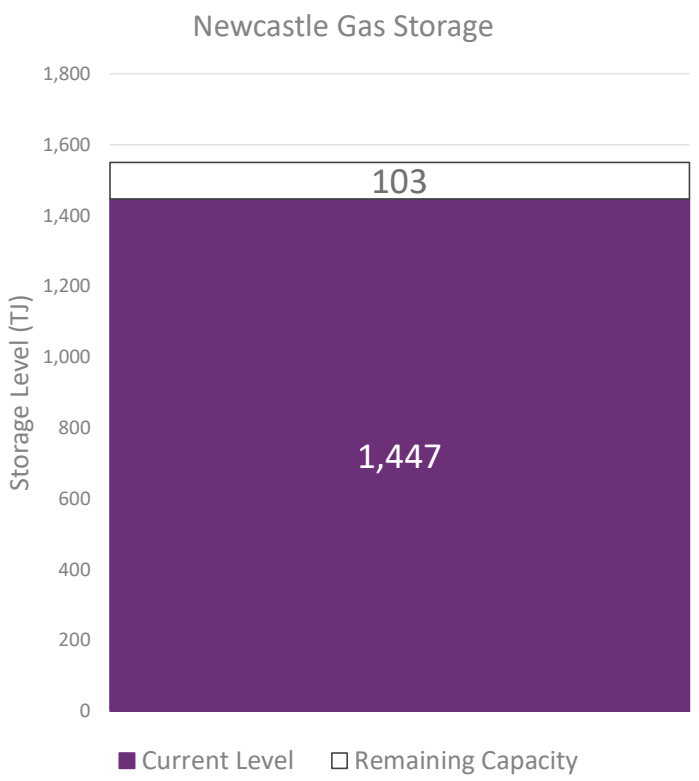
Storage status



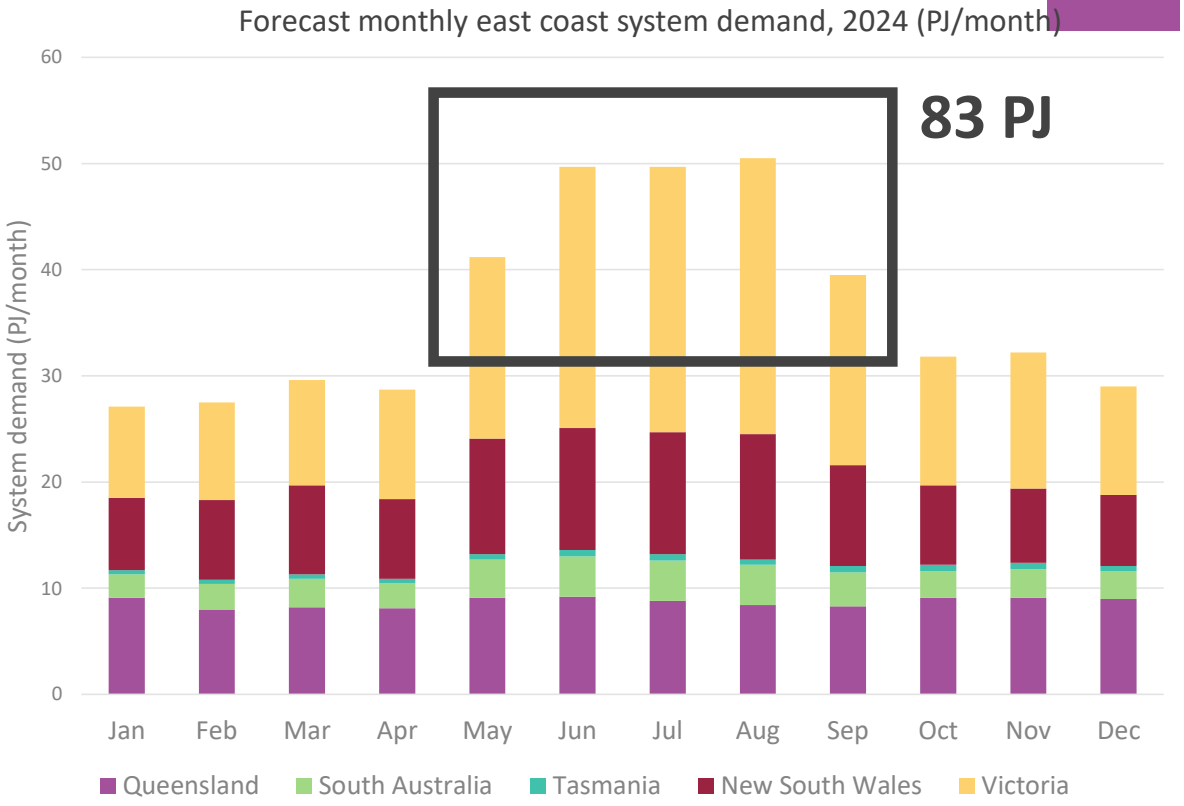




Questions? Slido.com #AEMOWinter2024

Seasonal adequacy

- Heating load in colder states (Victoria, NSW, SA) drive a large increase in demand during winter months, around 83 PJ of seasonal demand for winter 2024
- Another 10 PJ of winter GPG
- Seasonal adequacy position looking good ahead of winter 2024



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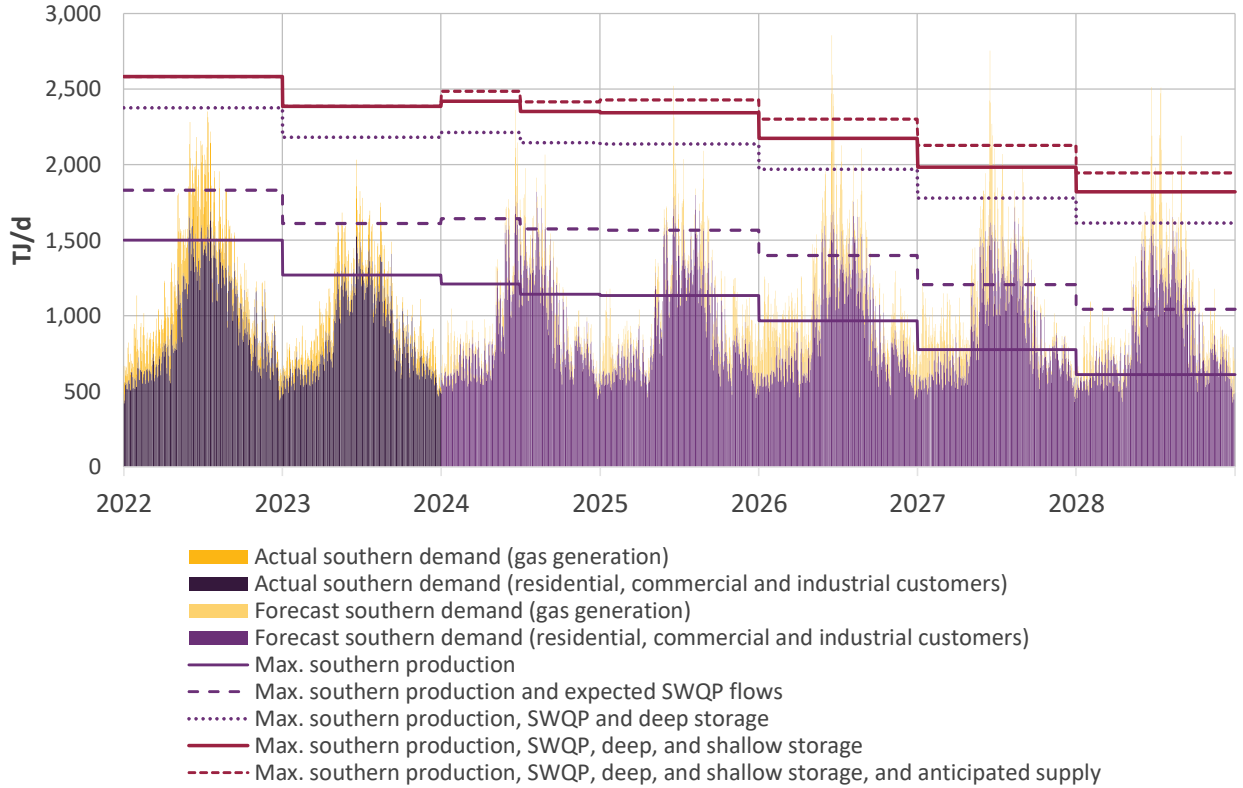
Peak day adequacy

- There is a lower risk for winter 2024 than forecast in the 2023 GSOO
- The 2024 GSOO forecasts peak day shortfalls from 2025 under extreme conditions

Actual daily southern gas system adequacy since January 2022, and forecast to 2028 using existing, committed and anticipated projects (TJ/d)

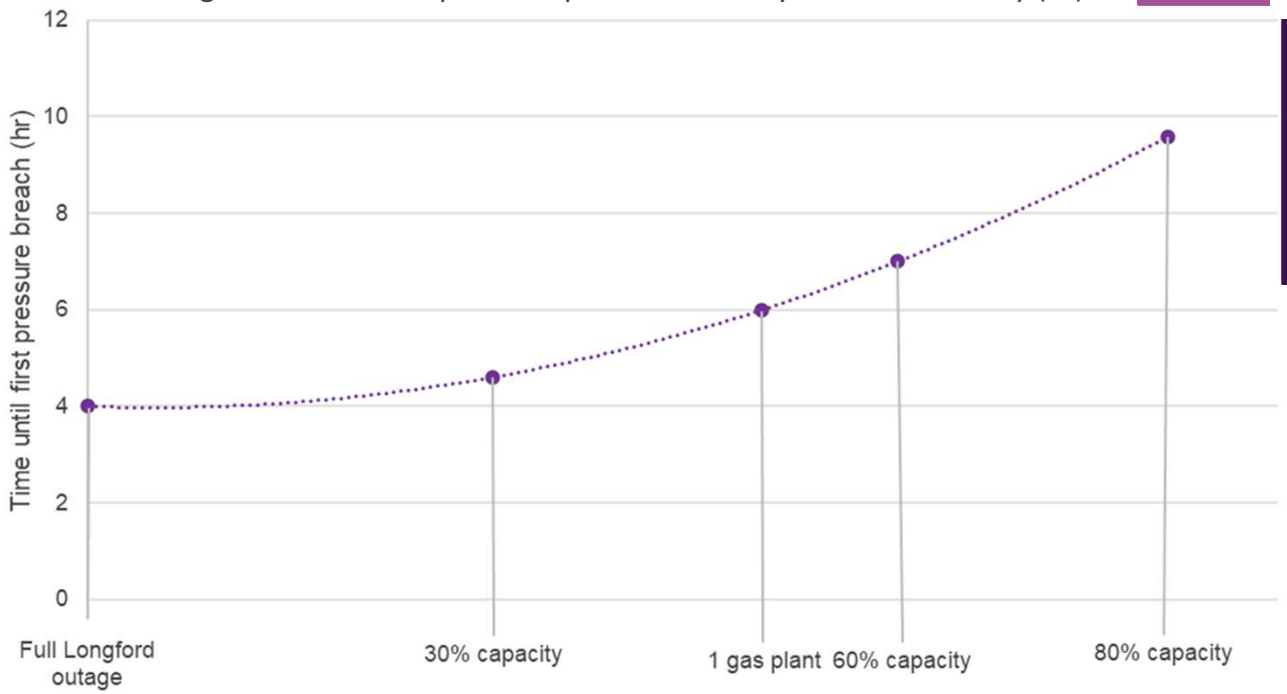


Questions? Slido.com #AEMOWinter2024

Operational resilience

- Retirement of Gas Plant 1 and decline of legacy GBJV fields reduces supply resilience for the southern states
- Other key risks:
  - Unforecast GPG or a prolonged coal outage
  - Production or storage facility outage

Projected time until the first contractual pressure breach in the event of a Longford Gas Plant trip at 2.00 pm on a 1-in-2 system demand day (hr)

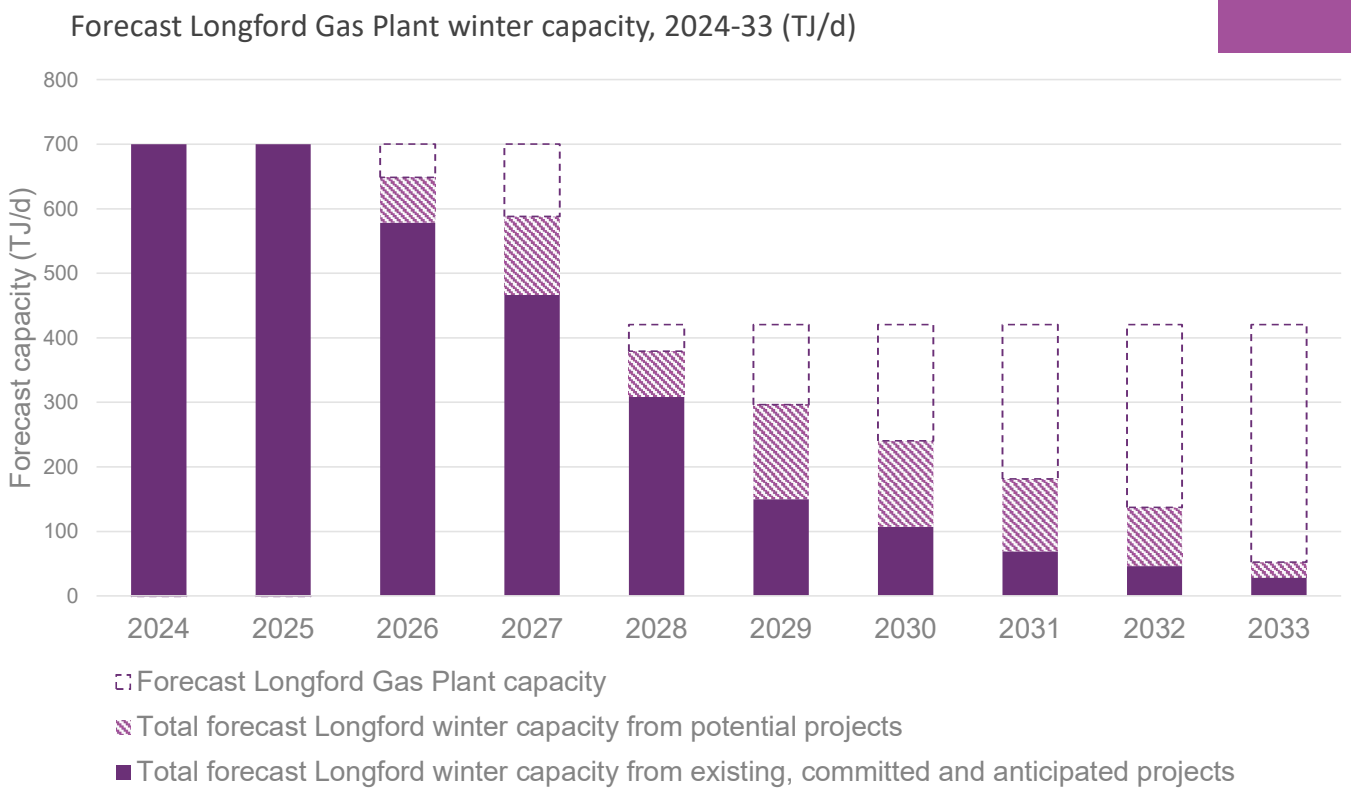


Questions? Slido.com #AEMOWinter2024

Longer term adequacy

Gippsland decline

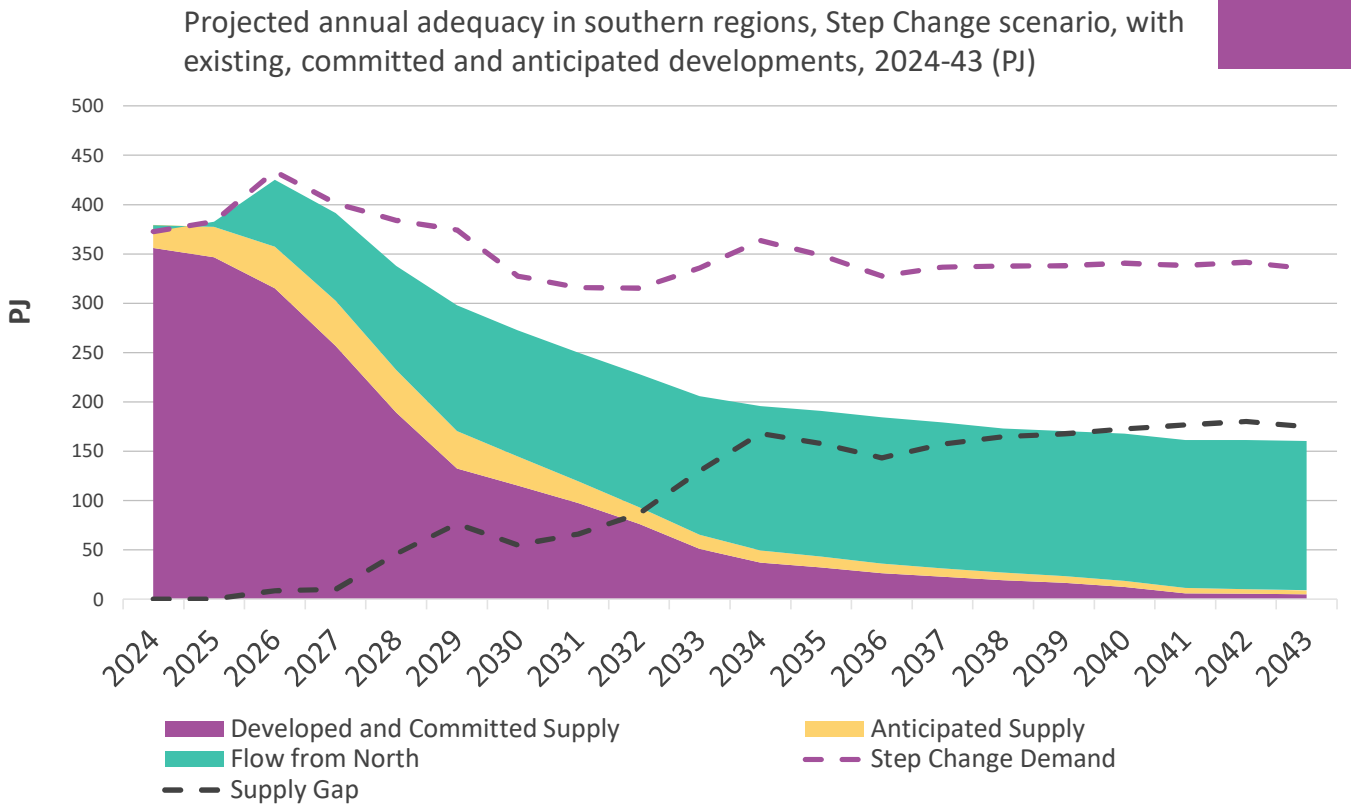
- Longer term, outlook for Gippsland basin fields are in decline and GBJV will retire infrastructure to match offshore production
- For comparison, winter 2022 Longford production was over 1,040 TJ/d



Questions? Slido.com #AEMOWinter2024

Long term production outlook

- The long term outlook for production in the southern states is all decline
- Flows from the north increase but are limited by the SWQP capacity

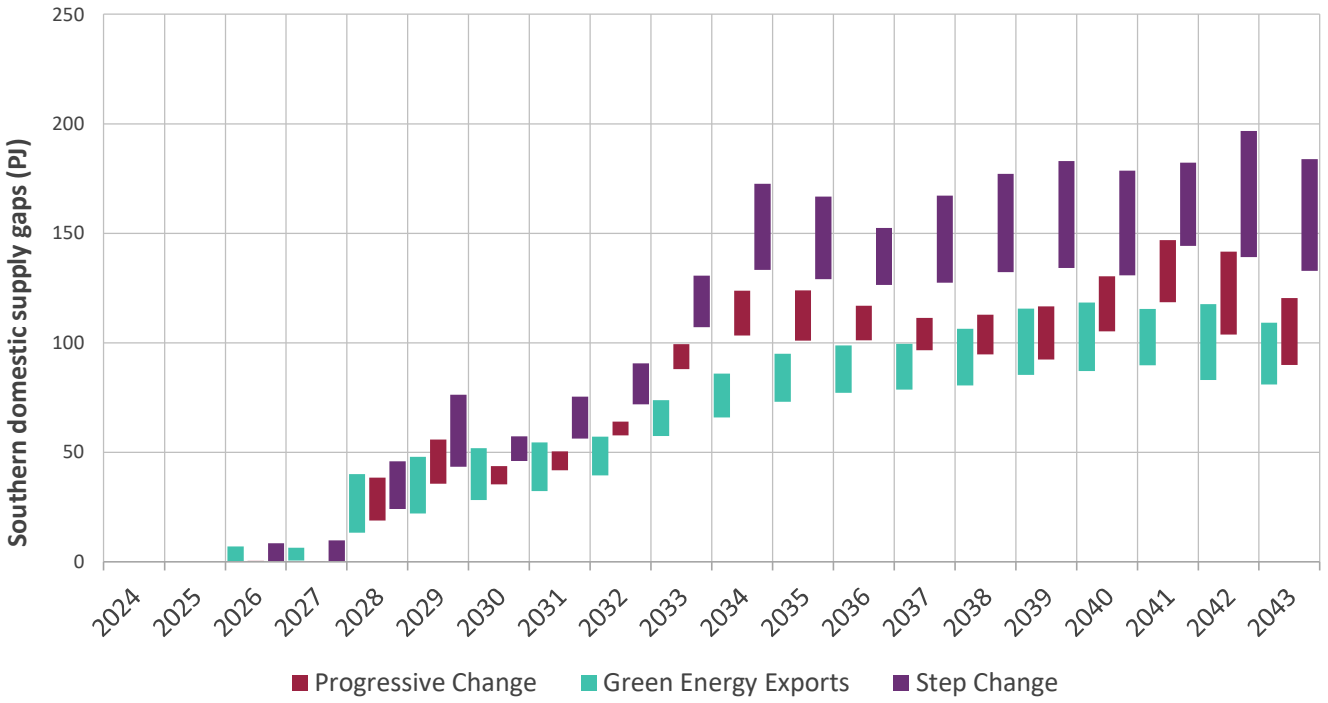


Questions? Slido.com #AEMOWinter2024

Long term adequacy

- Gaps start to appear in 2026 but are reasonably small, about 10 PJ
- Larger gaps from 2028, at around 50 PJ
- Very big gaps from 2033, over 150 PJ

Range of domestic annual supply gaps forecast in southern regions based on existing, committed, and anticipated developments, all scenarios, 2024-43 (PJ)



Questions? Slido.com #AEMOWinter2024

Summary

Winter 2024 risks

New risks

Reduced redundancy
(Gas Plant 1 closure)

Reduced supply resilience
(Snapper depletion)

Ongoing risks

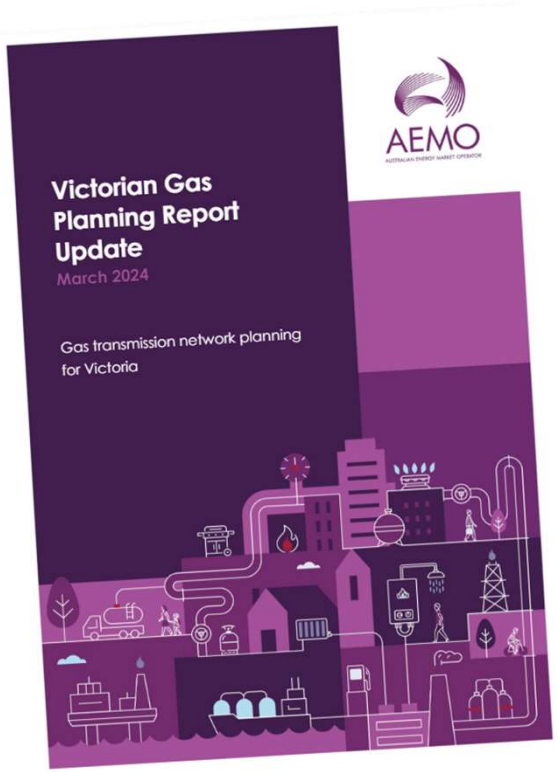
Unforecast GPG on a high system demand day

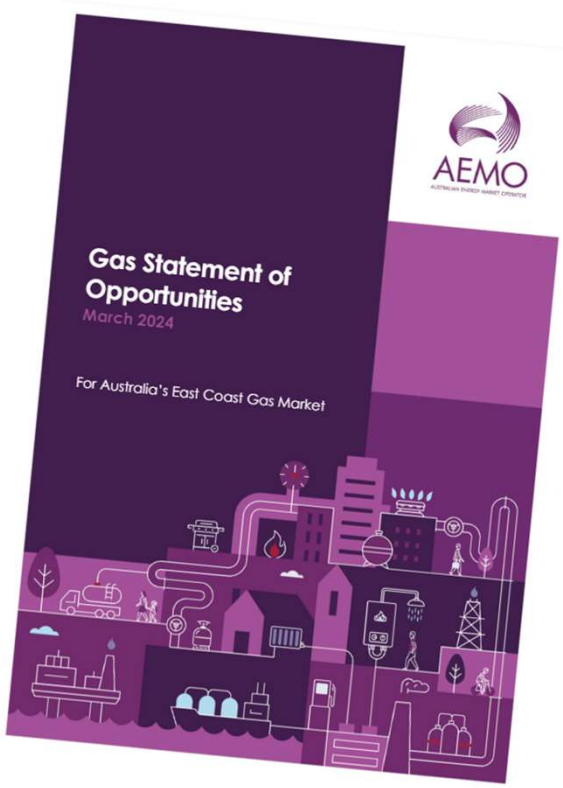
Facility outage

Prolonged coal generation outage

Storage depletion or Queensland gas not available

Questions? Slido.com #AEMOWinter2024





Read the 2024 VGPR Update at: https://aemo.com.au/en/energy-systems/gas/gas-forecasting-and-planning/victorian-gas-planning-report

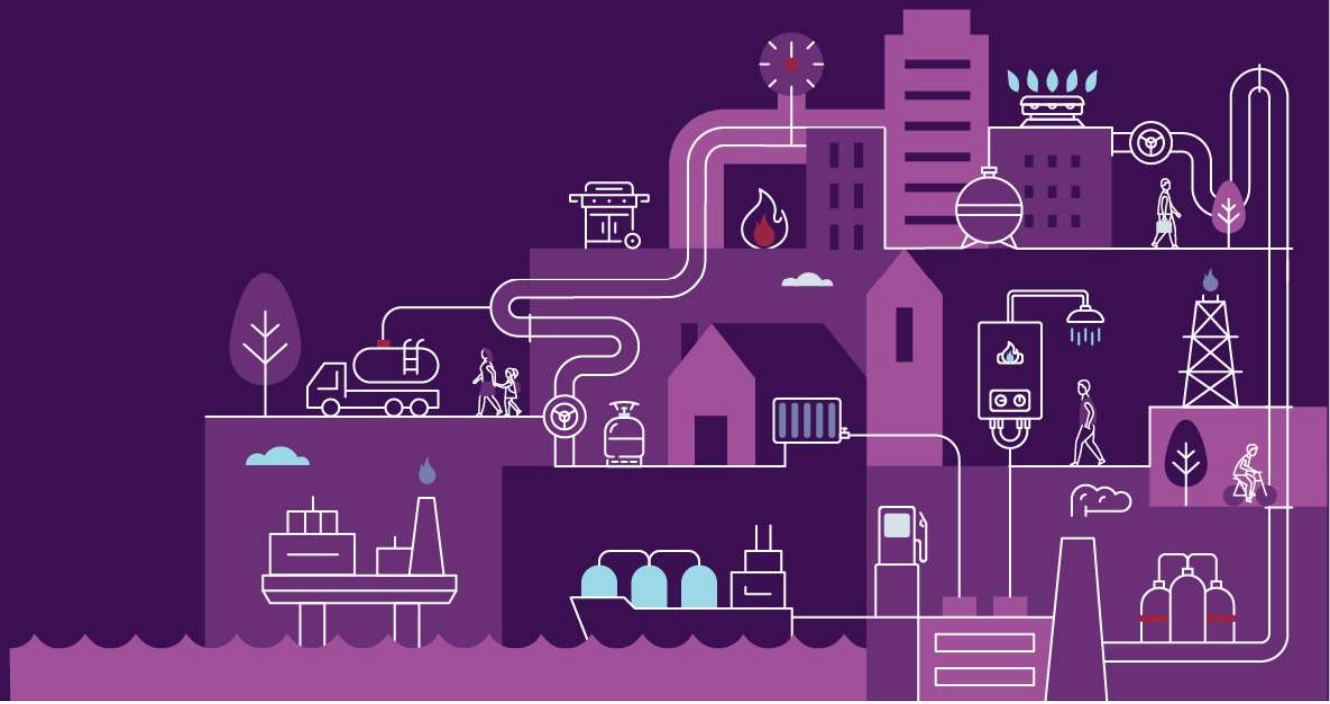
Read the 2024 GSOO at: https://aemo.com.au/en/energy-systems/gas/gas-forecasting-and-planning/gas-statement-of-opportunities-gsoo

View the GSOO webinar at: 2024 Gas Statement of Opportunities (GSOO) publication webinar – YouTube

Questions? Contact GasPlanning@aemo.com.au

NEM Winter Readiness 2024

AEMO Operations



Agenda

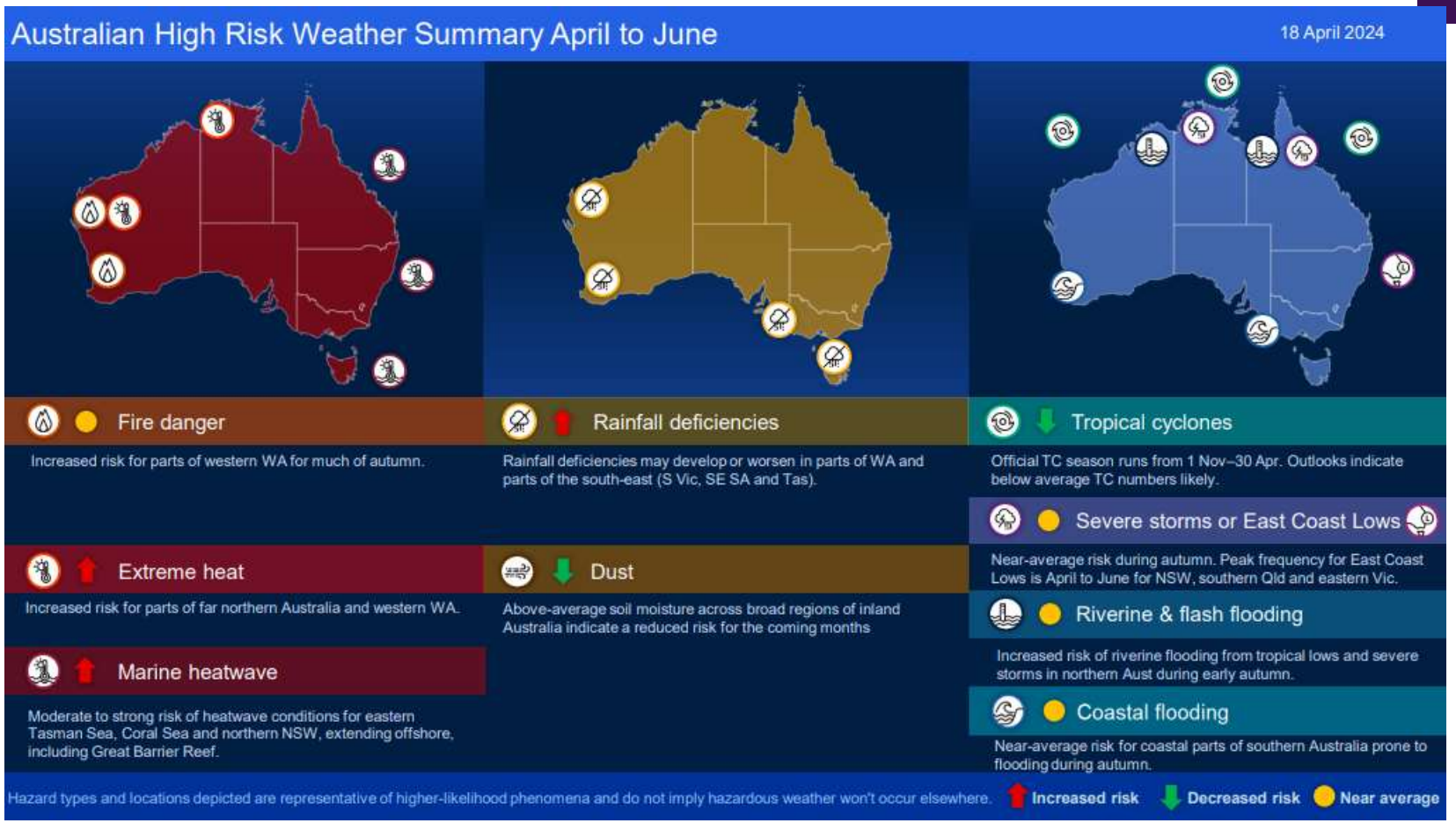
- Winter outlook
- Weather and climate
- Generation availability
- Operational demand
- Gas supply adequacy
- Network outages and augmentations
- Reliability emergency reserves (RERT)
- Risk review

Winter outlook

Improved
Similar or unchanged
Potential to get worse

Impact	Status	Comparison to last winter
Extreme cold snaps		Similar, warmer conditions expected for majority of the country. BOM forecast indicates below average potential for cold extremes / frost days however cold snaps could still arise.
Widespread flooding		Similar, median or below median rainfall likely for northern and southern parts of the country reducing risk of flooding. Above median rainfall likely for the inland areas and some coastal areas.
Extreme peak demand		Similar mild conditions expected, however cold snaps have the potential to drive electricity winter demands higher particularly in the NSW region and gas demands across southern regions. Gas consumption and peak day demand is highly weather-dependant and is anticipated to be higher than in 2023 (warmest winter on record).
Generation availability		More VRE / BESS capacity and additional synchronous generation (2,500 MW) expected to be available in the NEM due to expected return to service of major coal plant and reduced maintenance activities.
Network outages		Similar volume of planned electricity network High Impact Outages (HIOs) except for Victoria where volume is increasing due to project works. No major outages of gas system plant.
Reliability		Similar, loss of load probability (LOLP) forecast is low (NSW < 30%, Queensland < 5% and zero for all other regions). Potential for unplanned plant outages and/or project/generation delays to lower electricity / gas system reliability.
Fuel supply		Similar levels of coal stockpiles for the NEM. Gas storage generally at high levels while Victorian gas production capacity has decreased, increasing the amount of gas required from Queensland.
Health of markets		Prudential risks / extreme energy price risks are similar to 2023 and significantly lower compared to 2022 season for the NEM.

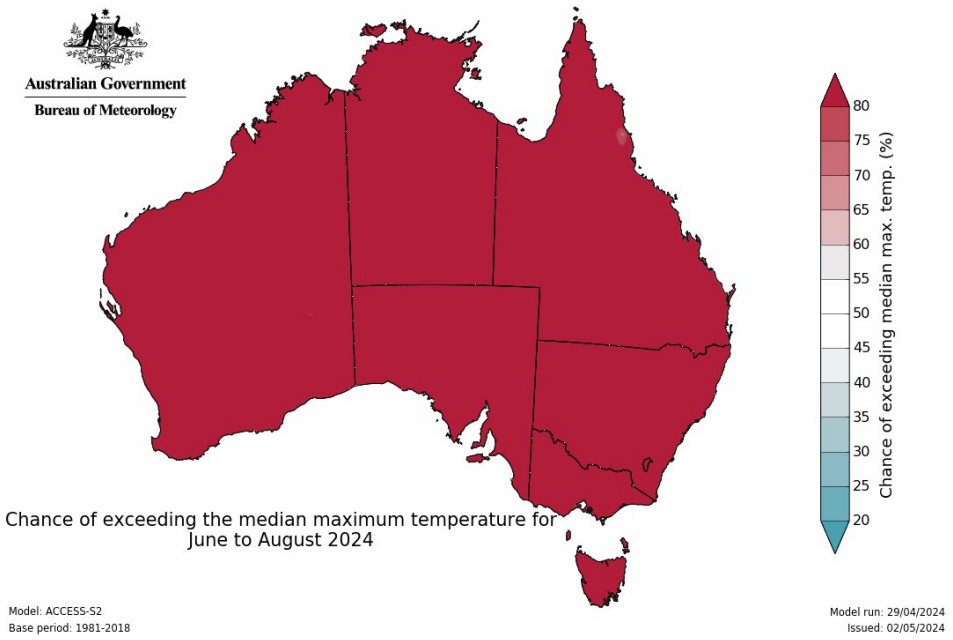
High risk weather summary



Source: Bureau of Meteorology (18 April 2024)

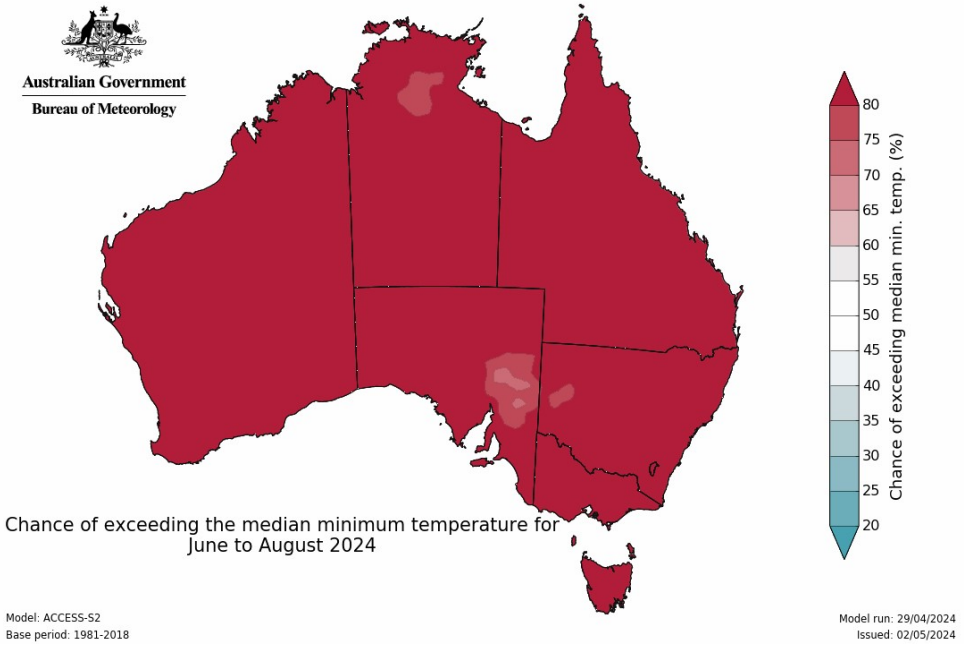
June to August 2024:
climate outlook

Maximum temperatures 2 May 2024



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

Minimum temperatures

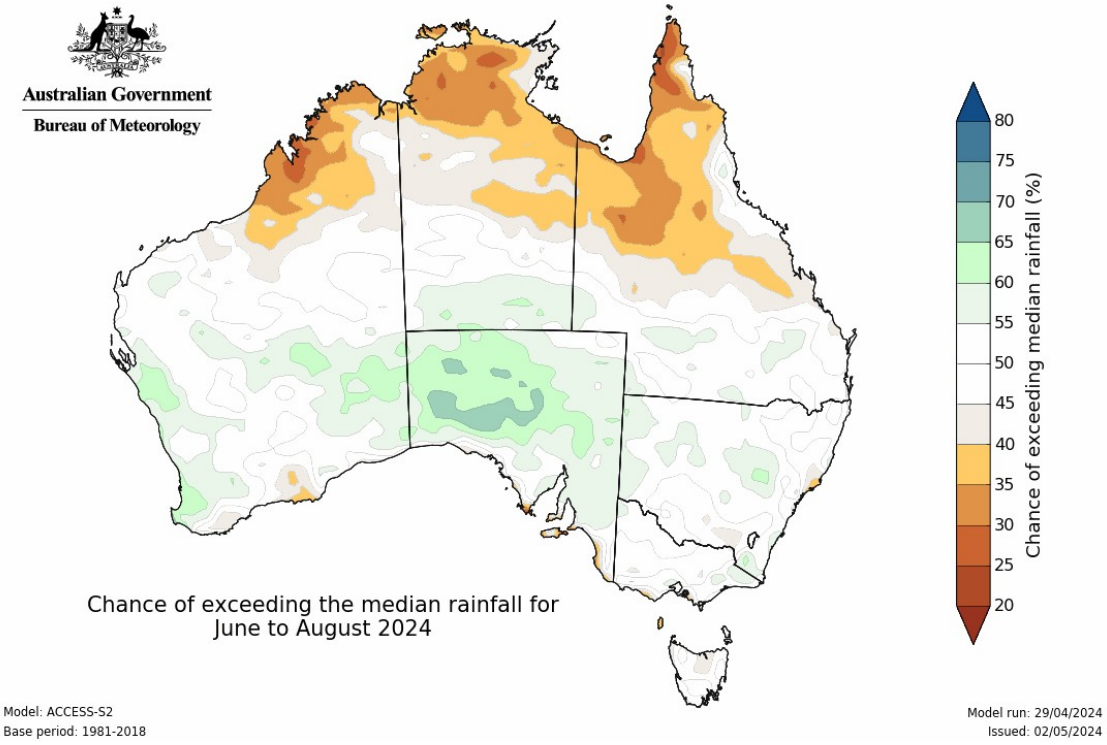


Minimum temperatures are likely to be above median for all of the country.

June to August 2024:
climate outlook

Rainfall (2 May 2024)

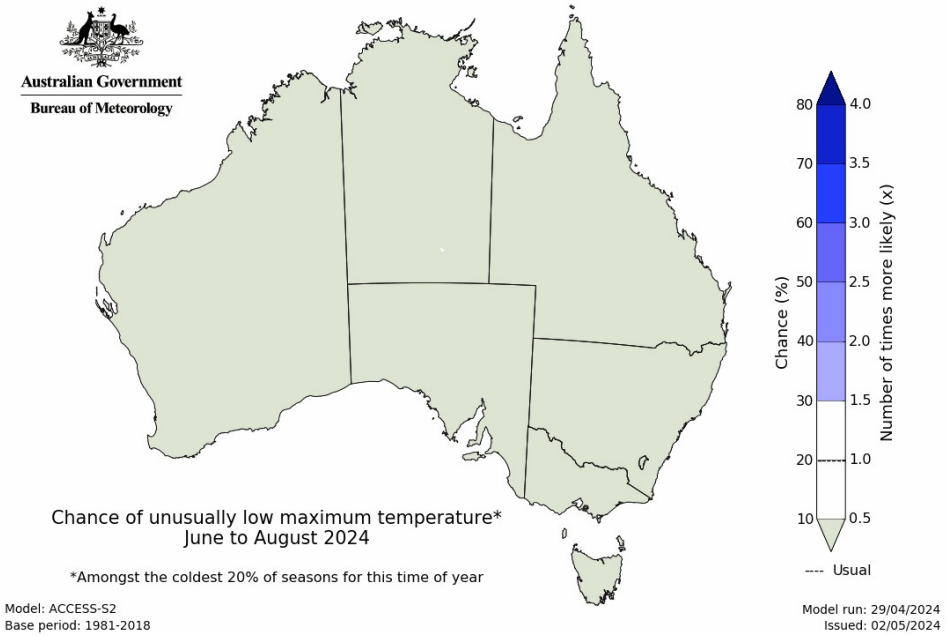
- Below-median rainfall for northern QLD and southern coastal areas of the country
- Above-median rainfall for majority of SA and some parts of southern QLD, NSW and VIC



June to August 2024:
climate outlook

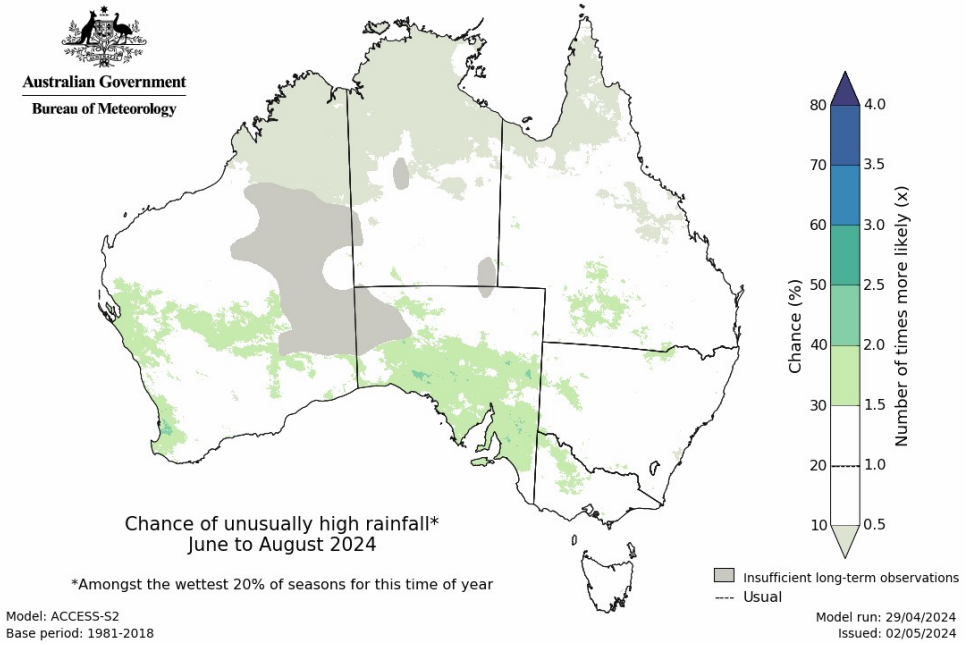
Chance of unusually cold

2 May 2024



Low chance of unusually cold conditions across the country.

Chance of unusually wet



Increased likelihood of unusually wet conditions for South Australia and some inland areas of Queensland, New South Wales and Victoria.

Generation availability

On average, additional 2500 MW of scheduled synchronous generation capacity is expected to be available in the NEM compared to Winter 2023, mainly in NSW, Queensland and Victoria due to reduced planned maintenance activities and units returning to service following prolonged forced outages. In addition, 600 MW of new battery storage capacity is available in the NEM.

Major generator outages / limitations include:

Hydro generation

- Tumut 1, 3 and Murray capacity reductions
- TAS: Reece 2 (July – August) and Gordon capacity reduction

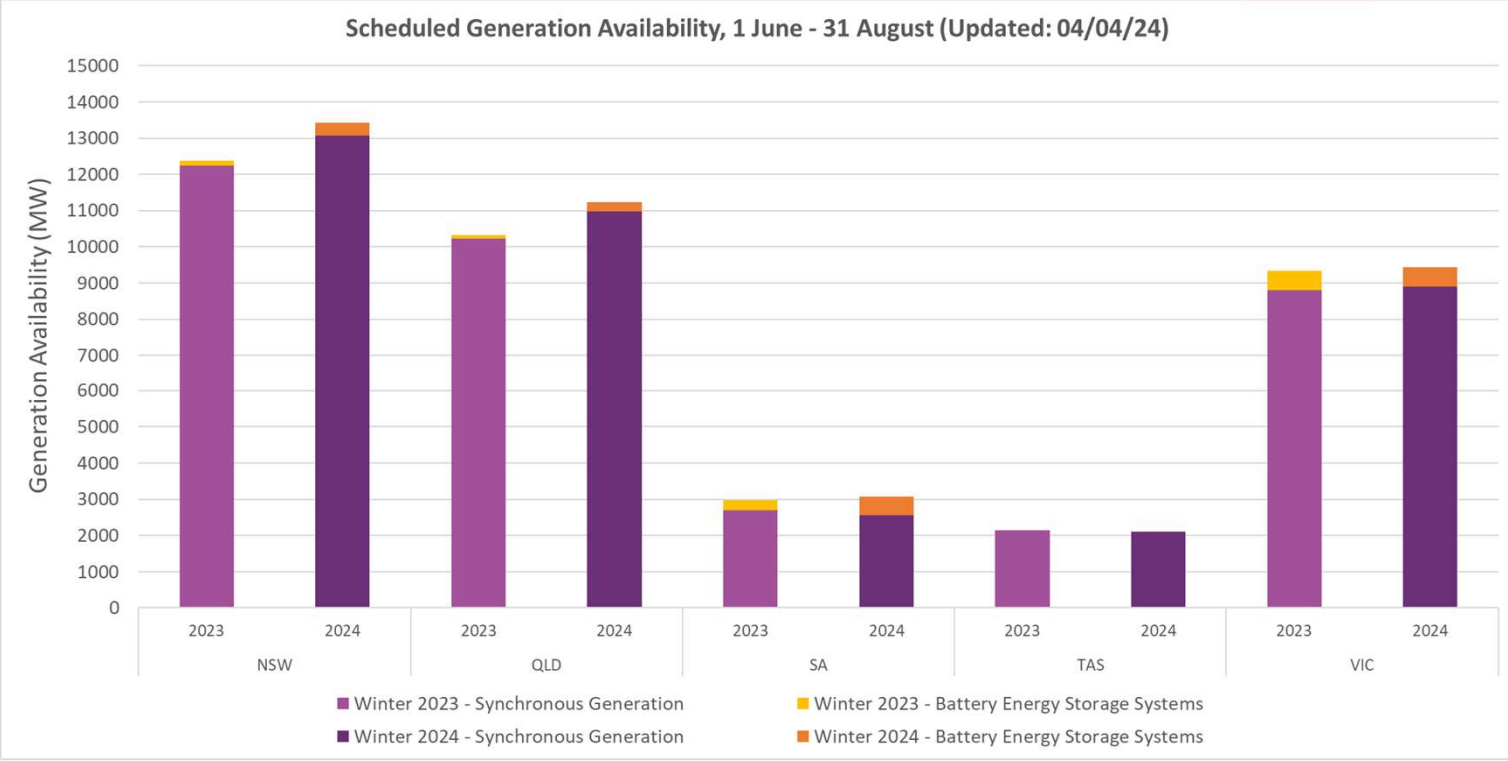
Coal generation

- QLD: Callide B1 & B2 (July – August), Callide C4 (returning from forced outage), Gladstone 4 (June – July), Stanwell 2 (July – August)
- VIC: Yallourn 1 (June)

Gas/diesel generation

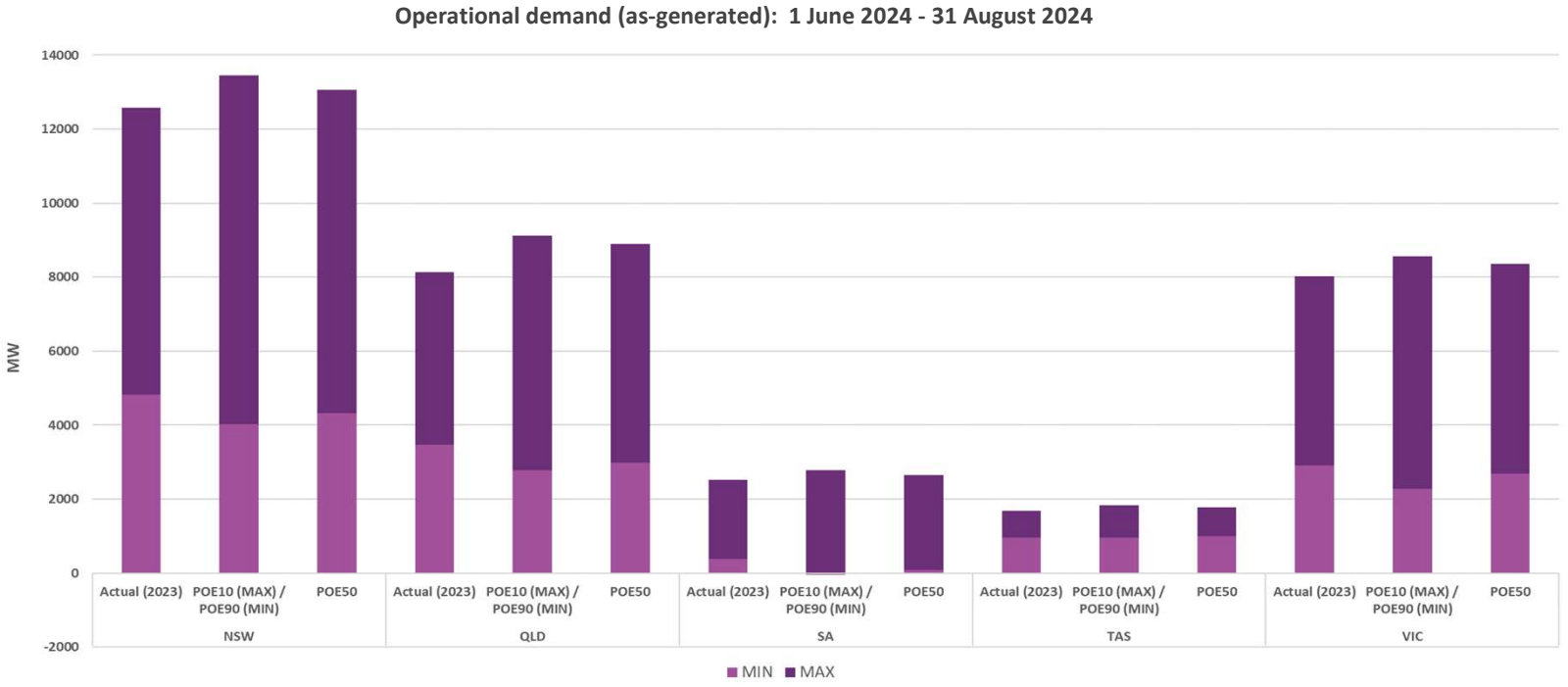
East Coast gas usage to be monitored. Supply from storage / support for Queensland may be required.

- QLD: Braemar 5, 6 & 7 (July – August), Darling Downs (June), Swanbank E (August)
- NSW: Uranquinty 1 & 2 (June), Tallawarra A (August)
- SA: Torrens Island B2 (June), Dry Creek 5 (July – August), Snuggery (mothballed)



Note: Analysis considers generator maintenance, return to service of Callide C3 and C4 (after prolonged forced outages), new gas generating unit at Tallawarra B and additional 600 MW of new battery storage systems in the NEM.

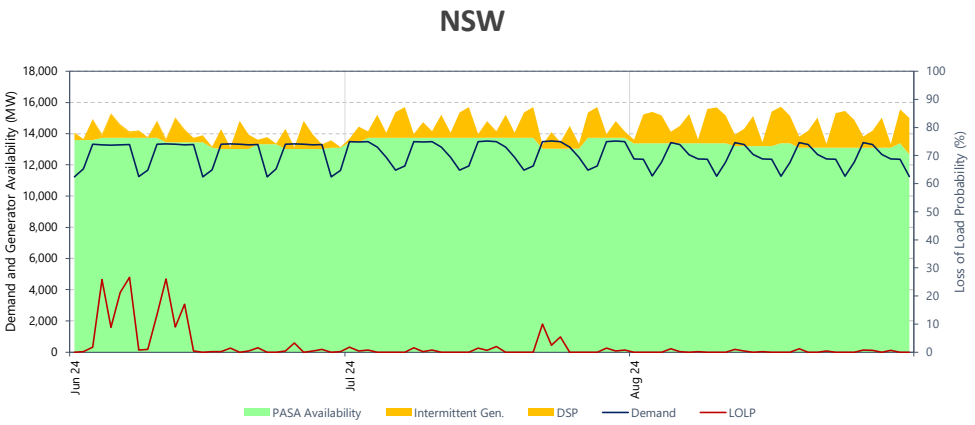
Operational demand

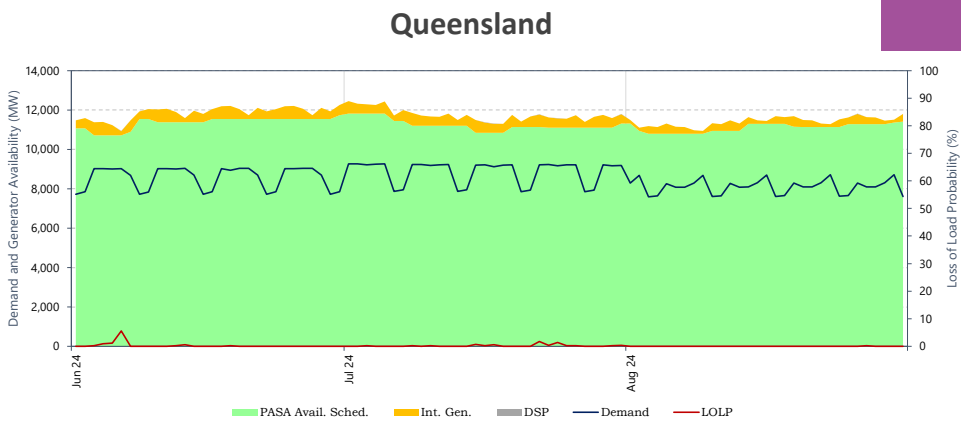


Region	Record Maximum Demand (MW)	Record Minimum Demand (MW)
NEM	35,796 (29/01/09)	11,009 (29/10/23)
NSW	14,744 (01/02/11)	3,719 (29/10/23)
QLD	11,005 (22/01/24)	3,131 (1/10/23)
SA	3,399 (31/01/11)	-26 (31/12/23)
VIC	10,576 (29/01/09)	1,564 (31/12/23)
TAS	1,790 (21/07/08)	732 (21/03/13)

- Demand is highly weather dependent and cold snaps have the potential to drive electricity demands higher, particularly in the NSW region.
- Historically minimum record demands occurred during shoulder seasons except the most recent records for South Australia and Victoria in December 2023. Low demand periods in Winter 2024 are more likely to occur during weekends and public holidays.

Loss of load probability study





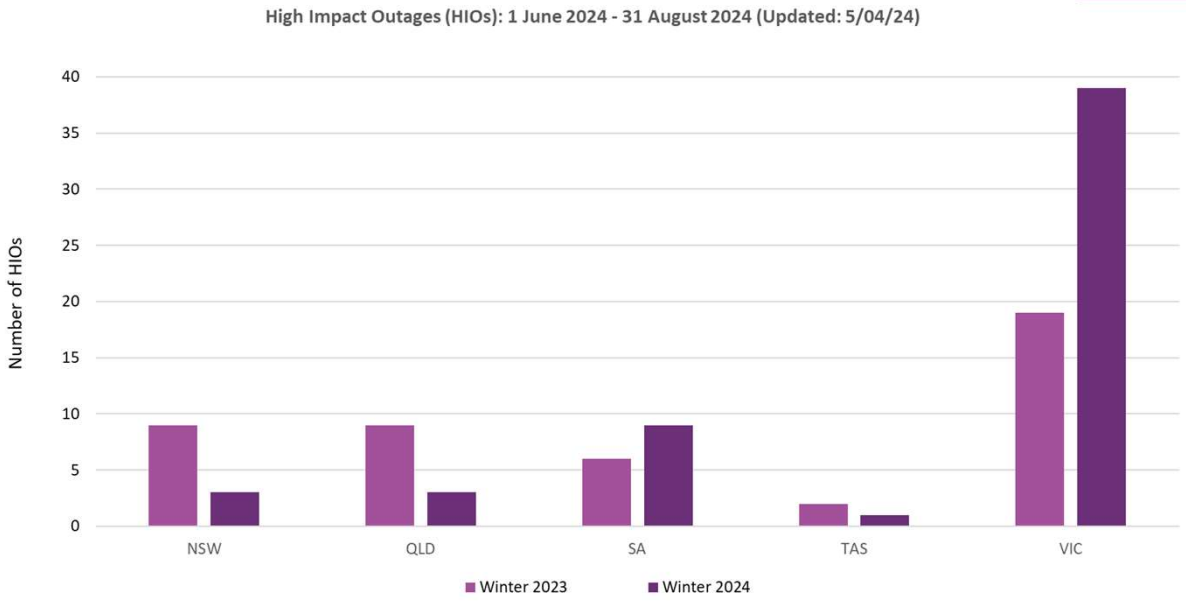
- Risk of load shedding is low in all regions as indicated by Loss of Load Probability Study (LOLP).
- The study shows a low number of days with low LOLP in New South Wales and Queensland regions.
  Victoria, Tasmania and South Australia have no LOLP periods during Winter and for that reason no charts are provided.
- Electricity Statement of Opportunities (ESOO) update is expected to be published in May 2024. There are delays to some network and generation projects (e.g. Project EnergyConnect Stage 1). Although there are no major impacts on reliability for Winter 2024 (also included in LOLP charts above), ESOO will highlight any potential long-term impacts.

Note: MTPASA Run 805 (16 April 2024),
Period shown: 1 June 2024 to 31 August 2024.

High impact outages and augmentations

- Number of planned HIOs are at similar or reduced levels (compared to previous Winter) for all regions except VIC with significantly higher outages driven by project works
- QLD: maintenance/commissioning of Nebo – Strathmore (June), Strathmore - Ross (August) 275kV line and Haughton River no 2 275kV bus (August)
- NSW: maintenance/commissioning of Liddell – Muswellbrook 330kV line
- VIC: project / maintenance activities impacting Hazelwood – Rowville 500kV, Haunted Gully – Tarrone, Heywood – Mortlake, Moorabool – Haunted Gully and Moorabool – Mortlake 500kV lines, Kerang – Wemen and Red Cliffs – Wemen 220kV lines
- SA: maintenance of Tailem Bend – South East (June), Tailem Bend – Tungkillo (June and August), Heywood – South East (July) 275kV lines. Murraylink in July and Aug
- TAS: maintenance of Sheffield – Farrell 220kV lines in June

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



Inter-regional augmentations on QNI:

- Possible 50 MW increase from NSW to QLD in Winter 2024 (Currently at 850 MW).
- Possible 100 MW increase from QLD to NSW in Winter 2024 (Currently at 1300 MW).

Basslink:

- Possibility of dynamic capacity increases (for short periods only) when monitored by Cable Loading Prediction System (CLPS).

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

Reliability Emergency Reserve Trader (RERT)

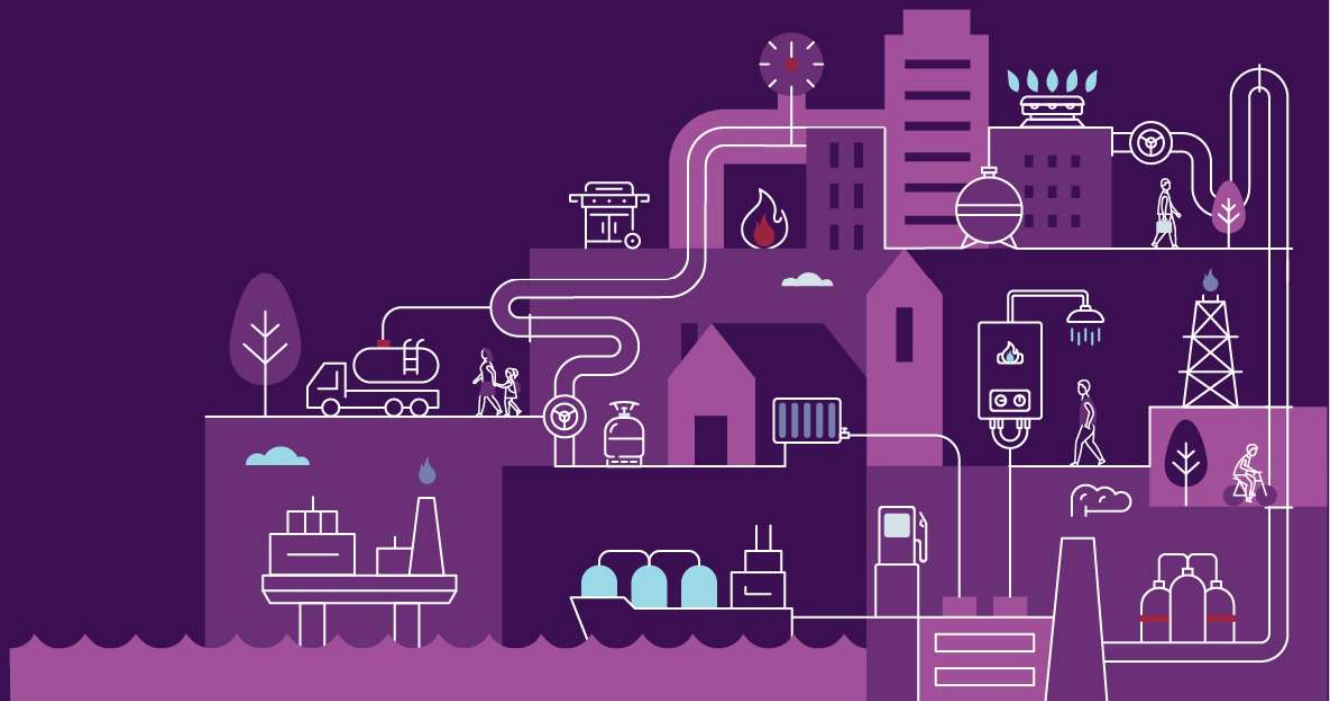
- To mitigate any potential reliability risks AEMO maintains a panel of suppliers that can provide / contract reserves at short notice – the short notice RERT panel.
- Short notice RERT costs are only incurred if reserves are pre-activated or activated, as such reserves are not guaranteed to be available.
- 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.
- During Winter 2022 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.
- Contracted / activated RERT amount is published on AEMO website post-event.

Network and generation risks

Risks	Mitigation
Network and generation forced outages exceeding limits historically observed.	• More VRE / BESS capacity and synchronous generation (2500 MW) is expected to be available in the NEM due to return to service of major coal plant and reduced maintenance activities. • Ensuring regular maintenance activities are carried out and risks identified early. AEMO is monitoring network and generation availability across all regions. • RERT Panel: Short Notice RERT.
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, industrial action(s) or other reasons. • Risk managed through ACCC interim authorisation maintenance co-ordination for NEM regions. • New MT PASA interface with information on generating unit status and recall times.
Storms / flash flooding impacting coal supply and transmission in the NEM.	• BOM is predicting median / below median rainfall across majority of the country. • Contingency management framework / plans. • Contracting coal from diverse sources and building up coal stock. • Monitor coal generation availability and stockpile levels.
Cold snaps / unplanned generation outages resulting in elevated / co-incident demand for gas consumption and GPG, reducing availability of GPG.	• Availability of scheduled generation has improved in the NEM. • Signal to industry if there is a forecast shortfall. • AEMO directions to increase gas supply from Queensland, utilisation of LNG storages. • Coordinated response with NEM to respond to possible gas generation fuel supply shortfall. • Switching to alternative fuel source (diesel). • RERT Panel: Short Notice RERT.
Unplanned network events including during high/low demand periods.	• Contingency management framework / plans. • Minimum demand framework.

ECGS Functions and Obligations

East Coast Gas System (ECGS)



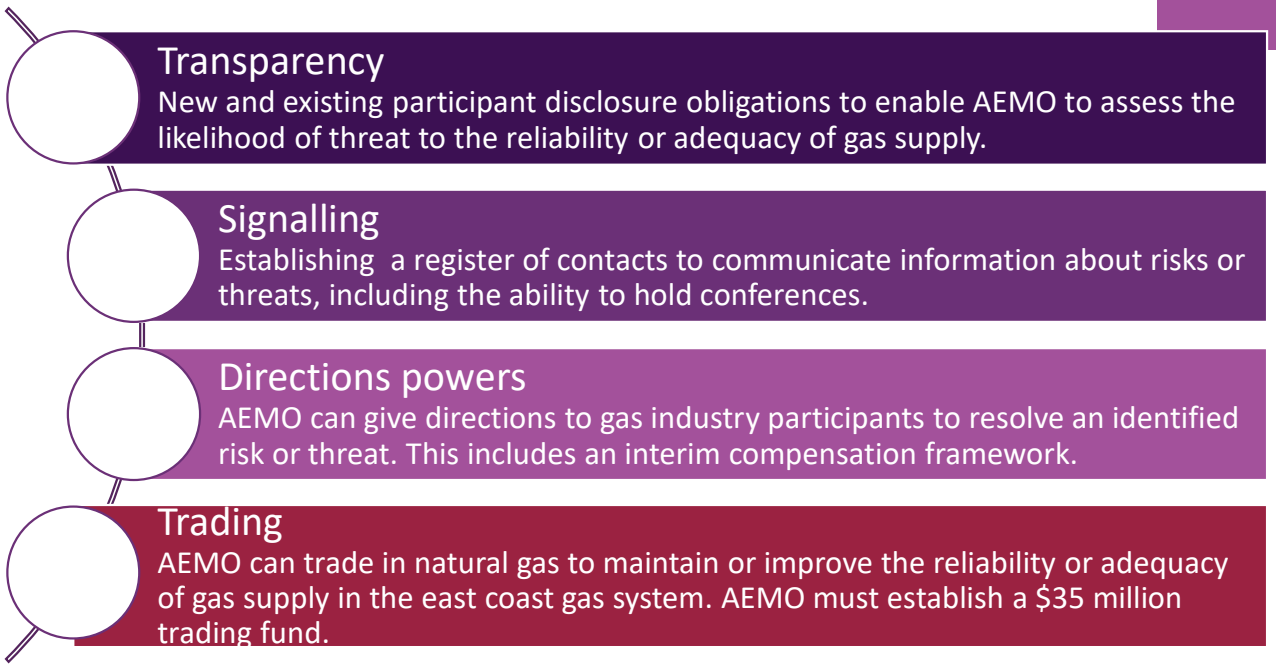
Recap – Timeline Part 27 Implementation – the journey so far…

Date	Event
8 June 2022	Energy Ministers agreed to task AEMO to provide an urgent update on the east coast gas supply and demand situation, including identification of any market constraints and provide advice to Energy Ministers on any actions Energy Ministers and the Commonwealth may need to take to address these issues
12 August 2022	Energy Ministers agreed to take a range of actions to support a more secure, resilient and flexible east coast gas market
27 April 2023	Bill giving effect to amendments to the National Gas Law commenced
4 May 2023	Corresponding National Gas Regulations and National Gas Rules amendments came into effect
1 June 2023	Effective Date of East Coast Gas System Procedures
27 June 2023	Effective Date of East Coast Gas System Guideline
4 July 2023	Reporting obligations for Part 27 East Coast Gas System Reforms commenced

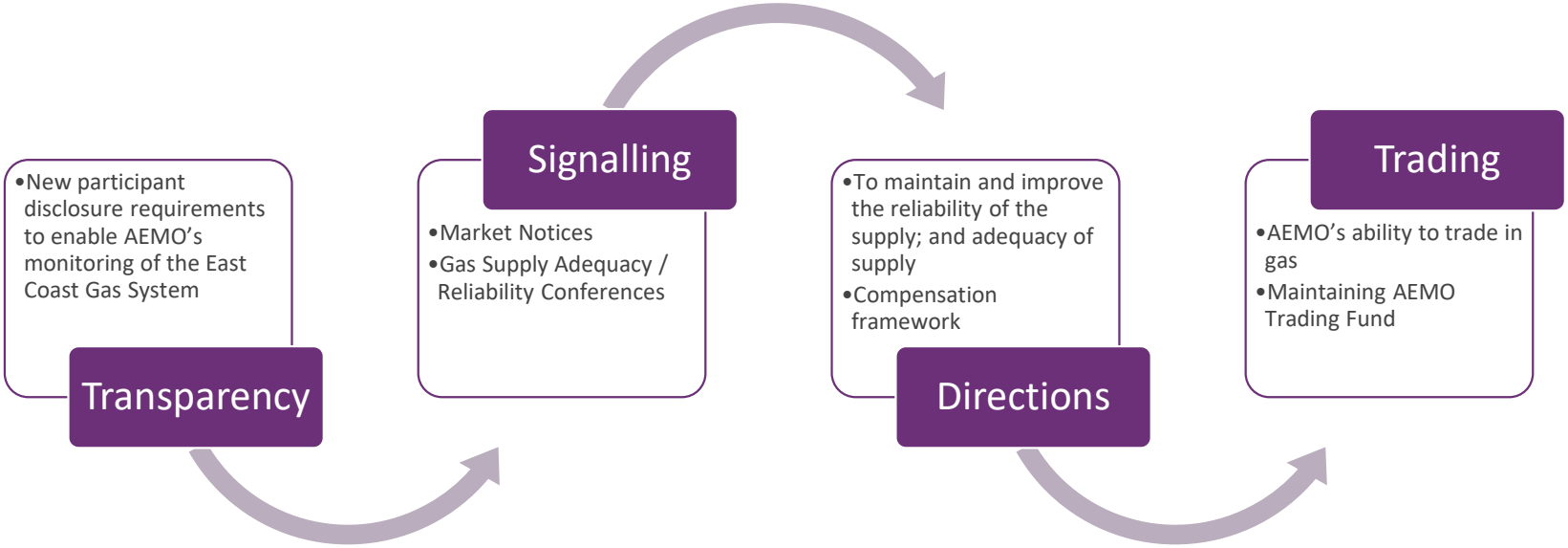
AEMO's east coast gas system reliability and supply adequacy functions

AEMO is required to monitor threats to east coast gas supply and respond to minimise risk.

- Extends across all Jurisdictions excluding Western Australia
- Applies to gas industry facilities, regulated gas markets and gas trading exchanges administered by AEMO
- Monitor to identify risks and threats to supply adequacy and reliability
- Minimise supply adequacy/reliability risk by:
  - Signalling and informing relevant entities
  - Seeking industry-led responses
  - AEMO direction and/or trading
- Where alternative AEMO functions and powers such as STTM contingency gas or DWGM interventions are insufficient to mitigate the actual or potential risk or threat



ECGS functions



Transparency

Transparency

Register

- AEMO is required under Part 27 of the NGR to keep and maintain a register of relevant entities. However, AEMO may give a direction to a relevant entity whether or not it has been included on the Part 27 register.
- The register is used internally to send out automated notifications and to have up to date contact details
- AEMO publishes the register

Data Collection

- Data captured through:
  - Existing GBB submissions
  - Enhanced GBB submissions
  - New submissions (e.g., retailers)
- Data captured for:
  - Short term up to 1 week
  - Medium term 6 months to 2 years

Analysis and monitoring

- AEMO uses:
  - forecast demand
  - projected supply
  - storage levels
  - linepack
  - and other information

  to understand and forecast supply and demand balance
- AEMO's monitoring and assessments of the east coast gas system will assess the likelihood of a threat to the adequacy or reliability of gas supply

Signalling

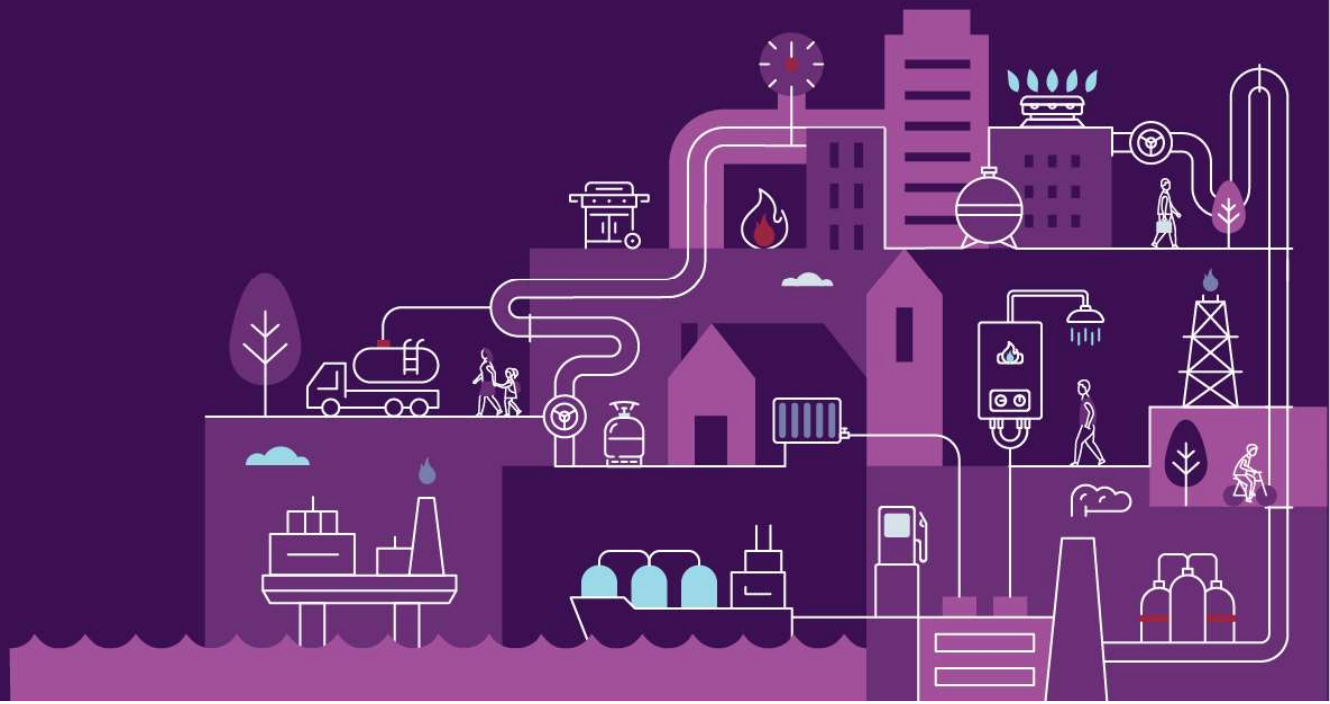
- Notices to be sent when AEMO identifies a potential or actual threat or calling for a conference or exercises its direction or trading function
- Notification to be sent out through SMS and email
- Notices can be sent to
  - Single relevant entity
  - Group of relevant entities based on type, location, or some other factor
  - All members of register
- Public notices are available on AEMO website
- AEMO may hold conferences for the exchange of information about matters impacting on gas supply and demand conditions as it relates to an identified risk or threat, including AEMO's assessment of
  - the likely duration and location of the risk or threat; and
  - the necessary response from industry to prevent or mitigate the risk or threat
- AEMO schedules, facilitates and chairs
- Conference meeting notes are available on AEMO website

Direction/trading

- If there is no material change in a risk or threat from an industry response, or if an emergency event occurs where there is insufficient time for industry to respond, then AEMO may need to use its direction or trading powers.
- AEMO may decide to give a direction if AEMO assesses that the existing market functions are unsuitable to resolve the issue
- NGR 697 / ECGS Procedure 3.2 & 3.3: Publication of Direction/Trading notices
- NGR 699: Matters to consider in determining whether to exercise direction function
- NGR 700: consider / consult with the relevant entity on the nature, timing or circumstances of giving the proposed direction
- Rule 697 (2) (b), ability to give direction notice even when no previous threat notice issues.
- NGR 699 (c): minimise distortionary impacts on the east coast gas system and industry and consumer costs on which AEMO has available information should be, to the extent reasonably practicable
- NGR 699 (d): Safety should not be compromised
- Rule 700 (2), a direction notice is still valid even if AEMO fails to consult with entity.
- The best way to minimise distortionary impacts on the east coast gas system and industry and consumer costs is to have a market led response to a risk / threat. Directions/trading are last resort options available to AEMO

Overview of an ECGS Threat and AEMO Response

Queensland Gas Pipeline failure – from 5 March 2024



Agenda

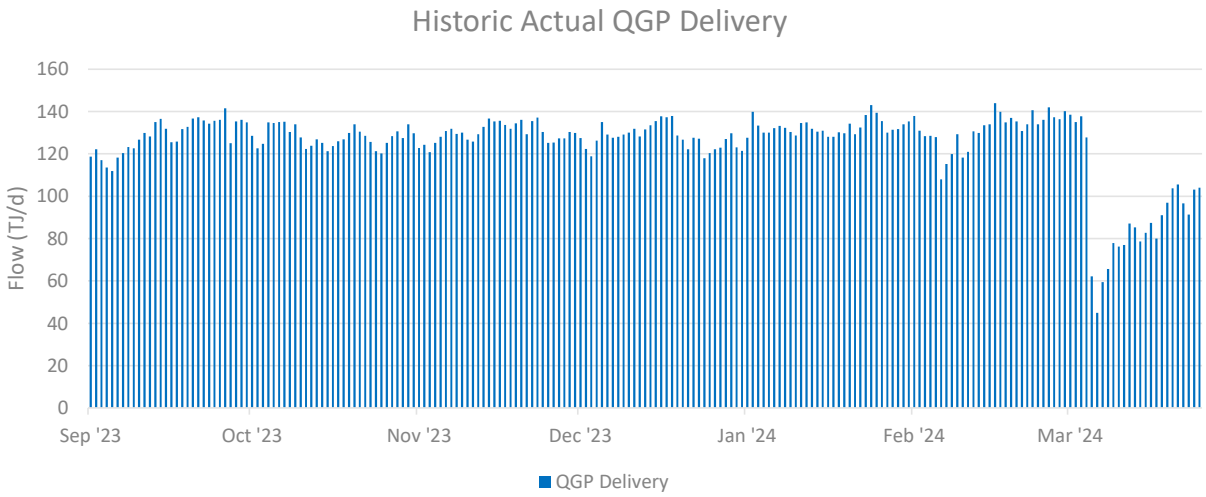
1. Queensland Gas Pipeline failure event 5 March
2. Identification of an ECGS risk or threat
3. Overview of the type of directions given in response to the event
4. Timeline of the AEMO response action

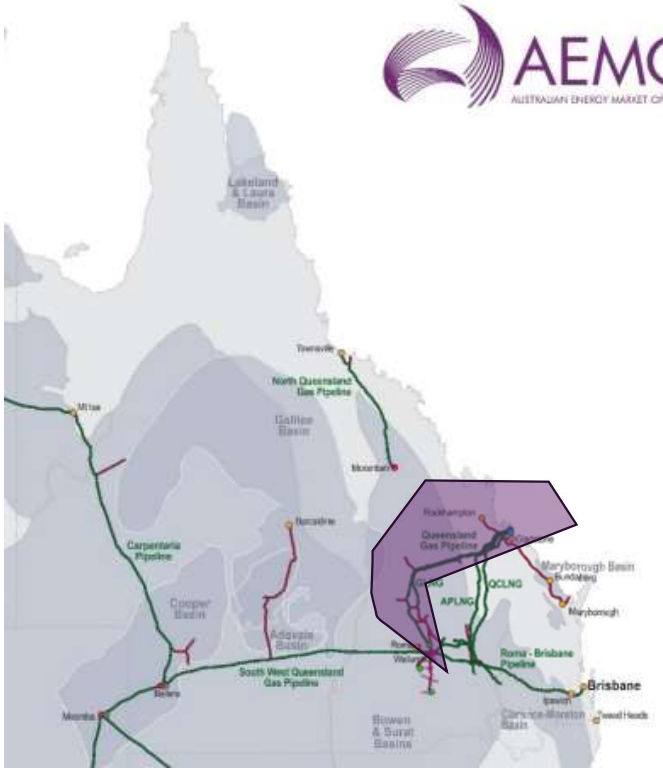
Information presented today relates to AEMO's response to the event between 5 and 19 March 2024. An active ECGS risk or threat notice is still in place and AEMO maintains directions related to the threat.

Queensland Gas Pipeline

Operator: Jemena Gas Pipeline
Nameplate: 145 TJ/d
Pipe Details: 627km, 10.2MPa
Typical utilisation: 90% (very high & steady)
Off-takers: domestic end users, predominantly transmission connected industrial customers

LNG Export facilities are not connected to the pipeline or its customers.





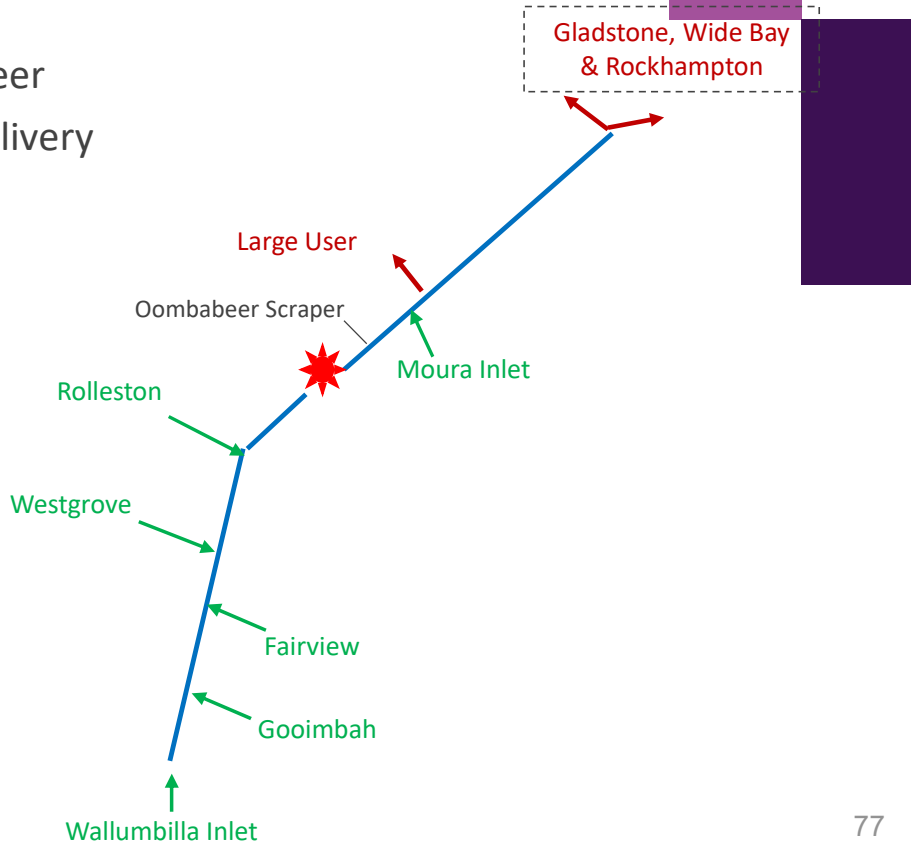
QGP 5 March failure event

Time / Date: 0725 on 5 March 2024

Failure event: uncontrolled release of gas.

Operator response: pipeline isolation between Rolleston CS and Oombabeer

Delivery connections upstream of Moura Inlet were disconnected from delivery connections down stream of Moura Inlet.



ECGS risk or threat

AEMO notification:

Operator Gas Bulletin Board Red Linepack/capacity adequacy flag

- Involuntary curtailment of 'firm' capacity is likely or happening; or
- Linepack has, or is forecast to, drop below minimum operating levels.

AEMO internal system triggered a push notification to AEMOs Gas Operations Teams and direct communication with the Operator commenced.

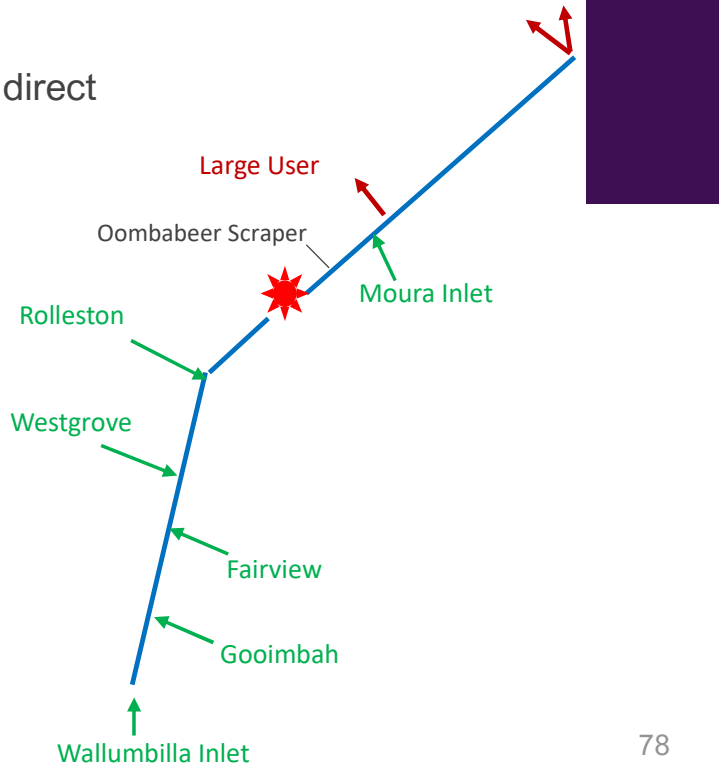
AEMO assessment of threat:

Forecast supply shortfall of approximately 90 TJ/d

Forecast shortfall satisfied the criteria for publication of ECGS risk or threat notice.

AEMO determined there was insufficient time to publish a notice before giving a direction

QGP Forecast Flows	06:00 Forecast (TJ/d)	Post Failure Forecast (TJ/d)
Forecast Delivery	**-128.0**	**-128.0**
Non-Distribution System	-127.0	-127.0
Distribution Systems	-1.0	-1.0
Forecast Receipt	**128.2**	**38**
Receipt Delivery Balance	**0.19**	**-90**



Directions to facilitate supply

Background: industry stakeholder responded to the threat by increasing supply at Moura Inlet up to the maximum quantity that could be transferred into the pipeline. AEMO engaged with the Queensland Government and consulted with industry stakeholders, and determined:

- there was a reasonable possibility that this response could change and supply into the QGP could be reduced;
- any reduction in supply was likely to have an immediate and severe consequence to gas users withdrawing from the pipeline.

Determining to give a direction:

- AEMO considered the principles listed in NGR 699 and determined that the giving of direction may have distortionary impacts on consumer costs and industry.
- AEMO concluded that the directions were necessary to reduce and mitigate the threat and given the nature, timing and circumstances, the risks of these distortionary impacts were as low as reasonably practicable.

Direction justification: AEMO determined that directions to maintain and improve the adequacy of supply into the QGP were necessary to mitigate the threat within the ECGS.

Directions: six directions were issued six relevant entities, to facilitate supply into the Moura Inlet.

Recipients: Producer, Supplier, Shipper, Facility Operators.

Notice of noncompliance: received on 7 March under NGR 702(1). AEMO consulted with the relevant entity and a direction was issued to achieve the intent of the original direction.

Directions to curtail

Background: AEMO was advised that if the pipeline operator curtailment regime, based on individually agreed Gas Transportation Contracts, was implemented it would likely result in severe and major consequences for some gas users that are supplied from the pipeline. If Jemena deviated from what was agreed with its customers, it would have been a breach of contract.

AEMO engaged with the Queensland Government and consulted with industry stakeholders, and determined:

- after receipt connections received maximum quantities, there would be inadequate supply to meet demand
- an alternate, risk informed supply allocation methodology could better allocate supply in a manner that managed risk to an ALARP level
- there was insufficient time for the Queensland Government to implement curtailment via emergency powers

Determining to give a direction: AEMO considered the principles listed in NGR 699 and determined that directions related to the implementation of curtailment of demand were necessary to mitigate the threat.

Directions to curtail

Directions to curtail given between 5 to 8 March

Directions:

- twenty-five (25) directions to six relevant entities,
- to cease all gas withdrawals until advised by AEMO, or to reduce to the minimum quantity possible without causing major damage to plant and equipment or threaten health and safety.

Recipients: Registered participant – Large User

Directions to implement curtailment given between 8 to 19 March

Background:

- a connection was established at Moura Inlet and supply into the QGP was increased in stages through to gas day 8 March. AEMO determined it could minimise its intervention by replacing directions to Large Users, with a direction to the pipeline operator that ensured a minimum quantity of supply to withdrawal connections to mitigate the threat while also providing a pathway for existing market mechanisms and agreements to determine the allocation of available supply above a minimum allocation quantity.
- AEMO and participants undertook efforts to remove AEMO's curtailment related directions in their entirety, however it was determined this could not be achieved without significant risk to some gas users withdrawing from the QGP.

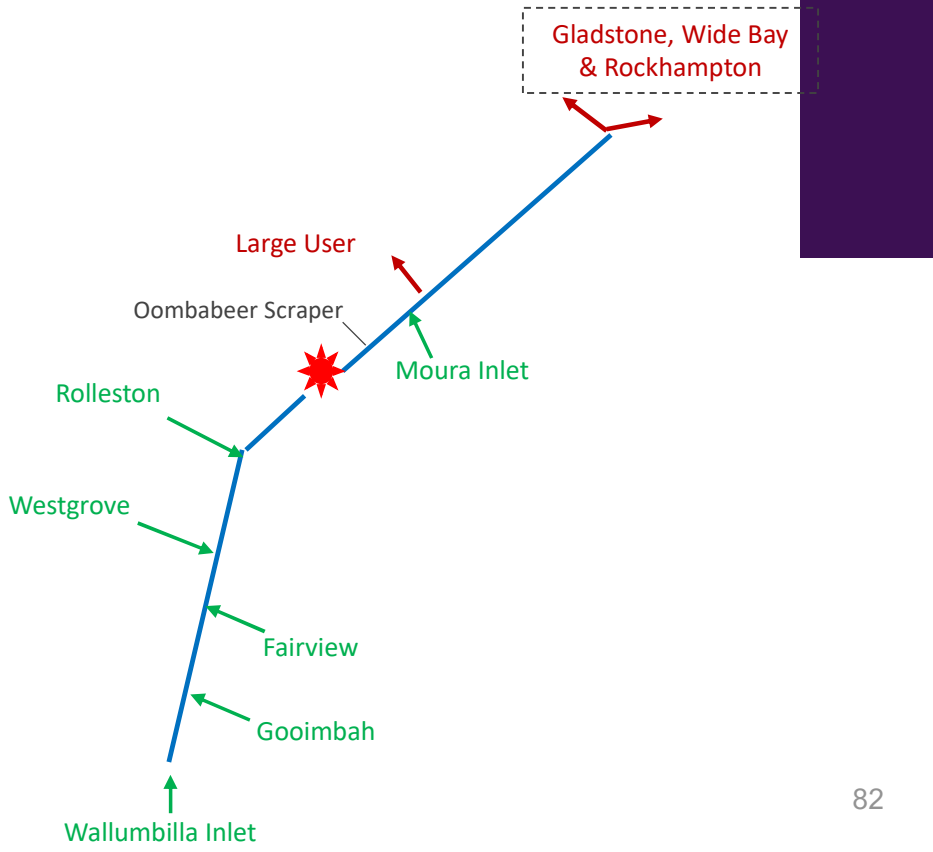
Directions: three directions related to the implementation of curtailment.

Recipients: Pipeline Operator

AEMO response on 5 March

AEMO response overview:

- Engage with Queensland Government and consult with Industry stakeholders
- Direct to facilitate supply
- Signal threat to Market via ECGS Risk or Threat Notice
- Give notification that the direction function has been exercised
- Convene an Industry Conference to communicate the threat to industry
- Direct to curtail



Significant response events & decisions

0725:	Approximate rupture event start time
1308:	ECGS Direction given to facilitate supply
1402:	Direction & Threat Notice issued
1630:	Industry Conference convened
1930:	Curtailment Directions given

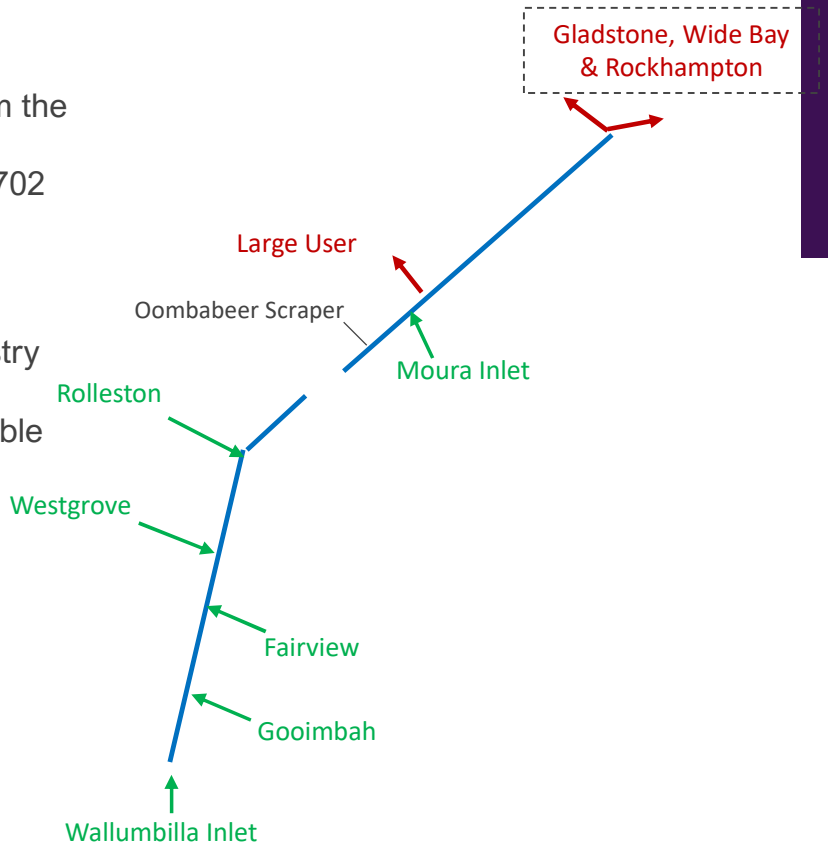
AEMO response from 6 to 7 March

Event updates:

- Gas consumption required to mitigate risks evolve as the duration of the supply interruption extends
- Supply increased in stages across the period, including the transfer in of supply from the GLNG Transmission pipeline into the QGP
- AEMO receive a notice of noncompliance with a direction as permitted under NGR 702 (1)

AEMO response overview:

- Ongoing engagement with the Queensland Government and consultation with industry
- Convene Industry Conferences to communicate information relevant to the event
- Give curtailment direction variation/s as the demand requirement evolves and available supply increases



AEMO response 8 March

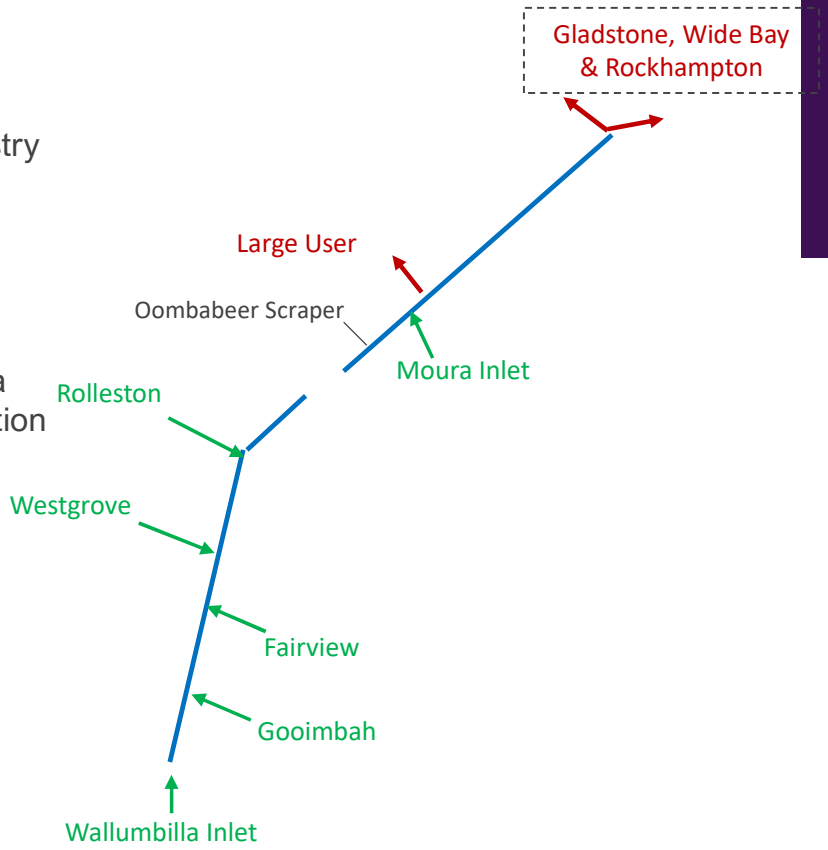
Event updates:

- Pipeline delivery capacity increased to 83 TJ/d

AEMO response overview:

- Ongoing engagement with the Queensland Government and consultation with industry
- Convene Industry Conference
- Give directions to facilitate supply in response to the notice of noncompliance
- Re-structure curtailment of supply directions:
  - ➢ Give direction to the pipeline operator related to the implementation of curtailments

  AEMO reduced its intervention by replacing directions to Large Users to provide a pathway for existing market mechanisms and agreements to determine the allocation of available supply above a minimum allocation quantity



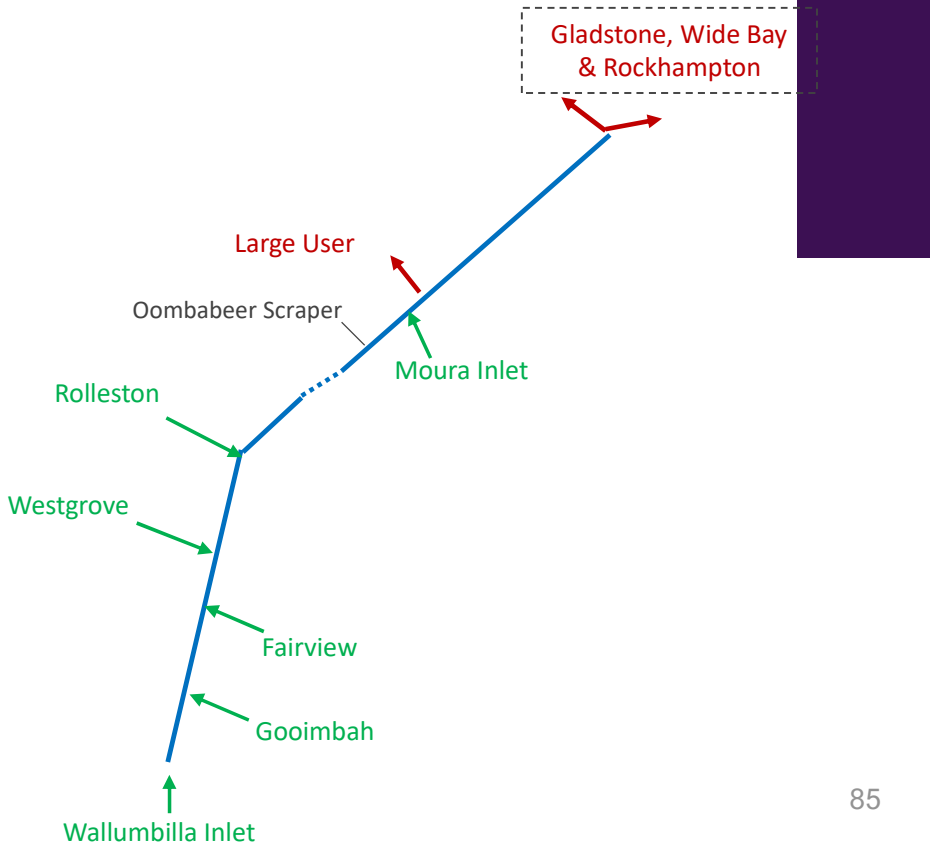
AEMO response 16 to 19 March

Event updates:

- AEMO and participants undertook efforts to remove AEMO's curtailment related directions in their entirety, however it was determined this could not be achieved without significant risk to some gas users withdrawing from the QGP
- Pipeline operation recommenced at a reduced operating pressure
- QGP delivery capacity constrained by restricted operating pressure

AEMO response overview:

- Ongoing engagement with the Queensland Government and consultation with industry
- Give a direction to implement curtailment to further reduce AEMOs intervention
- Revoke directions related to facilitating supply following de-isolation of the pipeline



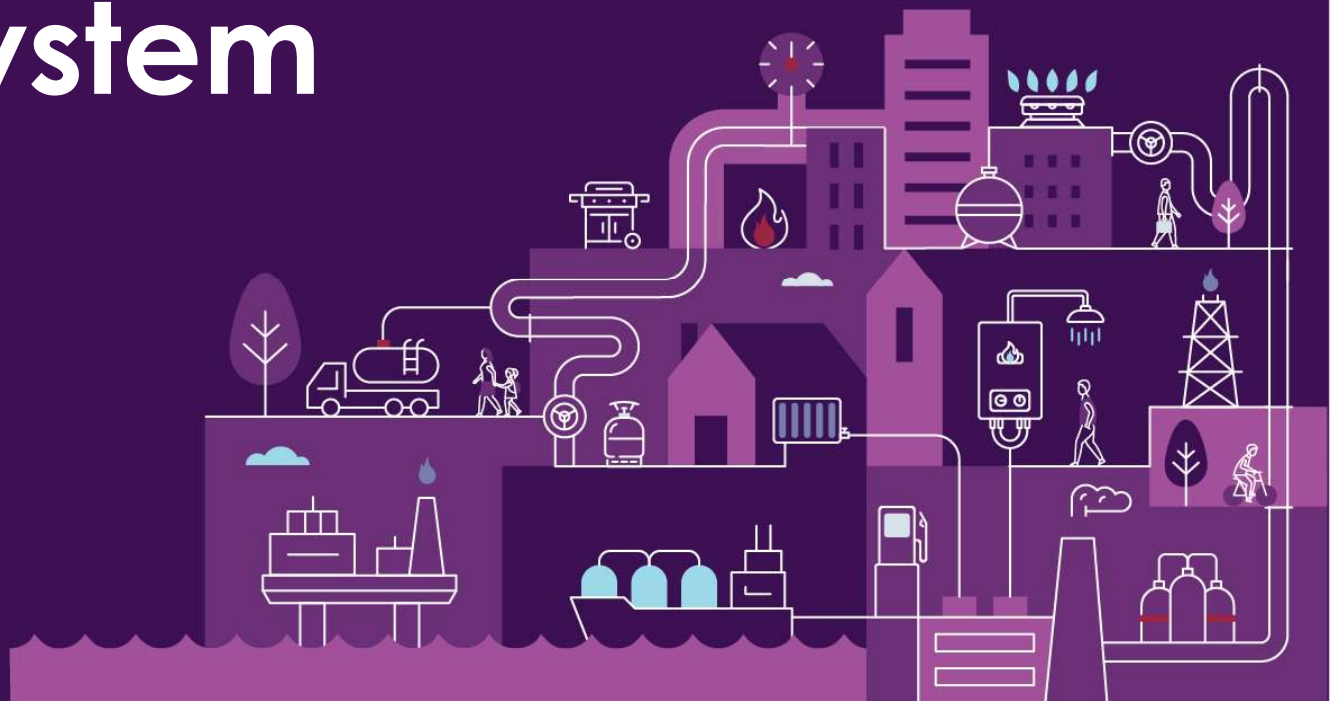
Key points

- Threat identified from Industry supplied information and communicated to industry via ECGS threat notice and Industry teleconference/s
- AEMO engaged the Queensland Government and consulted with industry throughout
- AEMO determined that directions were necessary to maintain or improve the adequacy of supply into the QGP were necessary to mitigate the threat within the ECGS
- Directions related to:
  - Facilitate supply into the QGP
  - Curtailment
- The ECGS threat remains active and AEMO maintains a direction related to the threat

Preliminary Post Intervention Report:
https://aemo.com.au/energy-systems/gas/east-coast-gas-system/ecgs-reports-and-notices

Responding to risks or threats to the East Coast Gas System

AEMO
AUSTRALIAN ENERGY MARKET OPERATOR



Why AEMO responds to risks or threats

AEMO may need to respond to a risk or threat to the DTS, STTM hubs, or East Coast Gas System

AEMO may need to utilise one of the available response mechanisms to meet our obligations under the relevant National Gas Laws (NGL) or National Gas Rules (NGR)[1].

Broadly, these obligations may relate to maintaining:

- System adequacy[2]
- System reliability[3]
- Gas or system specifications
- Safety

1: There is additional legislation for Victoria which is applicable during emergencies, refer to Appendix B.
2: Adequacy is a measure of the system's ability to satisfy gas demand.
3: Reliability is a measure of the system's ability to respond to unexpected or changing system conditions. Examples may include capacity constraints, unplanned changes in supply or demand forecasts, etc.

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Available response mechanisms

Contingency Gas

Contingency Gas (CG) is used to minimise the likelihood of curtailment of shippers at STTM hubs due to transient or localised events within the hubs.

- Triggered when there is an **inability of supply to meet demand** at a STTM
- Bids and offers are made by the market participants to resolve the supply imbalance
- Most effective when used for short time periods (a shortfall during an evening peak, an unplanned pipeline outage for a gas day, etc)
- **If at any stage there is to be material involuntary curtailment of customers, the CG process ends**
- Specific information can be found in the STTM Procedures

Contingency gas trigger event

(1) Each of the following events is a contingency gas trigger event:

(a) a forecast of pressure conditions under or over acceptable operating levels at a hub or custody transfer point; and

(b) a forecast inability of an STTM facility to meet the normal seasonal levels of daily delivery capacity to the hub; and

(c) an event upstream of an STTM distribution system that could reasonably be expected to adversely affect the supply of natural gas to that STTM distribution system; and

(d) AEMO issues an ex ante market schedule or a provisional schedule for a hub for a gas day which indicates that price taker bids will not be fully scheduled due to inadequate supply of natural gas to that hub on that gas day.

Note:

The occurrence of a contingency gas trigger event requires AEMO to commence a consultation process to determine whether to call for the provision of contingency gas at that hub on a gas day, but may not necessarily require AEMO to schedule contingency gas.

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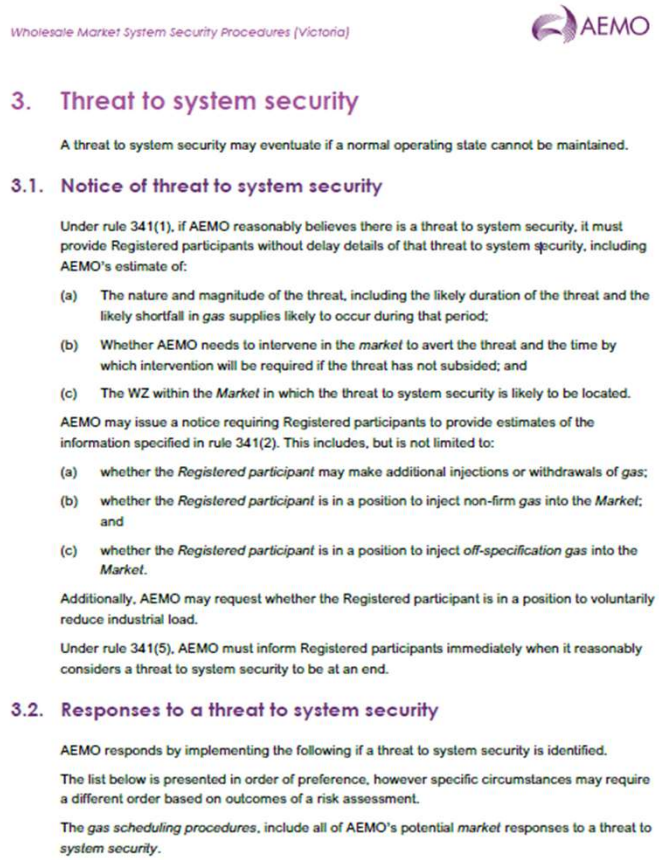
Threats to System Security

When responding to threats to system security (TTSS), AEMO has multiple intervention options (unlike CG) but must comply with extensive procedural and NGR requirements.

- Only applicable to the management of threats within the **declared transmission system**
- Triggered when there is an event which could contravene the security or gas quality requirements of the Wholesale Market System Security Procedures
- Where possible, registered/market participants are expected to resolve the threat without AEMO's intervention
- AEMO may **intervene** if necessary (increasing withdrawals, directing non-firm gas injections, directing off spec gas injections, ad hoc scheduling, curtailment)



Wholesale Market System Security Procedures (Victoria)

AEMO

3. Threat to system security

A threat to system security may eventuate if a normal operating state cannot be maintained.

3.1. Notice of threat to system security

Under rule 341(1), if AEMO reasonably believes there is a threat to system security, it must provide Registered participants without delay details of that threat to system security, including AEMO's estimate of:

(a) The nature and magnitude of the threat, including the likely duration of the threat and the likely shortfall in *gas* supplies likely to occur during that period;

(b) Whether AEMO needs to intervene in the *market* to avert the threat and the time by which intervention will be required if the threat has not subsided; and

(c) The WZ within the *Market* in which the threat to system security is likely to be located.

AEMO may issue a notice requiring Registered participants to provide estimates of the information specified in rule 341(2). This includes, but is not limited to:

(a) whether the *Registered participant* may make additional injections or withdrawals of *gas*;

(b) whether the *Registered participant* is in a position to inject non-firm *gas* into the *Market*; and

(c) whether the *Registered participant* is in a position to inject *off-specification gas* into the *Market*.

Additionally, AEMO may request whether the Registered participant is in a position to voluntarily reduce industrial load.

Under rule 341(5), AEMO must inform Registered participants immediately when it reasonably considers a threat to system security to be at an end.

3.2. Responses to a threat to system security

AEMO responds by implementing the following if a threat to system security is identified.

The list below is presented in order of preference, however specific circumstances may require a different order based on outcomes of a risk assessment.

The *gas scheduling procedures*, include all of AEMO's potential *market* responses to a threat to *system security*.

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East Coast Gas System (ECGS) Directions

ECGS directions are the broadest in potential scope and currently are not anchored to a reliability standard. AEMO will use existing process where possible before directions.

- Applies to all East Coast jurisdictions
- Triggered when there is a **risk or threat** to the **reliability or adequacy** of the East Coast gas system
- The hierarchy of response includes:
  - Signalling and informing
  - Market-led responses
  - AEMO direction and or trading
- AEMO's ability to direct or trade in the market is broad and currently not anchored to a reliability standard
- **Where possible**, AEMO will use existing, familiar processes (CG, DTS intervention) to resolve risks or threats
- See the East Coast Gas System Procedures

91AD—AEMO's east coast gas system reliability and supply adequacy functions

(1) AEMO's east coast gas system reliability and supply adequacy functions are as follows:

(a) to monitor trends in the supply of, and demand for, natural gas in the east coast gas system and factors affecting, or that may potentially affect, the reliability or adequacy of the supply of gas within that system;

(b) to identify and communicate actual or potential risks or threats to the reliability or adequacy of the supply of natural gas within the east coast gas system;

(c) to report to and advise the MCE, including a member of the MCE, on matters relating to the reliability or adequacy of the supply of natural gas within the east coast gas system;

(d) to publish information relating to the reliability or adequacy of the supply of natural gas within the east coast gas system;

(e) to give directions to relevant entities to the extent AEMO considers necessary to maintain and improve the reliability or adequacy of the supply of natural gas within the east coast gas system;

(f) to trade in natural gas or to purchase pipeline services or services provided by a compression service provider or a storage provider to the extent AEMO considers necessary to maintain and improve the reliability or adequacy of the supply of natural gas within the east coast gas system;

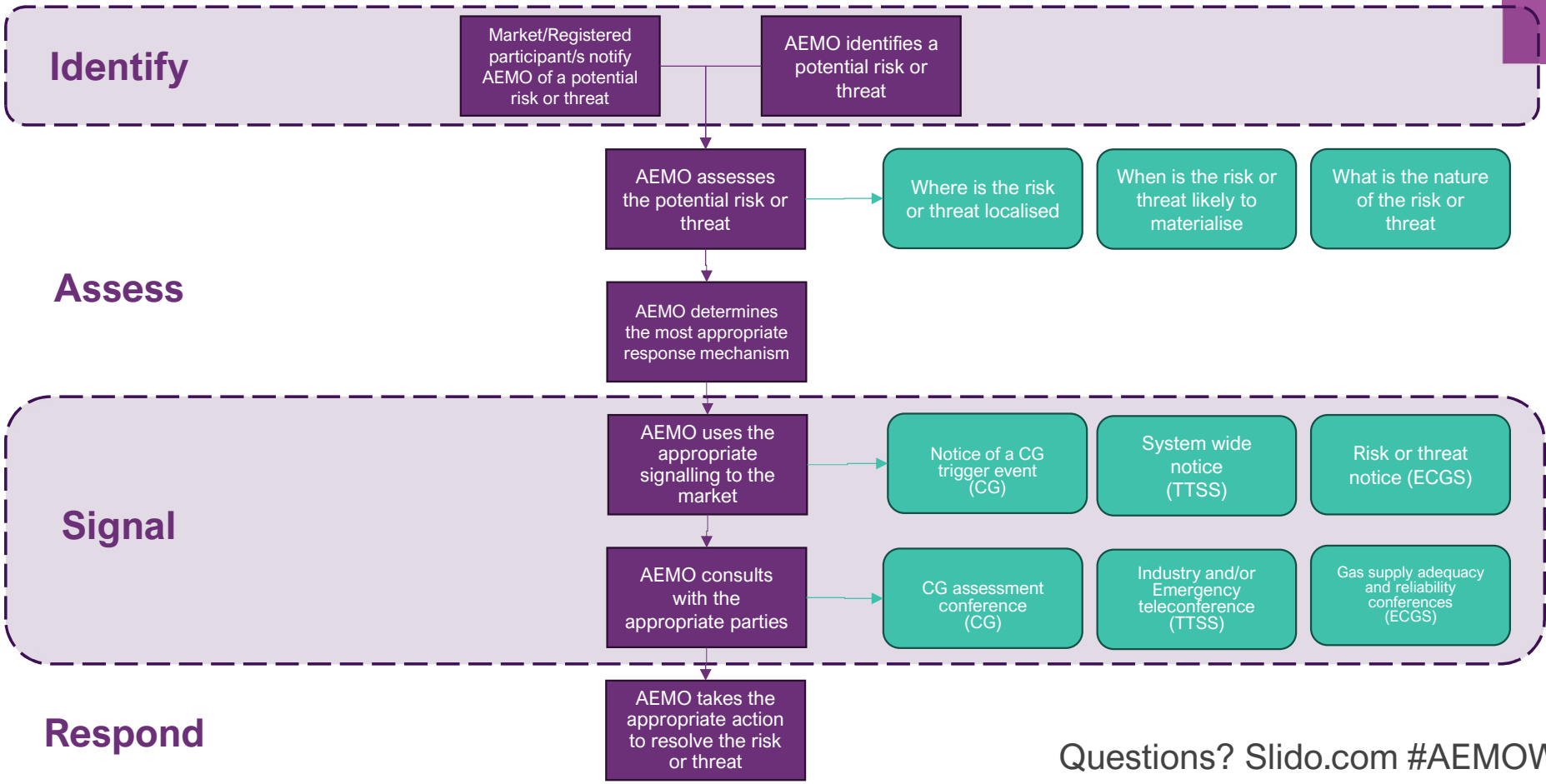
(g) other functions conferred on AEMO by the Rules for the purposes of this section;

(h) to make, amend or revoke Procedures (***East Coast Gas System Procedures***) relating to a function specified in paragraphs (a) to (g).

Questions? Slido.com #AEMOWinter2024

AEMO's approach

The flow path for each response mechanism is similar and consists of risk or threat identification, assessment, signalling and response.



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Using multiple response mechanisms

Utilising multiple response mechanisms

AEMO may use CG or TTSS as the initial response mechanism to mitigate immediate threats and use the ECGS function in parallel to elicit a sustained or broad market response to a threat.

- The ECGS Guidelines indicate that AEMO will utilise alternative functions/powers to address risks or threats where possible
- Improved outcomes may be achieved by combining a TTSS or CG response with an ECGS response:
  - Notification of threats and risks to participants outside the impacted areas which may improve the market led threat response
  - Direct, or request information from, relevant entities outside of Hubs and the DTS
  - Sustain longer term intervention/market correction

3.2. Additional market process

In addition to AEMO's *east coast gas system reliability and supply adequacy functions*, AEMO has other functions for the identification and response to supply and security issues in parts of the *east coast gas system* including:

(a) STTM contingency gas process that allows AEMO to publish an intraday schedule in response to a supply event that may develop into an *identified risk or threat*.

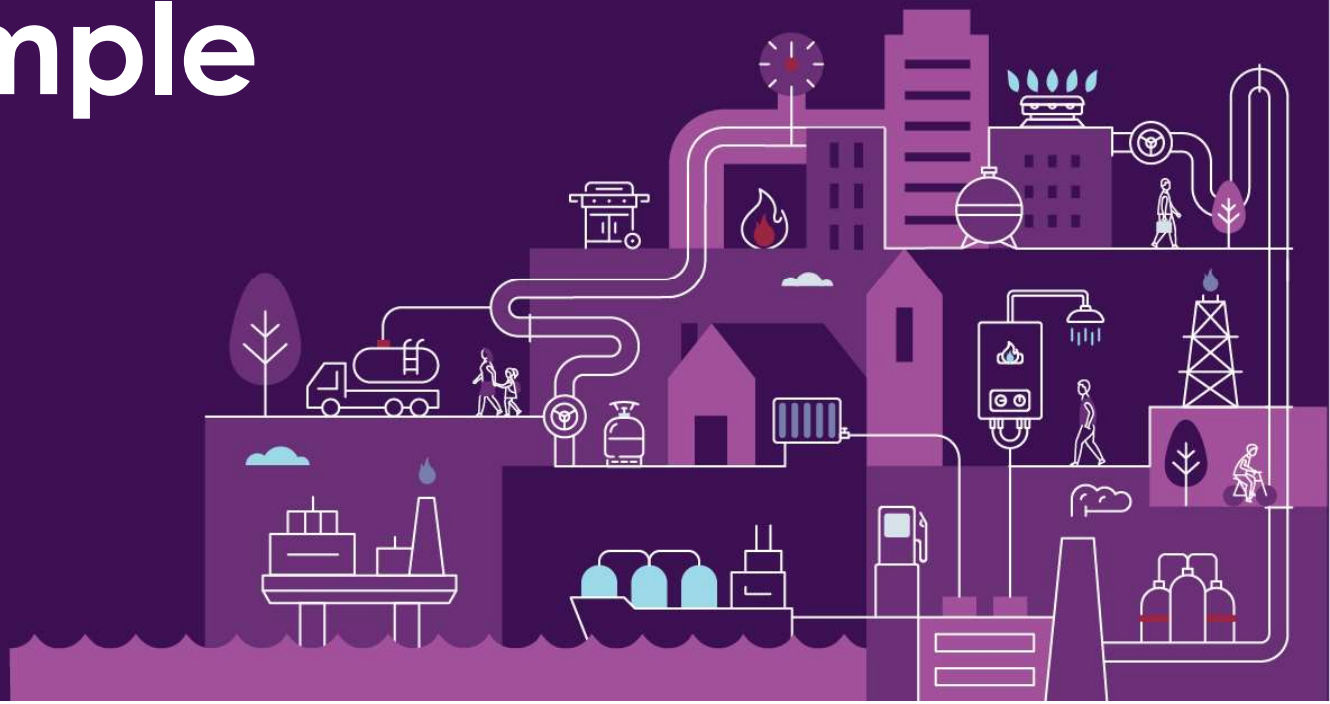
(b) DWGM threat to system security process which allows AEMO to undertake a variety of actions in response to a threat in the DWGM that may develop into an *identified risk or threat*.

Where AEMO determines that alternative AEMO functions are sufficient to communicate issues to industry and achieve the required response to mitigate these supply and security issues, AEMO may not issue a *risk or threat notice* and may not convene a *conference*.

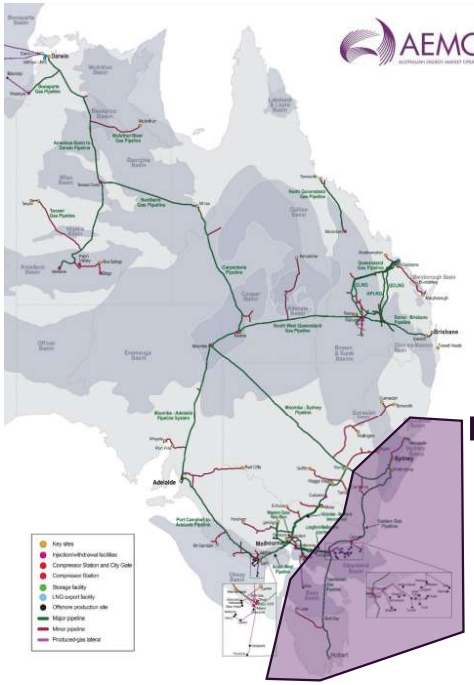
Questions? Slido.com #AEMOWinter2024

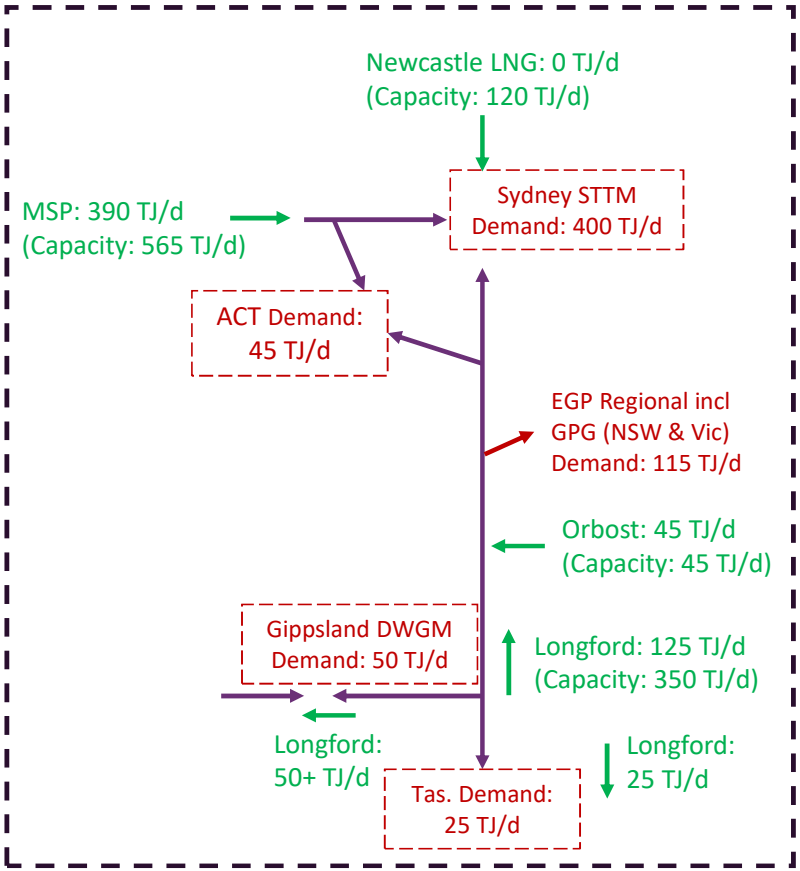
AEMO ECGS Response Worked Example

Winter Outlook 2024



Start of day forecast: 0600





Southeast Supply Demand Balance	Forecast (TJ/d)
Demand	**-635**
Sydney STTM	-400
ACT	-45
EGP Regional (NSW & Vic)	-115
DWGM: Gippsland	-50
Tasmania	-25
Supply	**635**
MSP	390
Newcastle LNG	0
Orbost	45
Longford	200
Supply Demand Balance	**0**

Supply adequacy threat event

Event:

- Longford Gas Plant supply reduced to 0 TJ/d for an extended undefined period
- Major reduction in gas supply for Victoria, Tasmania and Southeast New South Wales

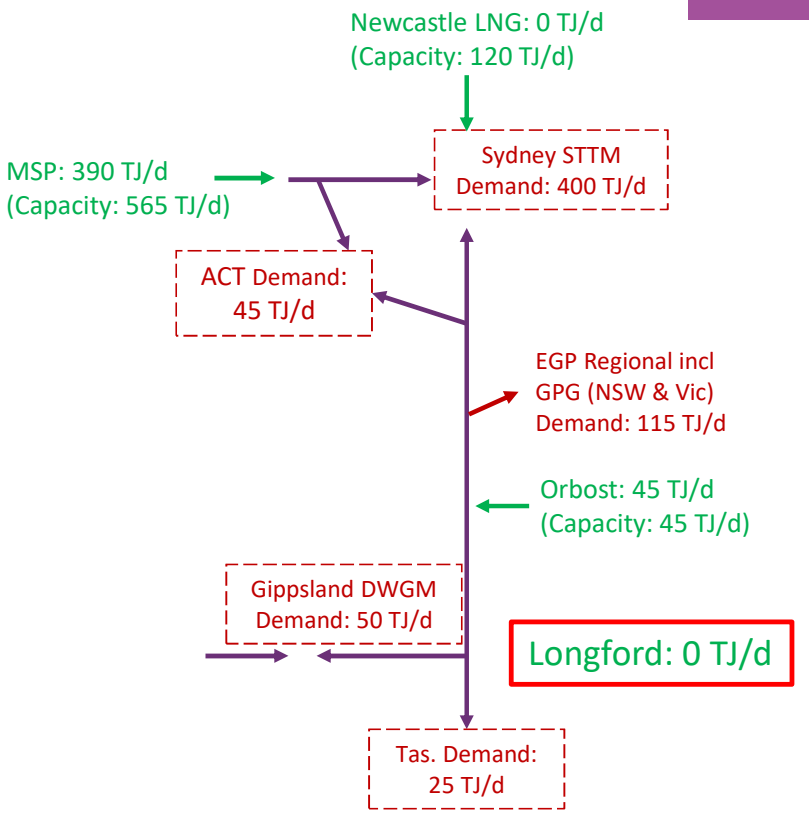
Event Impact:

Potentially insufficient supply to meet demand:

- Longford Melbourne Pipeline (Gippsland upstream of Gooding CS)
- Eastern Gas Pipeline
- Tasmanian Gas Pipeline

AEMO response mechanism options:

1. **DTS/DWGM Intervention:** Result is a Threat to System Security / Emergency as gas demand exceeds available supply
2. **Contingency Gas:** This is an event upstream of the Sydney STTM that could reasonably be expected to adversely affect the supply of gas to the STTM distribution system
3. **ECGS Risk or Threat: T**he supply of gas in part of the east coast gas system may be inadequate to meet demand



AEMO responses

	Communication	Immediate interventions
DWGM	DWGM Notices: 1. DWGM TTSS Notice: provide industry information relevant to the threat to the DWGM. 2. Activation of Emergency processes and preparation for mandatory restrictions	DWGM Intervention: 1. Ad hoc schedule / Directions: Increase supply from Port Campbell, DLNG and imports via Culcairn 2. Reduce demand: Cease exports out of DWGM, curtail GPG and large low priority gas users. Voluntary / mandatory restrictions via Victorian Govt / ESV
STTM	Contingency Gas Conference: 1. Communicate threat and seek CG for the Sydney STTM. 2. Notification of contingency gas requirement for current gas day	Contingency Gas: 1. Schedule Contingency Gas for current gas day Increasing supply to Sydney STTM via MSP and Newcastle LNG
ECGS	ECGS Notices: 1. ECGS Risk or Threat Notice: provide industry information relevant to the threat to the ECGS 2. AEMO holds an ECGS Assessment Conference and Industry Conference where time permits	ECGS intervention: 1. Engage with pipeline operators and jurisdictions to manage demand reduction, including GPG supplied from the EGP and TGP, as well as large users 2. Directions to divert Orbost gas to end users 3. Jurisdictions to initiate mass market gas rationing

AEMO will prioritise response actions to minimise the risk of involuntary curtailment. Notices will be issued & conferences held as soon as practicably possible.

AEMO response outcomes

Immediate response is expected to:

1. Increase Sydney STTM supply with Contingency Gas:
   - MSP and Newcastle LNG capacity utilised to increase supply, minimise EGP

2. Decrease demand:
   - Reduction in GPG demand on EGP and TGP
   - DWGM curtailment and call for voluntary reductions
   - Sydney STTM reduced demand (Contingency Gas may reduce demand)
   - ACT supply from MSP maximised, cease or minimise supply from EGP

Remaining supply demand shortfall: -55 TJ/d

There remains insufficient supply to meet demand:

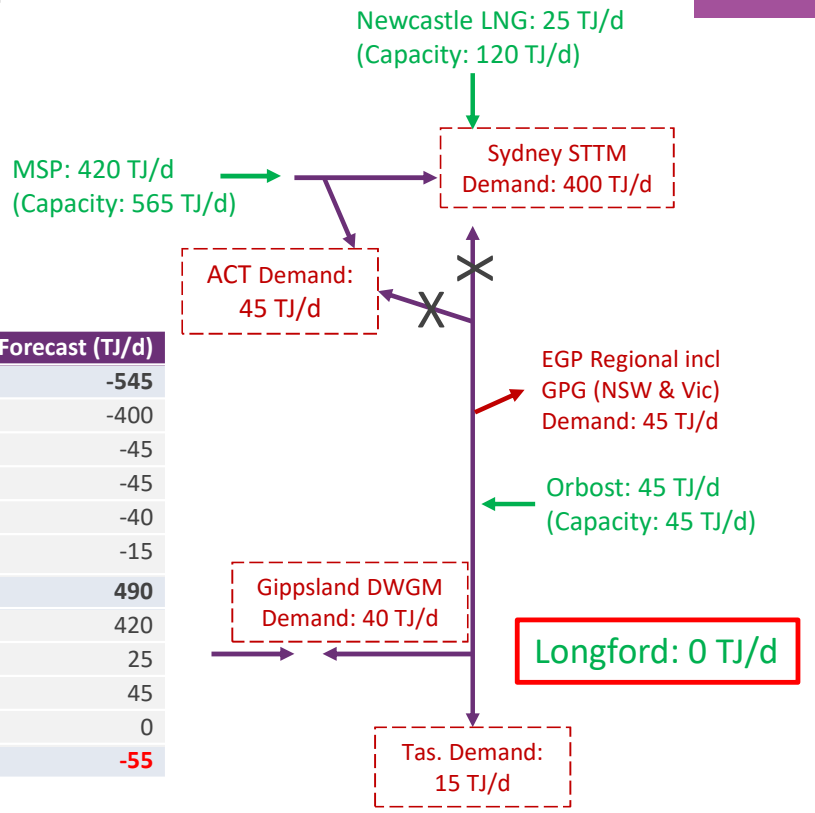
- Tasmanian shortfall: estimate 15 TJ/d
- Gippsland region of Victoria: estimate 40 TJ/d
- EGP connected regions of NSW: 45 TJ/d

Note: Shortfall varies with weather

AEMO ECGS Directions likely to be used to:

- Divert Orbost supply shortfall region
- Curtail large user demand in shortfall region

Supply Demand Balance	Forecast (TJ/d)
Demand	**-545**
Sydney STTM	-400
ACT	-45
EGP Regional (NSW & Vic)	-45
DWGM: Gippsland	-40
Tasmania	-15
Supply	**490**
MSP	420
Newcastle LNG	25
Orbost	45
Longford	0
Supply Demand Balance	**-55**



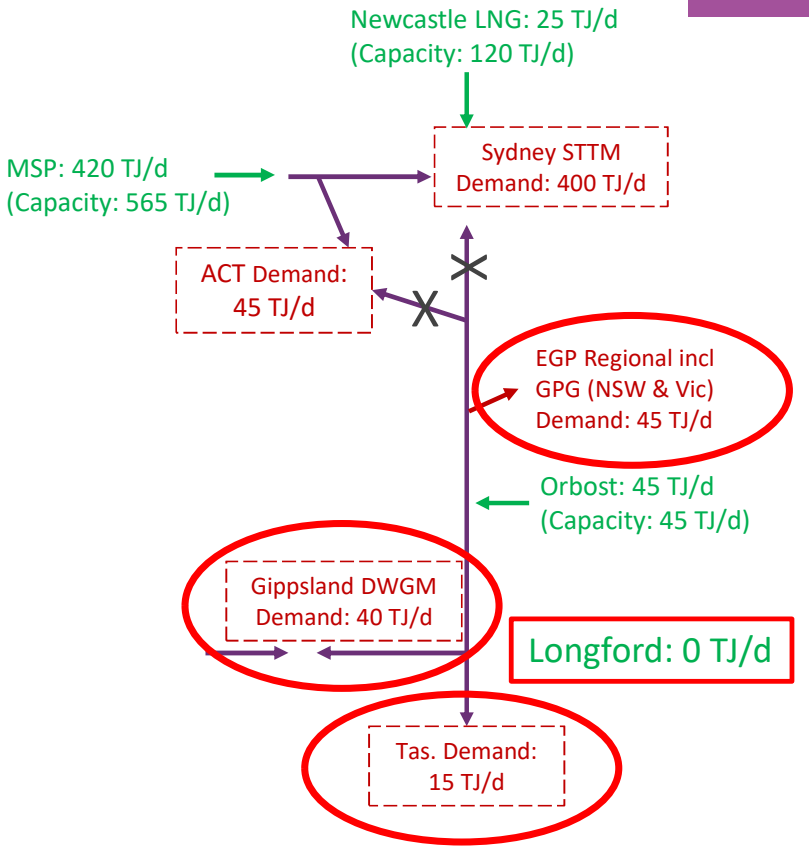
Managing insufficient supply

NGERAC process for managing available gas supply

- AEMO communicates the threat and consults with impacted Jurisdictions, individually and via NGERAC
- NGERAC reviews requirements for supply to maintain essential services and maintain minimum pressures
- NGERAC considers options to relieve the impacted jurisdictions

Response options that involve intervention in the Market may be implemented by:

- AEMO via its ECGS and DWGM functions; and
- Jurisdictions through the activation of Emergency Powers



Emergency Procedures (Gas) – Refresher

Winter Presentation - 2024

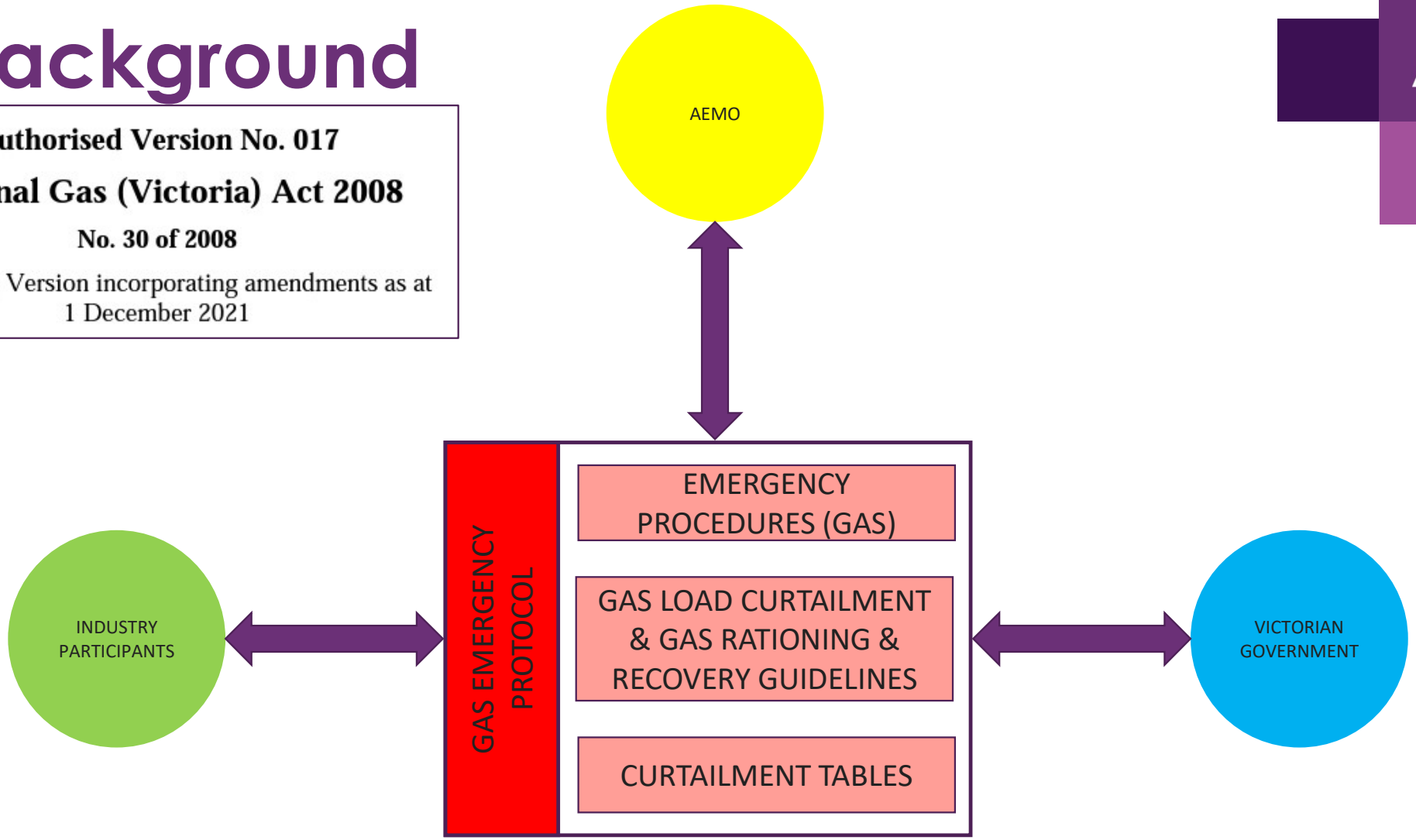
Background

Authorised Version No. 017

National Gas (Victoria) Act 2008

No. 30 of 2008

Authorised Version incorporating amendments as at 1 December 2021



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53 Gas emergency protocol

S. 53 inserted by No. 23/2009 s. 20.

(1) Subject to this Division, AEMO must make and keep up to date a protocol (a ***gas emergency protocol***) that—

(a) classifies gas emergencies into categories having regard to their scale, effect, or any other relevant matter or circumstance;

(b) describes the actions to be taken by AEMO, Energy Safe Victoria, Registered participants, and any other relevant party for each category of gas emergency;

(c) sets out the customers or classes of customers to be curtailed in the case of each category of gas emergency and the order of their curtailment;

(d) describes the matters or things to be taken into account in determining who will be curtailed in the case of each category of gas emergency and the order of their curtailment;

(e) sets out the order of restoration of supply of gas to customers or classes of customers;

(f) describes the matters or things to be taken into account in determining the order of restoration of supply of gas to customers or classes of customers;

(g) provides for rationing of the supply of gas and the basis on which it will be administered;

(h) provides for how gas emergencies are to be managed and by whom;

(i) provides for any other matter relating to a gas emergency.

AEMO

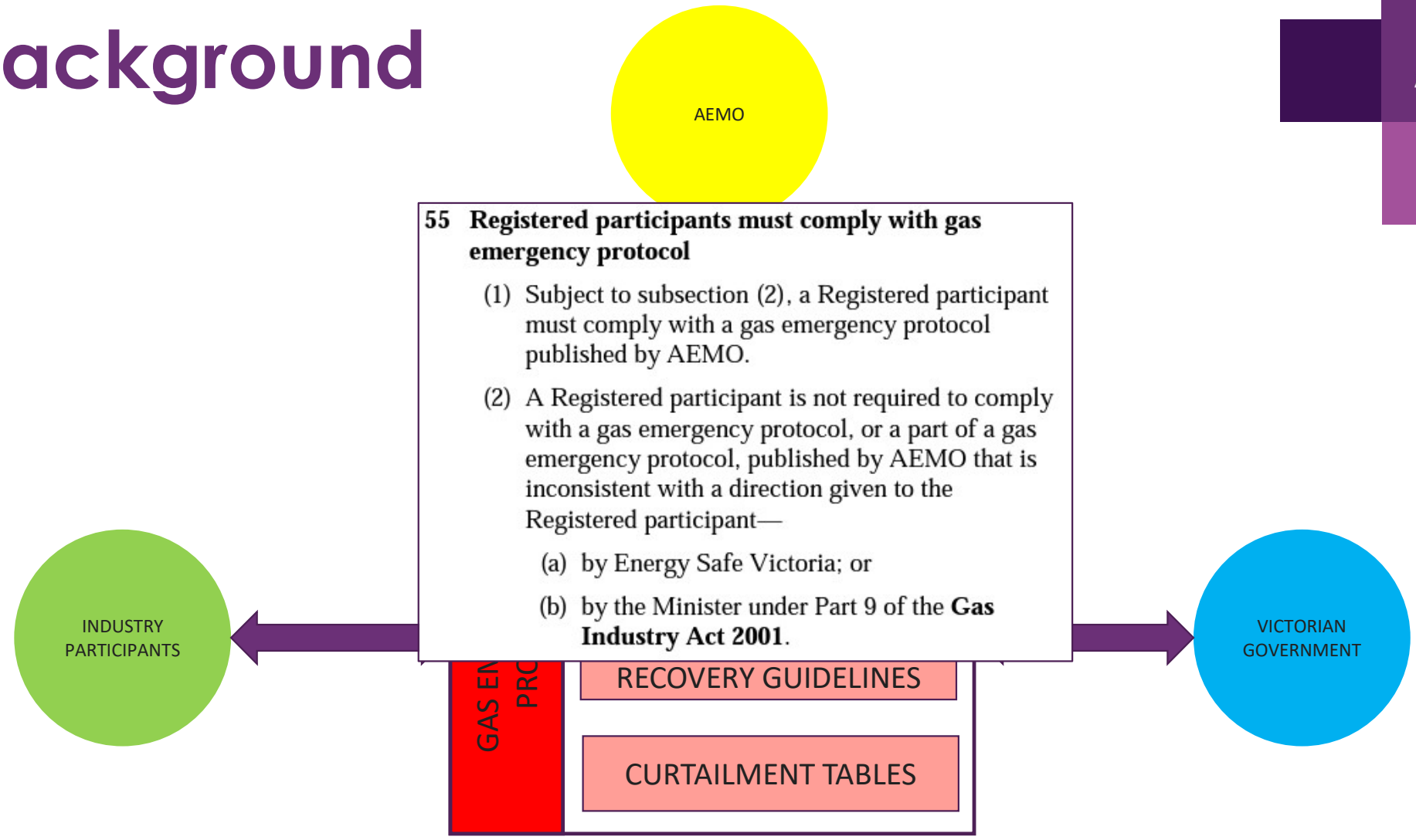
EMERGENCY
ROCEDURES (GAS)

LOAD CURTAILMENT
GAS RATIONING &
COVERY GUIDELINES

RTAILMENT TABLES

VICTORIAN GOVERNMENT

Background


AEMO
55 Registered participants must comply with gas emergency protocol
(1) Subject to subsection (2), a Registered participant must comply with a gas emergency protocol published by AEMO.
(2) A Registered participant is not required to comply with a gas emergency protocol, or a part of a gas emergency protocol, published by AEMO that is inconsistent with a direction given to the Registered participant—
(a) by Energy Safe Victoria; or
(b) by the Minister under Part 9 of the Gas Industry Act 2001.
INDUSTRY PARTICIPANTS
VICTORIAN GOVERNMENT
RECOVERY GUIDELINES
CURTAILMENT TABLES

Participant responsibilities - NGR

Subdivision 1 Emergencies

333 Emergency

(1) An emergency occurs when:

(a) AEMO reasonably believes there to be a situation which may threaten:

(i) reliability of gas supply; or

(ii) system security or the security of a declared distribution system; or

(iii) public safety,

and AEMO in its absolute discretion considers that the situation is an emergency and declares there to be an emergency; or

(b) AEMO declares there to be an emergency at the direction of a government authority authorised to give such directions.

(2) A Registered participant must notify AEMO as soon as practicable of:

(a) any event or situation of which the Registered participant becomes aware where, in the reasonable opinion of the Registered participant, that event or situation is of a kind described in subrule (1)(a); and

(b) any action taken by the Registered participant under its safety plan and safety procedures or otherwise in response to that event or situation.

Note:

This subrule is classified as a conduct provision under the National Gas (Victoria) (Declared System Provisions) Regulations. See clause 4 and Schedule 2 of the National Gas (Victoria) (Declared System Provisions) Regulations.

(3) AEMO may specify a process for communicating to Registered participants the existence of an emergency and all relevant information relating to the emergency.

(4) Subject to subrule (1)(b), the existence of an emergency under subrule (1)(a) will be determined by AEMO in its absolute discretion, irrespective of the cause of the emergency, and whether AEMO or any other person has caused or contributed to the emergency.

(5) Each Registered participant must use its best endeavours to ensure that its safety plan (if any) permits it to comply with emergency directions.

(6) An emergency will continue until such time as AEMO determines that the emergency has ended.

(7) When an emergency has ended in accordance with subrule (6), AEMO must notify all Registered participants that the emergency has ended.

Participant responsibilities - NGR

334 Participant emergency contacts

(1) Each Registered participant must provide AEMO with:

(a) a single telephone number and facsimile number at which a representative of the Registered participant is contactable by AEMO, 24 hours a day; and

(b) the name and title of the Registered participant's representative who is contactable at those numbers.

(2) The representative of each Registered participant must be a person having appropriate authority and responsibility within the Registered participant's organisation to act as the primary contact for AEMO in the event of an emergency.

(3) Each Registered participant must immediately notify AEMO of a change to the details required under subrule (1) and where possible in advance.

Participant responsibilities - NGR

336 Emergency procedures awareness

(1) Each Registered participant must at all times ensure that all of its relevant officers and staff and, where relevant, its Customers, are familiar with the emergency protocol and the Registered participant's safety plan or safety procedures.

(2) For the purposes of subrule (1), relevant officers and staff are those whose functions or areas of responsibility are such that they are likely to be required to make *decisions* or take action in an emergency.

Participant responsibilities - NGR

339 Declarations and directions in an emergency

(1) When an emergency arises, AEMO must:

(a) liaise with any jurisdictional safety body as required by applicable regulatory instruments or as directed by a government authority; and

(b) inform Registered participants, as soon as reasonably practicable, of the commencement, nature, extent and expected duration of the emergency and the way in which AEMO reasonably anticipates it will act in response to the emergency; and

(c) keep Registered participants informed of any material changes in the nature, extent and expected duration of an emergency.

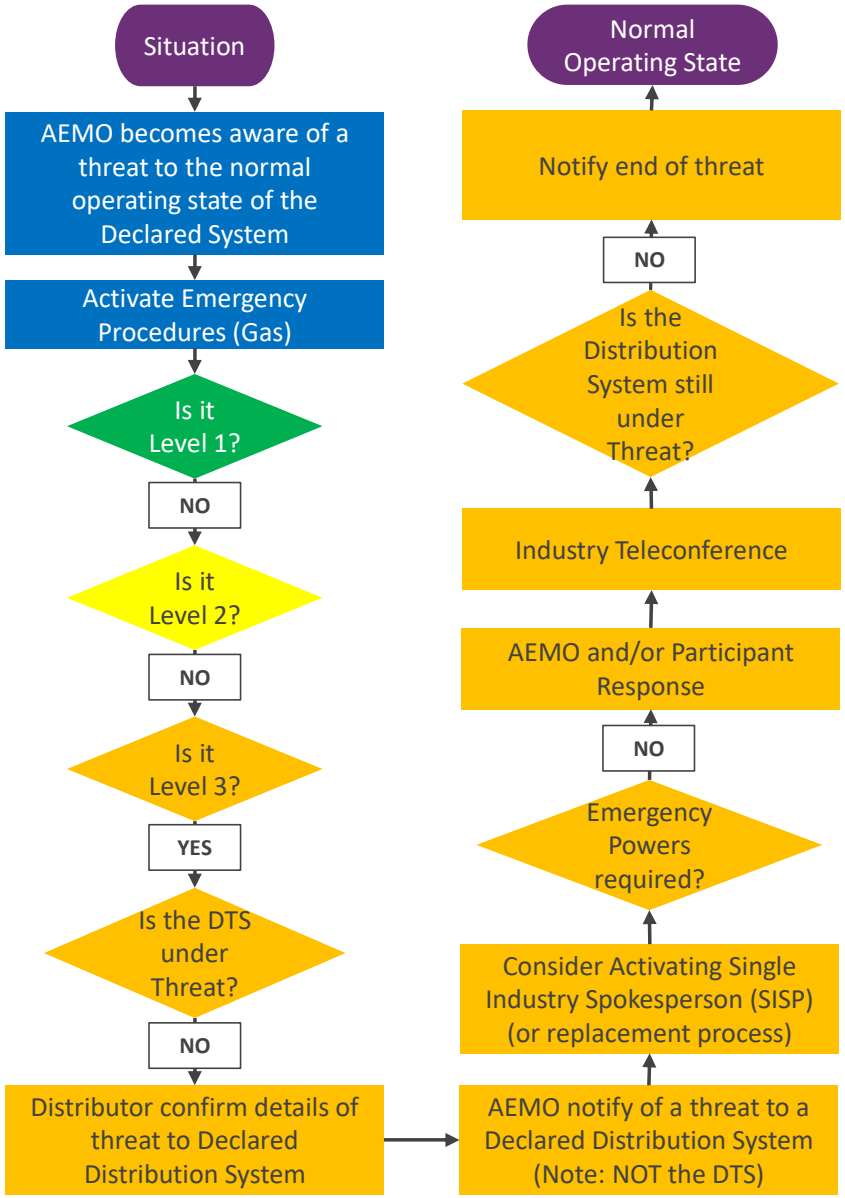
(2) Upon being informed of an emergency, each Registered participant must advise all relevant officers and staff (as defined in rule 336(2)) and, where relevant, its Customers, of the existence and nature of the emergency.

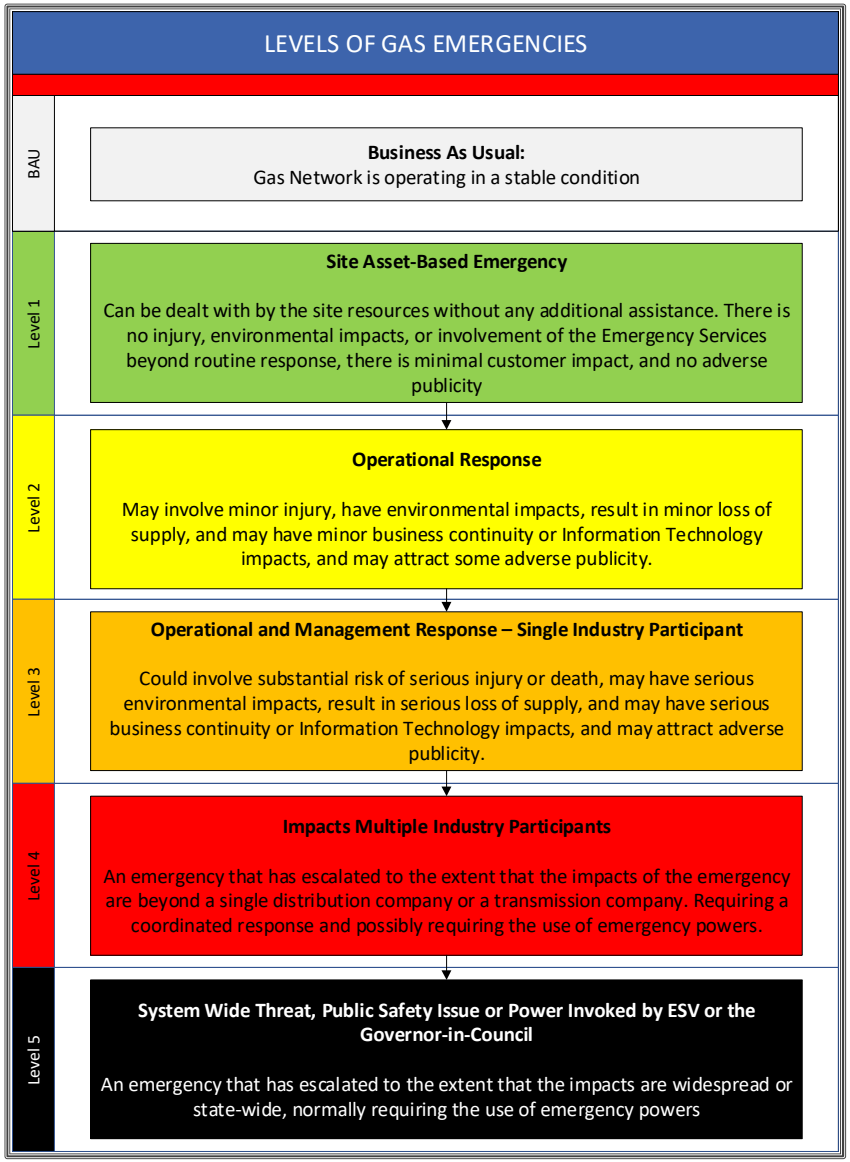
(3) During an emergency, each Registered participant must comply with its safety plan (if any) and safety procedures (if any).

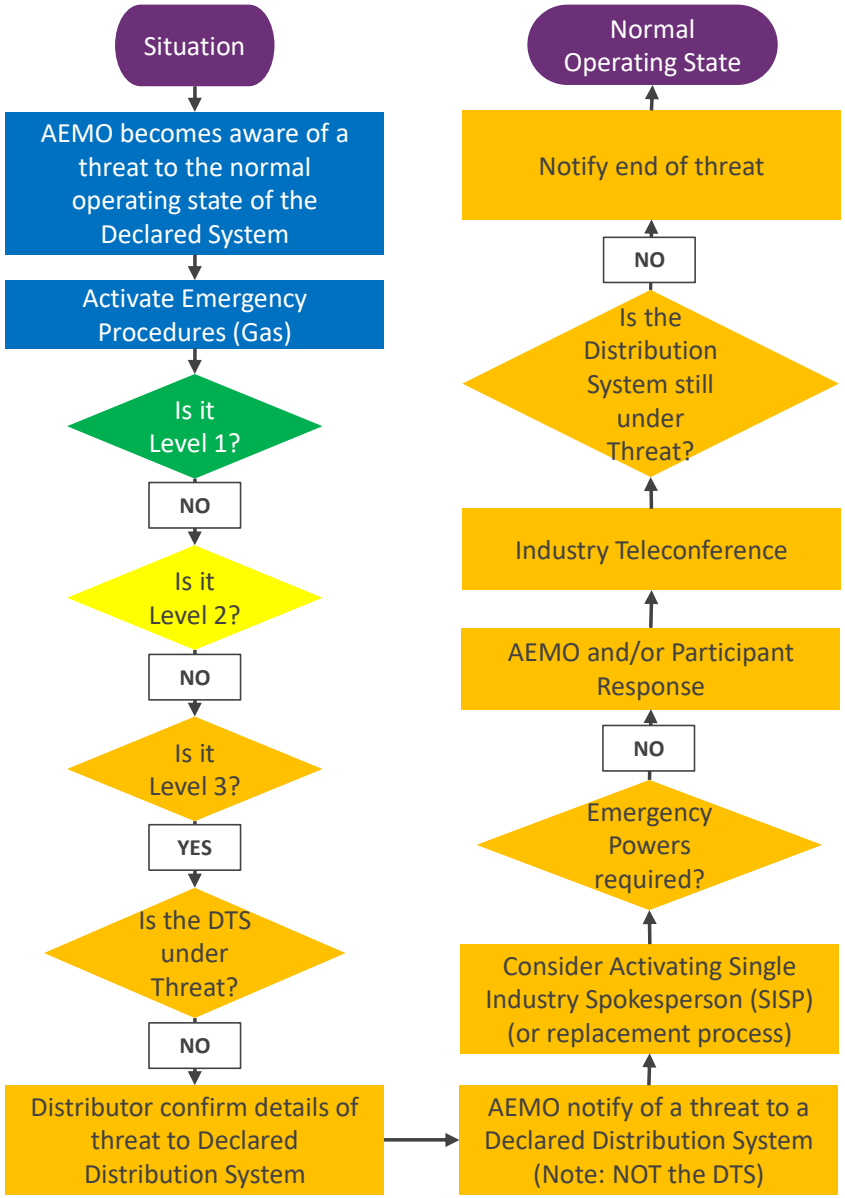
Note:

This subrule is classified as a conduct provision under the National Gas (Victoria) (Declared System Provisions) Regulations. See clause 4 and Schedule 2 of the National Gas (Victoria) (Declared System Provisions) Regulations.

(4) A Registered participant must use its reasonable endeavours to ensure that, during an emergency, its Customers act in a manner that enables that Registered participant to comply with all its obligations under this Division.


Situation
AEMO becomes aware of a threat to the normal operating state of the Declared System
Activate Emergency Procedures (Gas)
Is it Level 1?
NO
Is it Level 2?
NO
Is it Level 3?
YES
Is the DTS under Threat?
NO
Distributor confirm details of threat to Declared Distribution System
AEMO notify of a threat to a Declared Distribution System (Note: NOT the DTS)
Consider Activating Single Industry Spokesperson (SISP) (or replacement process)
Emergency Powers required?
NO
AEMO and/or Participant Response
Industry Teleconference
Is the Distribution System still under Threat?
NO
Notify end of threat
Normal Operating State


LEVELS OF GAS EMERGENCIES
BAU
Business As Usual:
Gas Network is operating in a stable condition
Level 1
Site Asset-Based Emergency
Can be dealt with by the site resources without any additional assistance. There is no injury, environmental impacts, or involvement of the Emergency Services beyond routine response, there is minimal customer impact, and no adverse publicity
Level 2
Operational Response
May involve minor injury, have environmental impacts, result in minor loss of supply, and may have minor business continuity or Information Technology impacts, and may attract some adverse publicity.
Level 3
Operational and Management Response – Single Industry Participant
Could involve substantial risk of serious injury or death, may have serious environmental impacts, result in serious loss of supply, and may have serious business continuity or Information Technology impacts, and may attract adverse publicity.
Level 4
Impacts Multiple Industry Participants
An emergency that has escalated to the extent that the impacts of the emergency are beyond a single distribution company or a transmission company. Requiring a coordinated response and possibly requiring the use of emergency powers.
Level 5
System Wide Threat, Public Safety Issue or Power Invoked by ESV or the Governor-in-Council
An emergency that has escalated to the extent that the impacts are widespread or state-wide, normally requiring the use of emergency powers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AEMO becomes aware of a threat to the normal operating state of the Declared System
Activate Emergency Procedures (Gas)
Is it Level 1?
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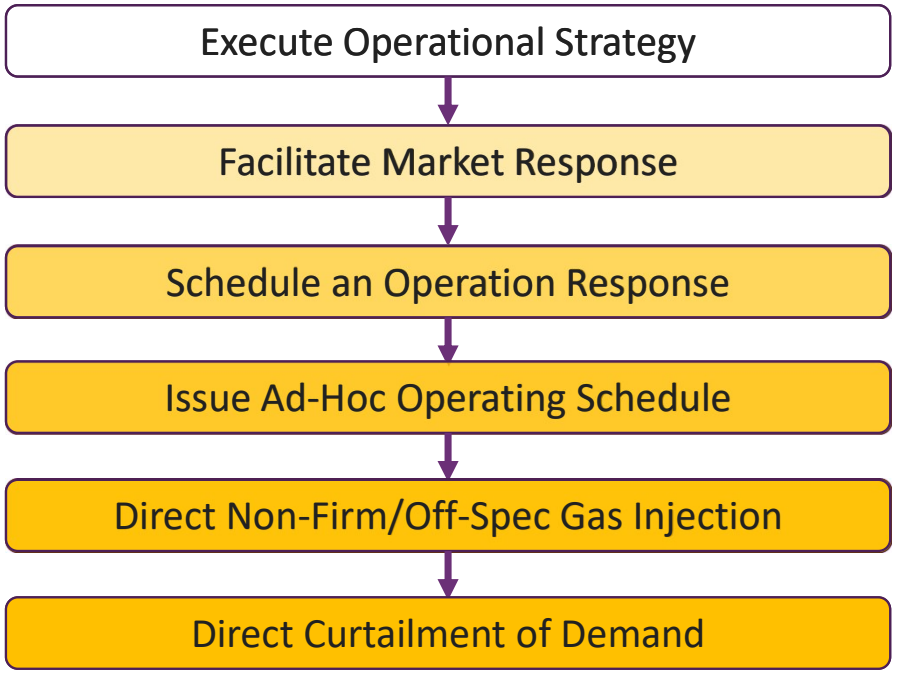
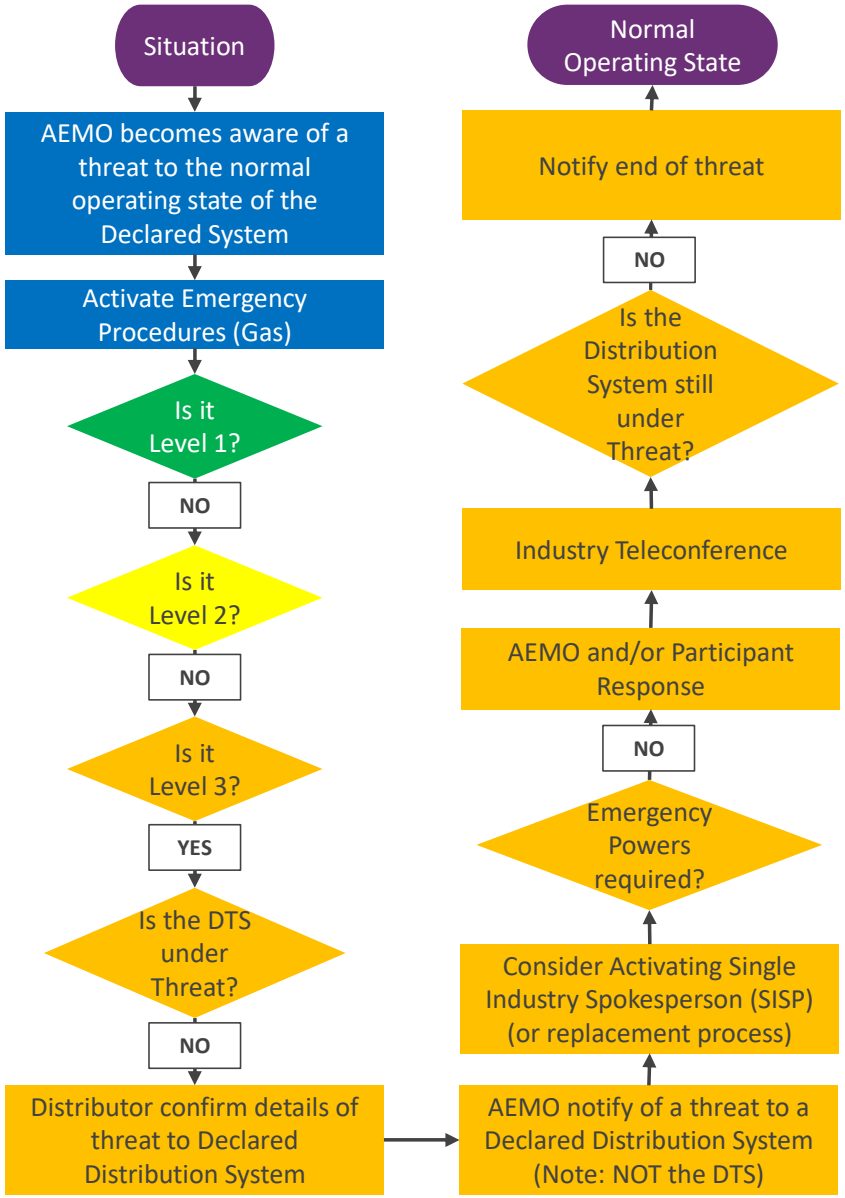
Is it Level 2?
NO
Is it Level 3?
YES
Is the DTS under Threat?
NO
Distributor confirm details of threat to Declared Distribution System
AEMO notify of a threat to a Declared Distribution System (Note: NOT the DTS)
Consider Activating Single Industry Spokesperson (SISP) (or replacement process)
Emergency Powers required?
NO
AEMO and/or Participant Response
Industry Teleconference
Is the Distribution System still under Threat?
NO
Notify end of threat
Normal Operating State


Execute Operational Strategy
Facilitate Market Response
Schedule an Operation Response
Issue Ad-Hoc Operating Schedule
Direct Non-Firm/Off-Spec Gas Injection
Direct Curtailment of Demand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Emergency Powers required?
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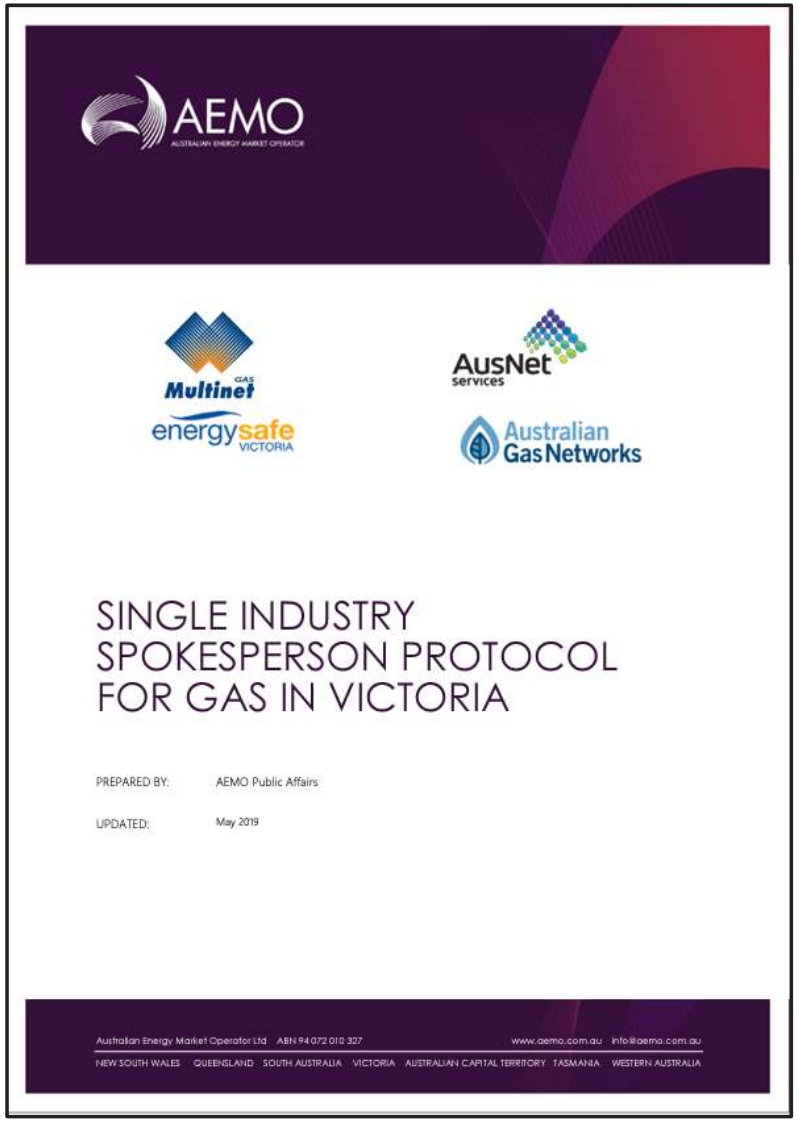
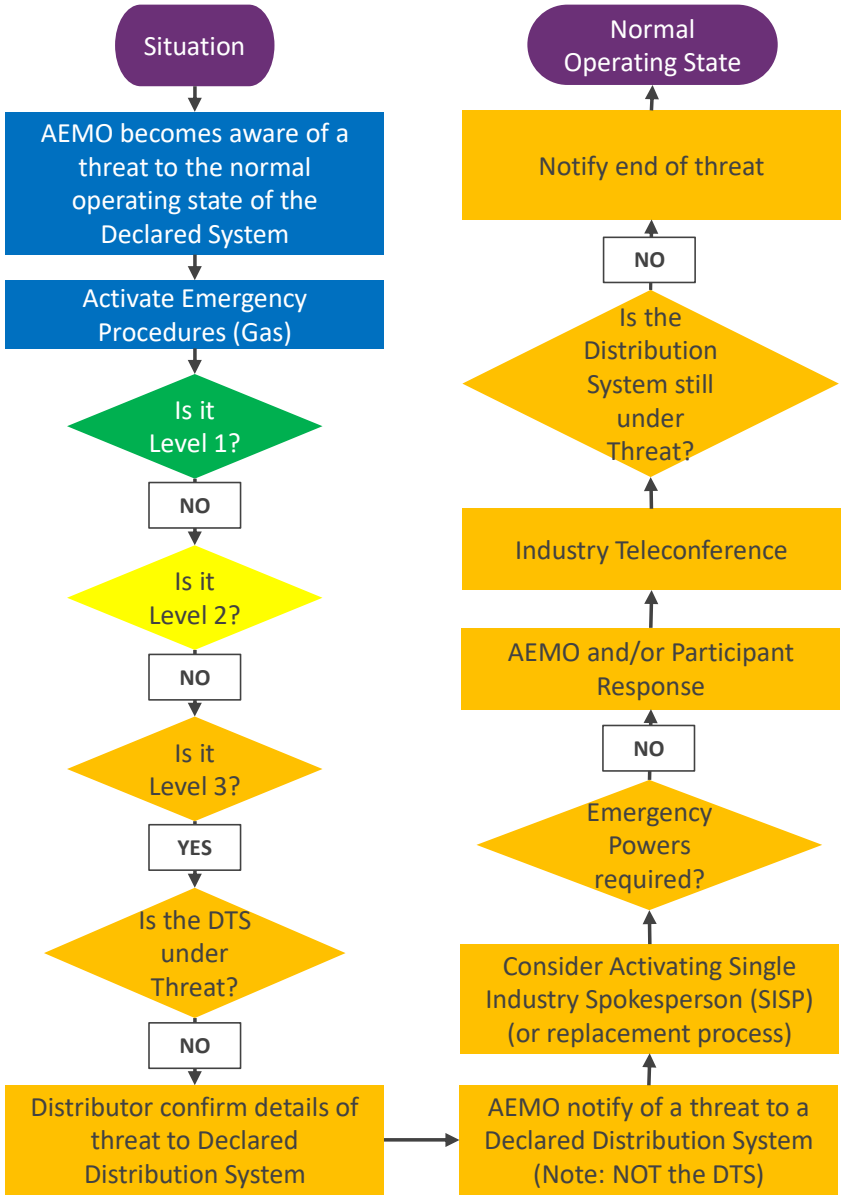
AEMO and/or Participant Response
Industry Teleconference
Is the Distribution System still under Threat?
NO
Notify end of threat
Normal Operating State


AEMO
Multinet GAS
AusNet services
energysafe VICTORIA
Australian Gas Networks
SINGLE INDUSTRY SPOKESPERSON PROTOCOL FOR GAS IN VICTORIA
PREPARED BY: AEMO Public Affairs
UPDATED: May 2019
Australian Energy Market Operator Ltd ABN 94 072 010 327 www.aemo.com.au info@aemo.com.au
NEW SOUTH WALES QUEENSLAND SOUTH AUSTRALIA VICTORIA AUSTRALIAN CAPITAL TERRITORY TASMANIA WESTERN AUSTRALIA

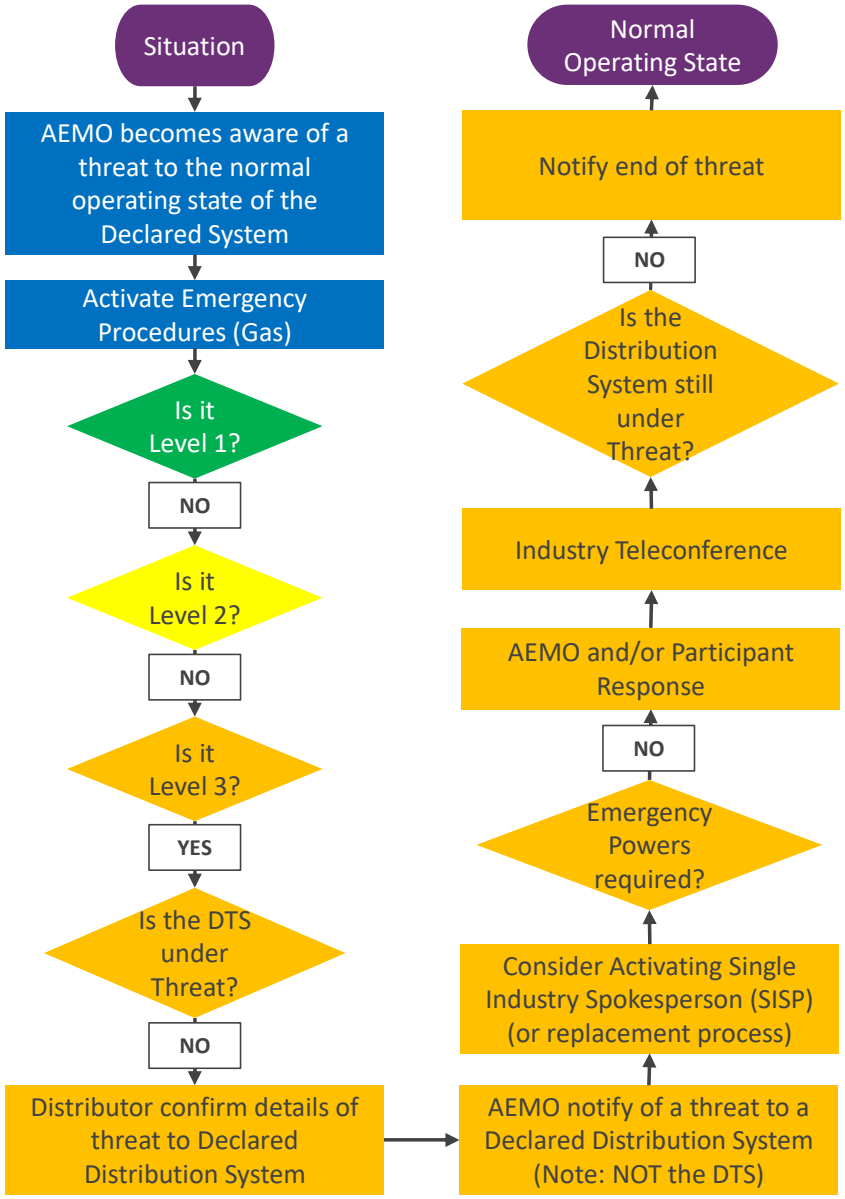


2.5. Emergency powers

Emergency powers, as defined for these Procedures, is the authority invested in:

- ESV, under the *Gas Safety Act*;
- the Minister, under the *Gas Industry Act*; and
- a gas company, under the *Gas Industry Act*.

to overcome a threat to the normal operating state of a Declared system.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AEMO and/or Participant Response
Industry Teleconference
Is the Distribution System still under Threat?
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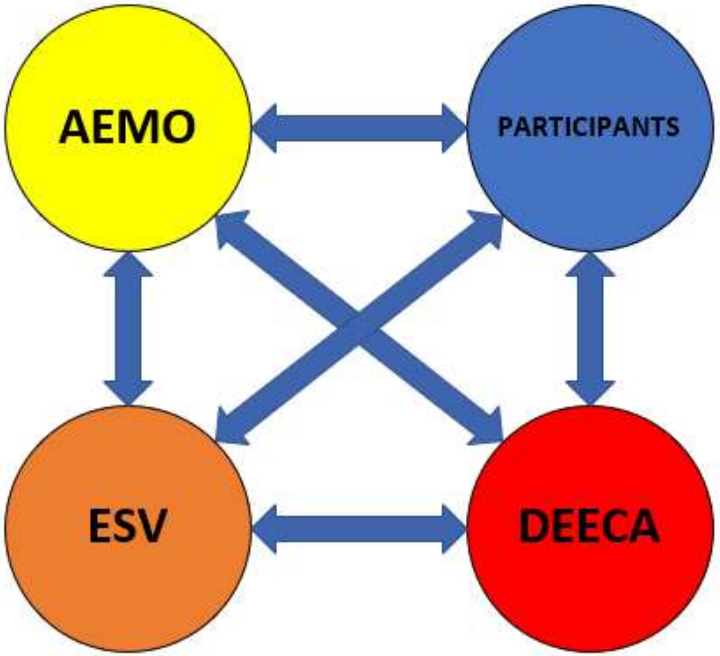
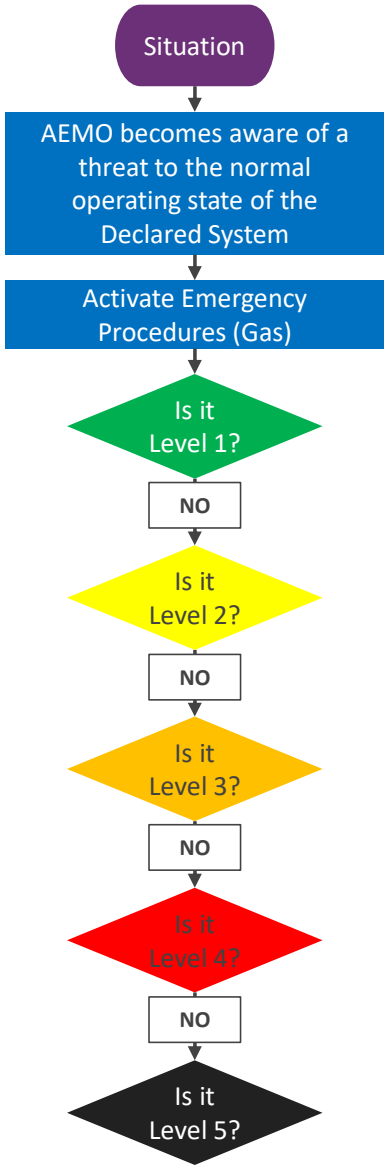
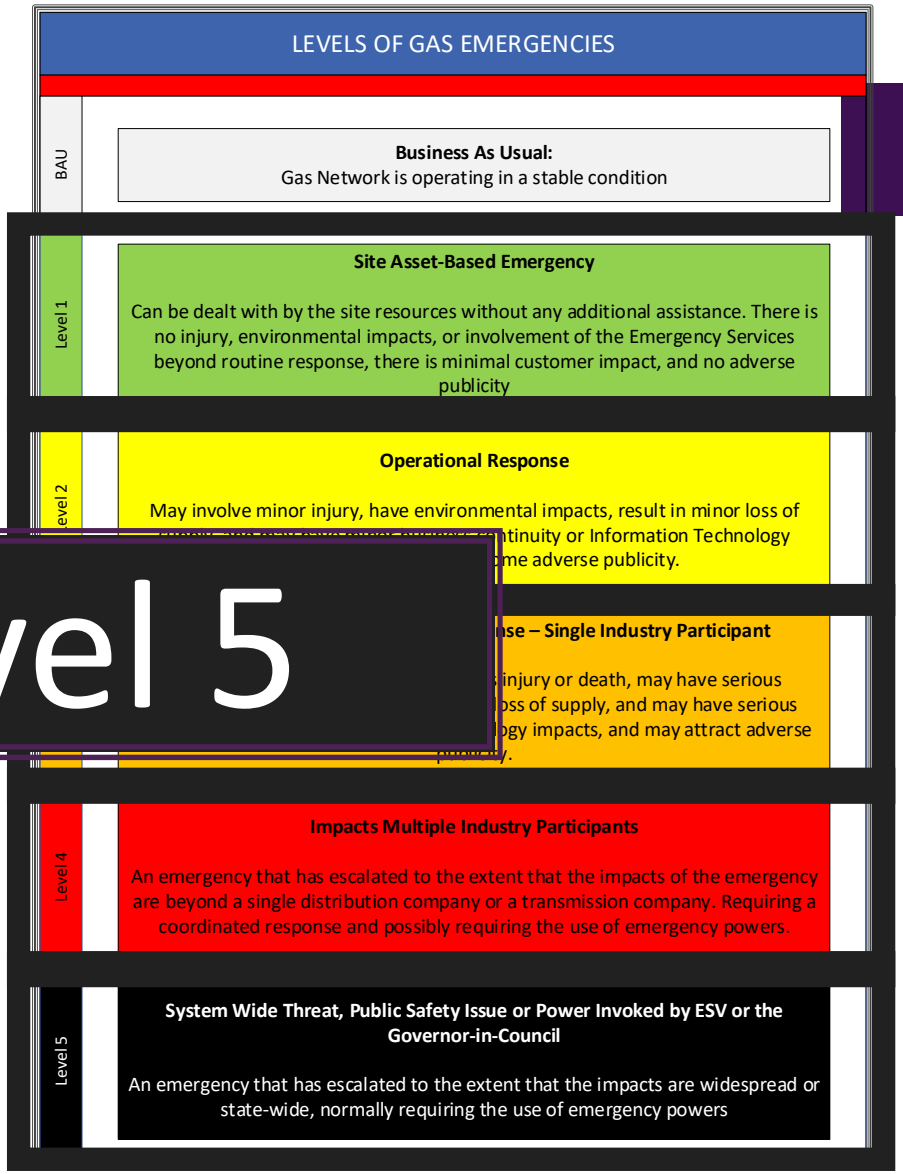
Notify end of threat
Normal Operating State


AEMO
PARTICIPANTS
ESV
DEECA


Situation
AEMO becomes aware of a threat to the normal operating state of the Declared System
Activate Emergency Procedures (Gas)
Is it Level 1?
NO
Is it Level 2?
NO
Is it Level 3?
NO
Is it Level 4?
NO
Is it Level 5?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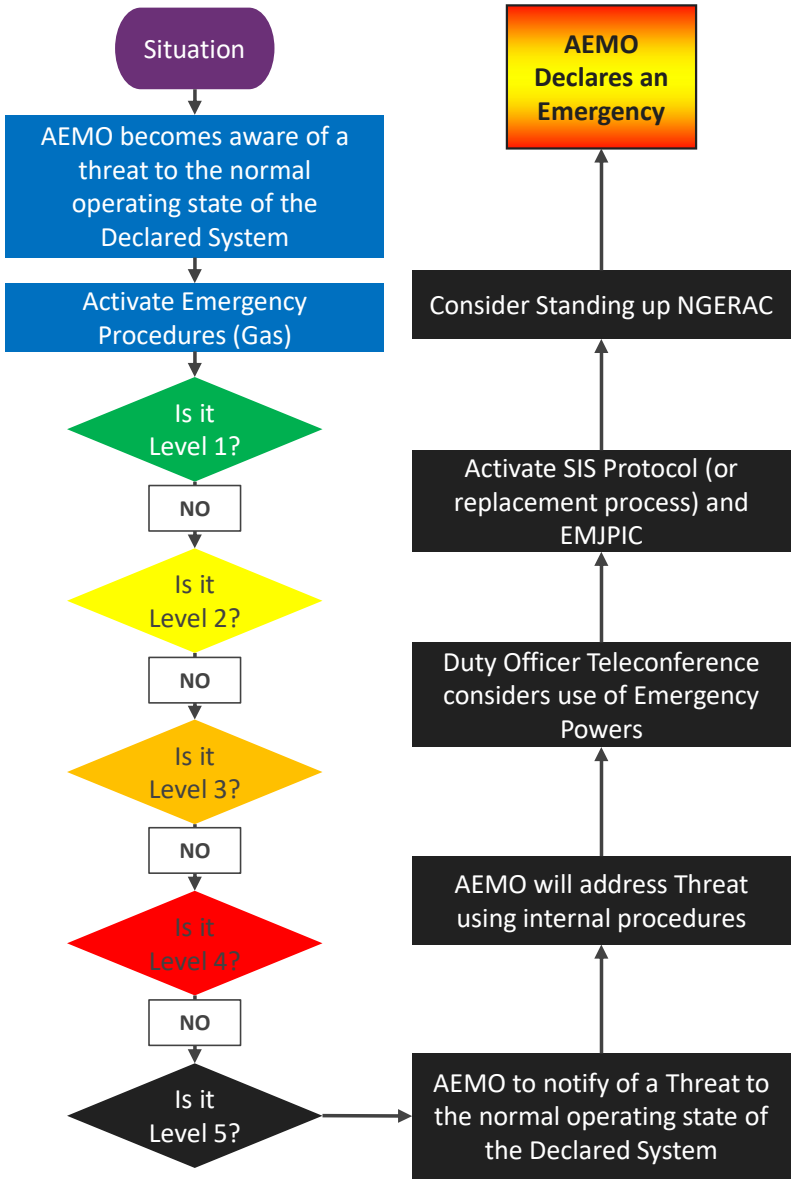
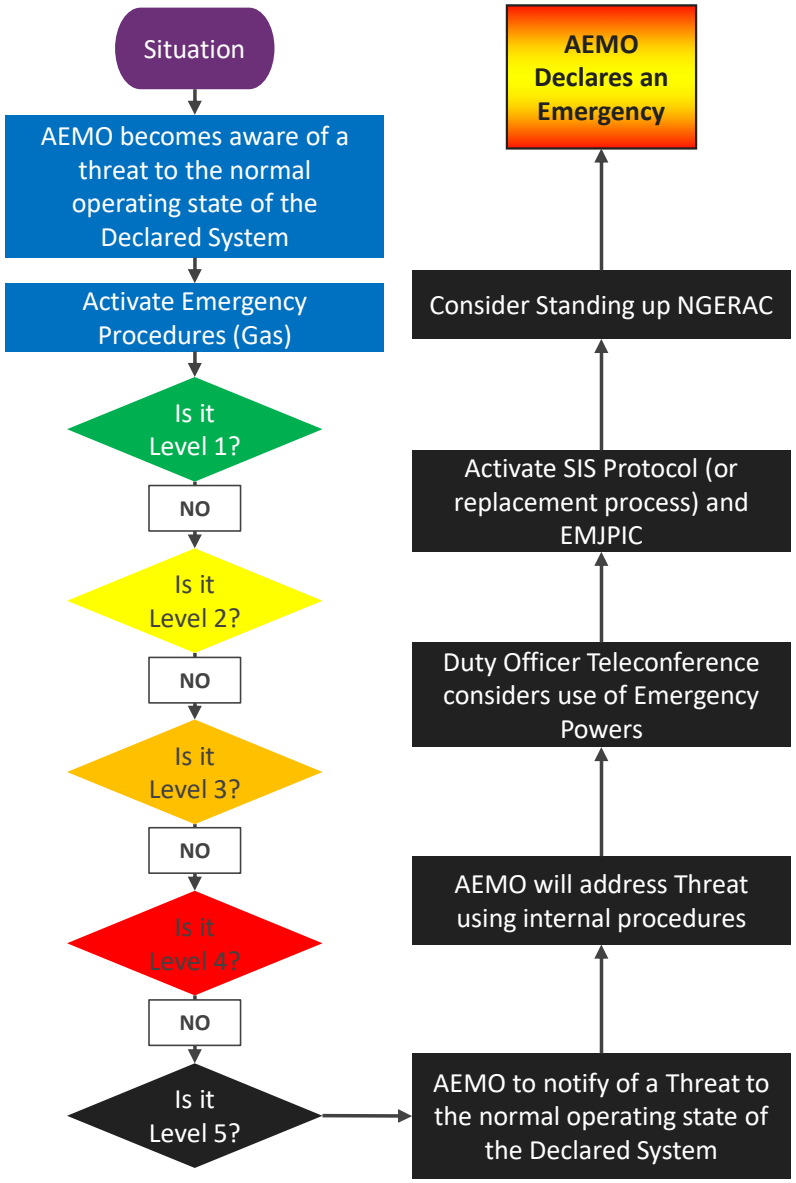
System Wide Threat, Public Safety Issue or Power Invoked by ESV or the Governor-in-Council
An emergency that has escalated to the extent that the impacts are widespread or state-wide, normally requiring the use of emergency powers

Level 5



National Gas Emergency Response Advisory Committee (NGERAC)

The National Gas Emergency Response Advisory Committee (NGERAC) is a planning and coordinating forum made up of industry and government representatives. NGERAC facilitates efficient and effective communication across industry and government during major natural gas supply shortages. The NGERAC meets twice a year.


Situation
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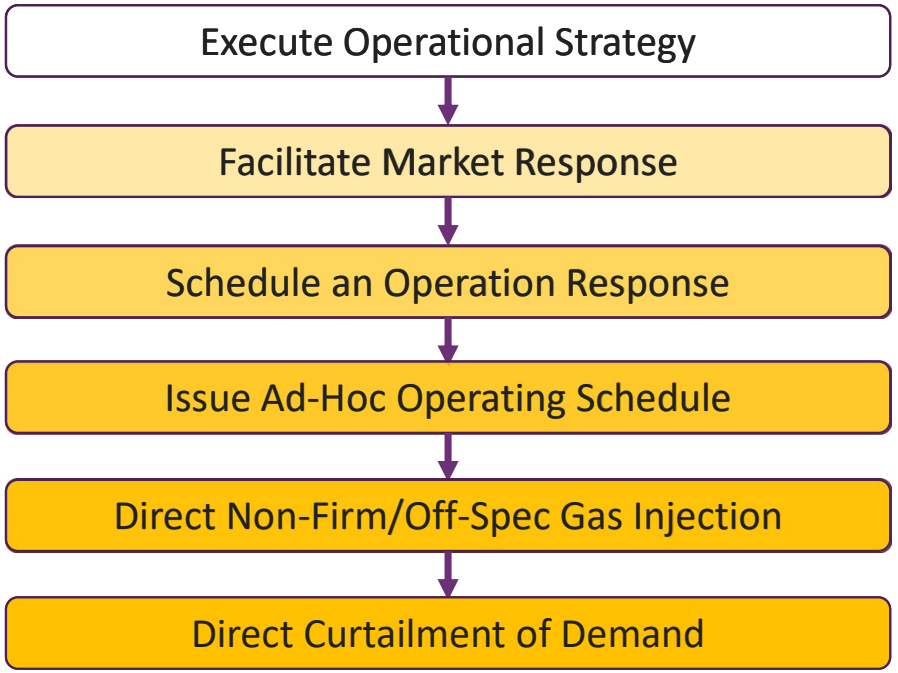
Activate Emergency Procedures (Gas)
Is it Level 1?
NO
Is it Level 2?
NO
Is it Level 3?
NO
Is it Level 4?
NO
Is it Level 5?
AEMO to notify of a Threat to the normal operating state of the Declared System
AEMO will address Threat using internal procedures
Duty Officer Teleconference considers use of Emergency Powers
Activate SIS Protocol (or replacement process) and EMJPIC
Consider Standing up NGERAC
AEMO Declares an Emergency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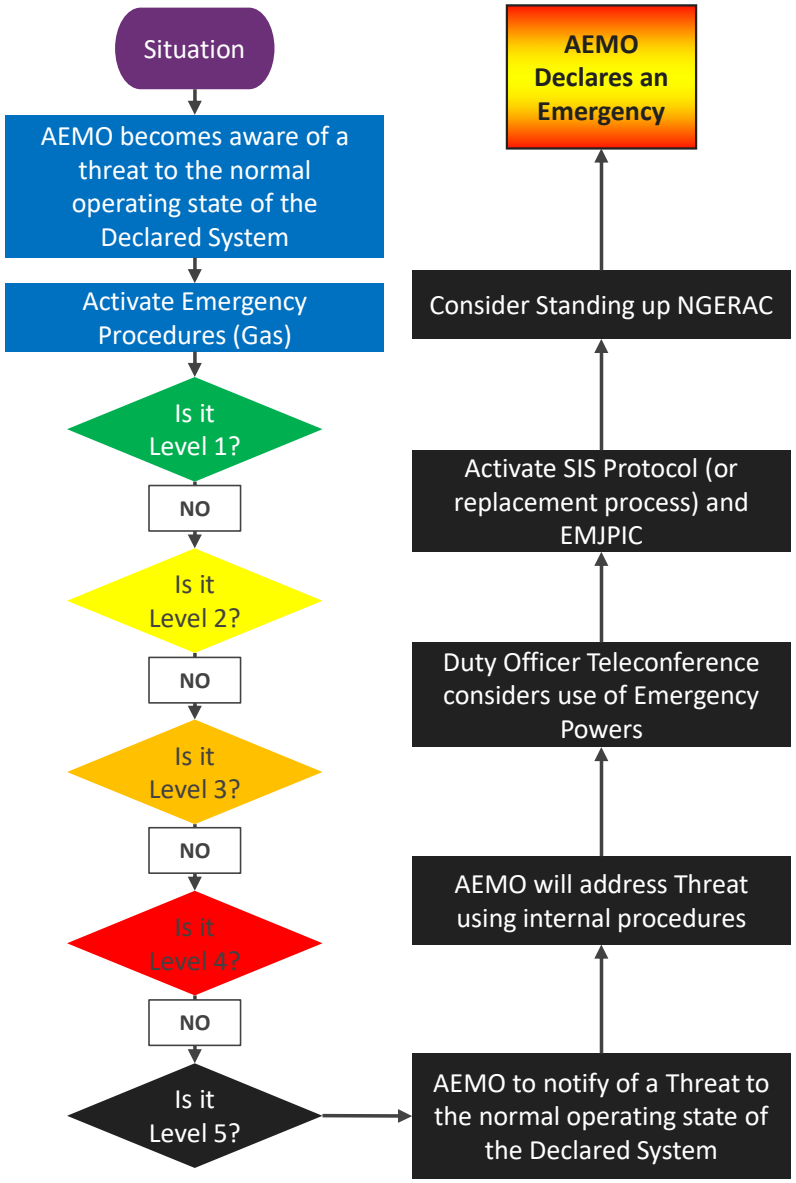


Division 5 Intervention and market suspension

Subdivision 1 Emergencies

333 Emergency

(1) An emergency occurs when:

(a) AEMO reasonably believes there to be a situation which may threaten:

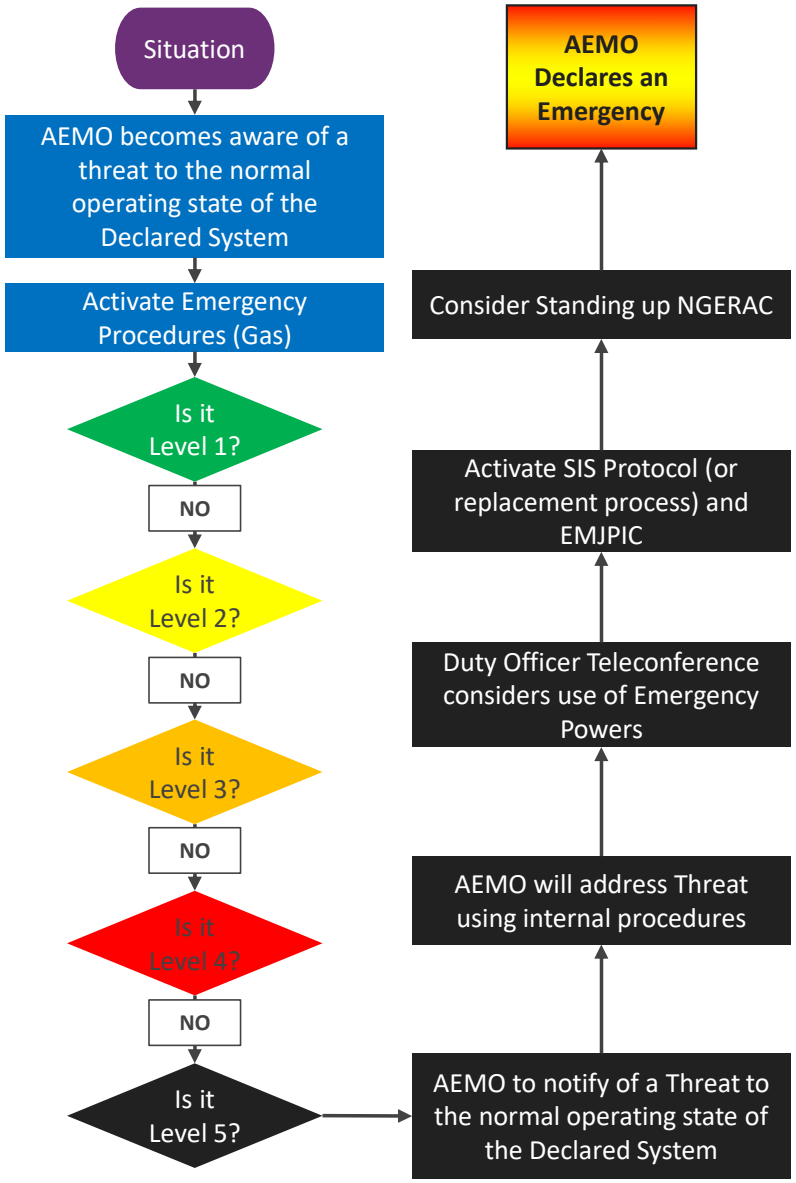
(i) reliability of gas supply; or

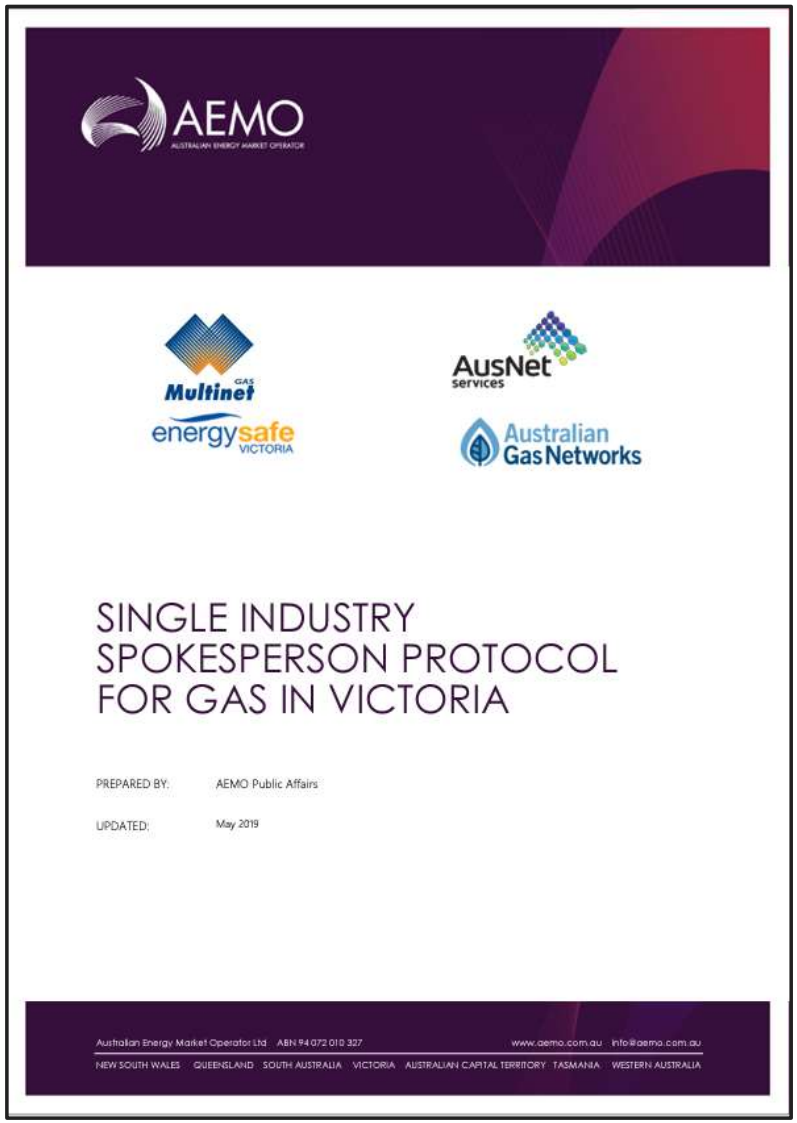
(ii) system security or the security of a declared distribution system; or

(iii) public safety,

and AEMO in its absolute discretion considers that the situation is an emergency and declares there to be an emergency; or

(b) AEMO declares there to be an emergency at the direction of a government authority authorised to give such directions.


Situation
AEMO becomes aware of a threat to the normal operating state of the Declared System
Activate Emergency Procedures (Gas)
Is it Level 1?
NO
Is it Level 2?
NO
Is it Level 3?
NO
Is it Level 4?
NO
Is it Level 5?
AEMO to notify of a Threat to the normal operating state of the Declared System
AEMO will address Threat using internal procedures
Duty Officer Teleconference considers use of Emergency Powers
Activate SIS Protocol (or replacement process) and EMJPIC
Consider Standing up NGERAC
AEMO Declares an Emergency


AEMO
Multinet GAS
AusNet services
energysafe VICTORIA
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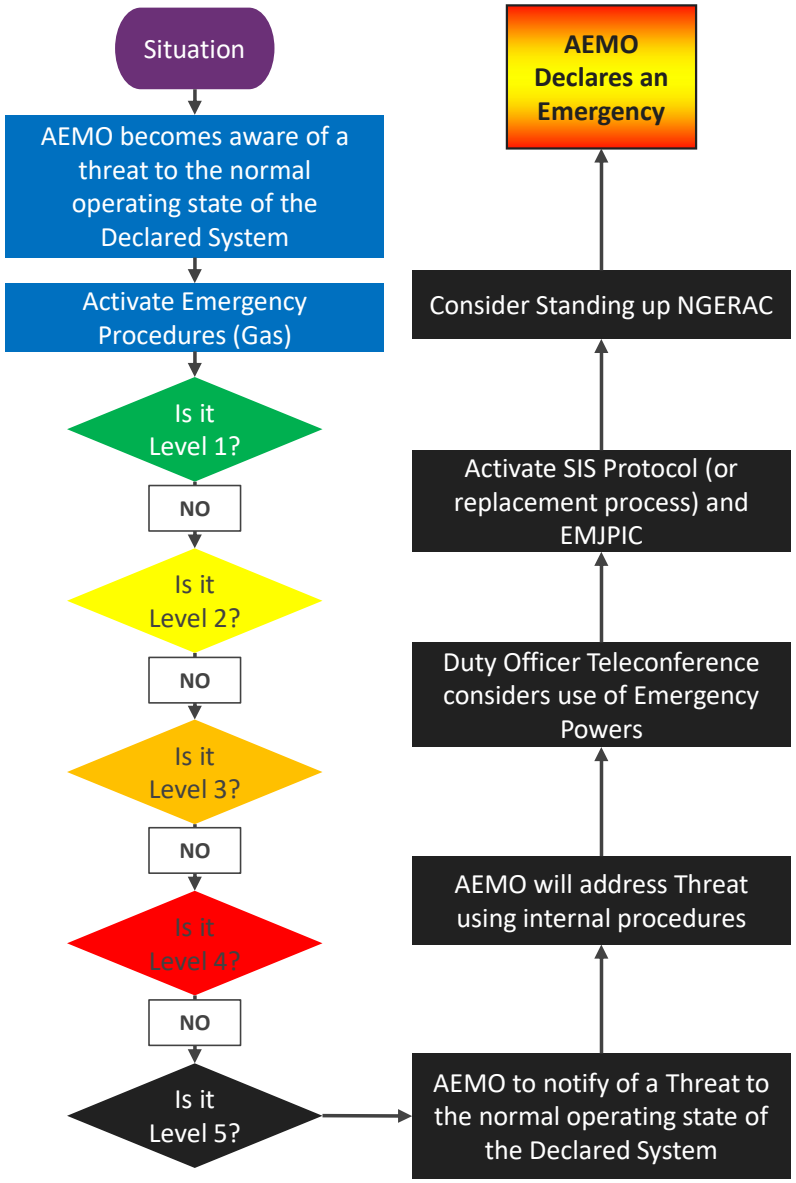
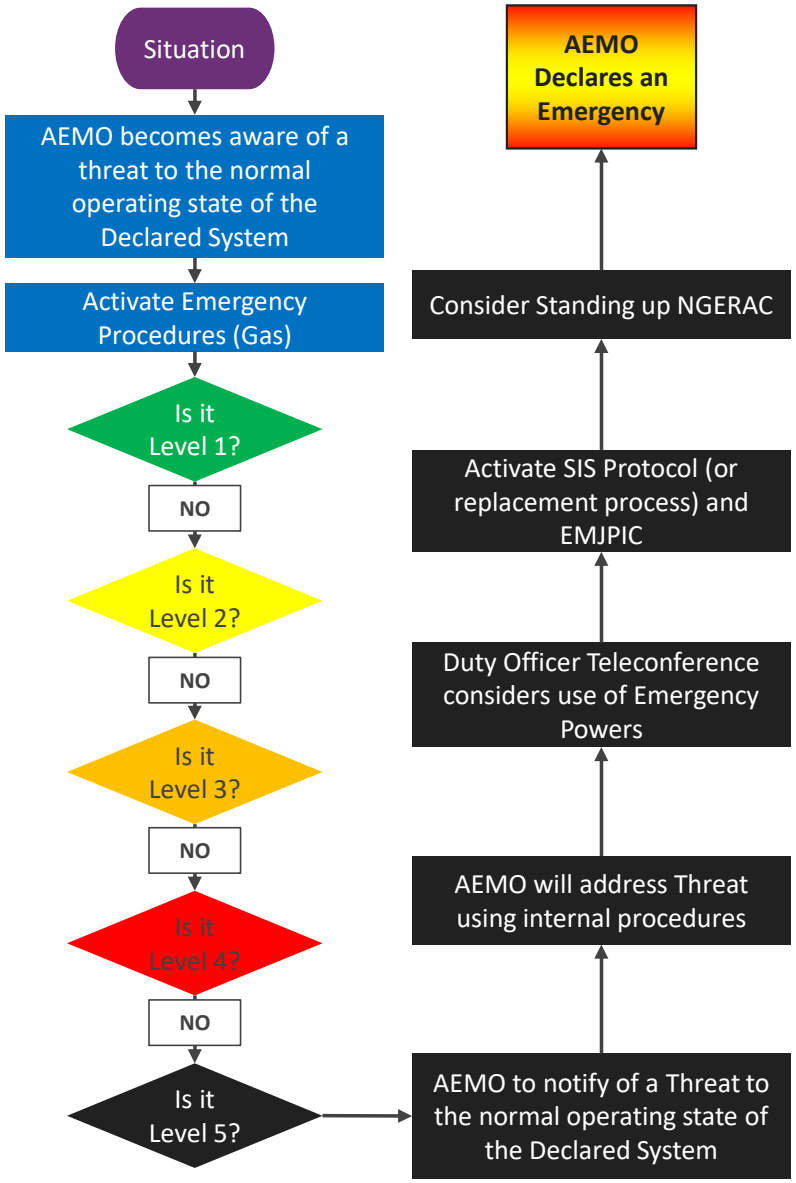
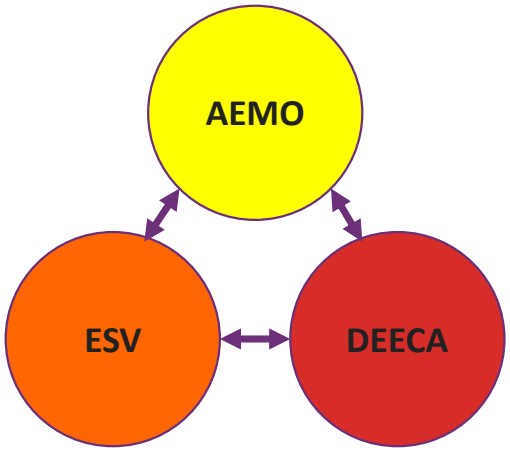
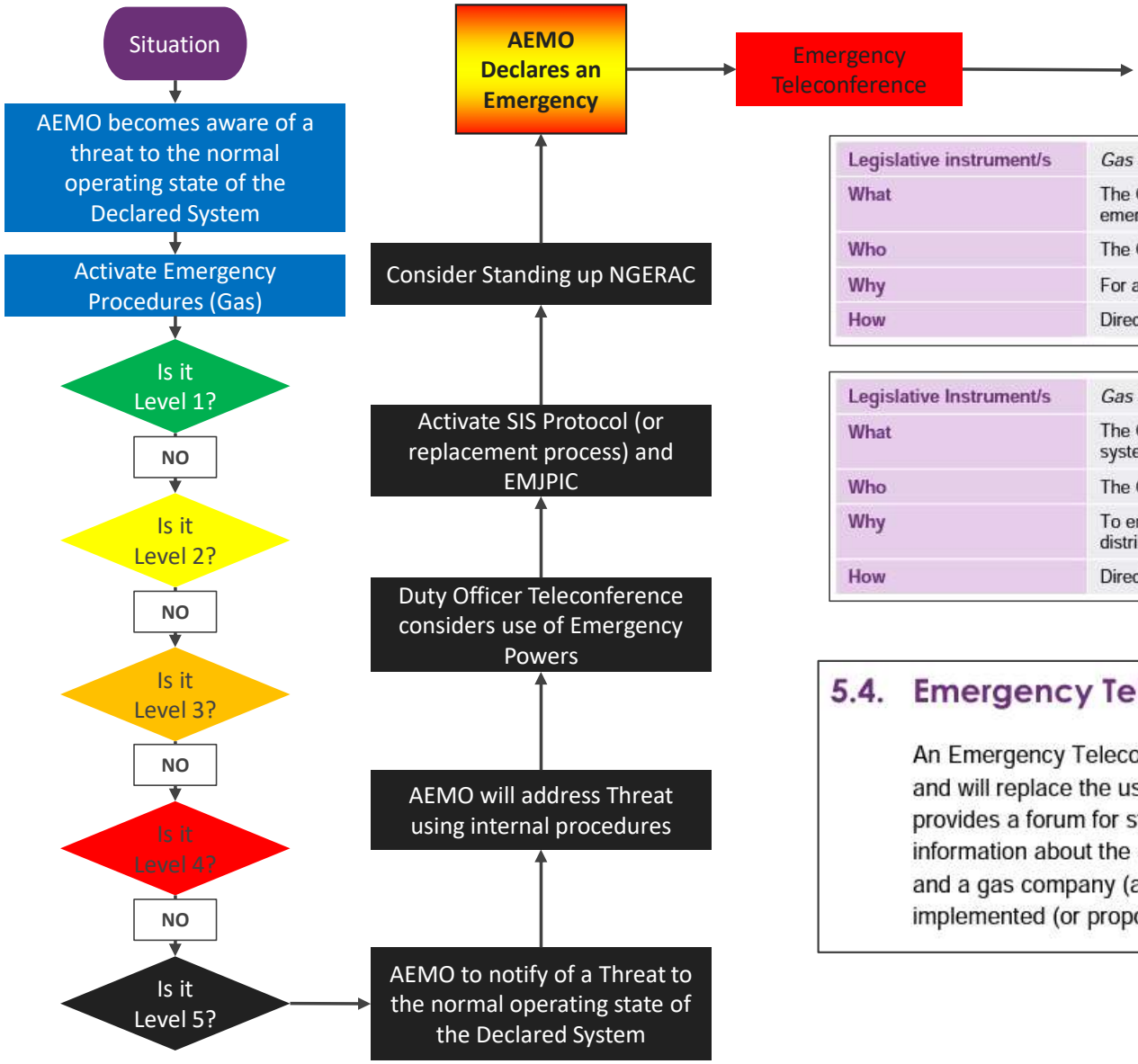
SINGLE INDUSTRY SPOKESPERSON PROTOCOL FOR GAS IN VICTORIA
PREPARED BY: AEMO Public Affairs
UPDATED: May 2019
Australian Energy Market Operator Ltd ABN 94 072 010 327 www.aemo.com.au info@aemo.com.au
NEW SOUTH WALES QUEENSLAND SOUTH AUSTRALIA VICTORIA AUSTRALIAN CAPITAL TERRITORY TASMANIA WESTERN AUSTRALIA



Emergency Management Joint Public Information Committee (EMJPIC)
A state committee that supports operational public information processes by coordinating whole of government emergency management communications and community engagement. EMJPIC coordinates appropriate stakeholders for each specific event where possible, including state, local and federal agencies, businesses and relevant industries and fosters partnerships with media.


Situation
AEMO becomes aware of a threat to the normal operating state of the Declared System
Activate Emergency Procedures (Gas)
Is it Level 1?
NO
Is it Level 2?
NO
Is it Level 3?
NO
Is it Level 4?
NO
Is it Level 5?
AEMO to notify of a Threat to the normal operating state of the Declared System
AEMO will address Threat using internal procedures
Duty Officer Teleconference considers use of Emergency Powers
Activate SIS Protocol (or replacement process) and EMJPIC
Consider Standing up NGERAC
AEMO Declares an Emergency


AEMO
ESV
DEECA

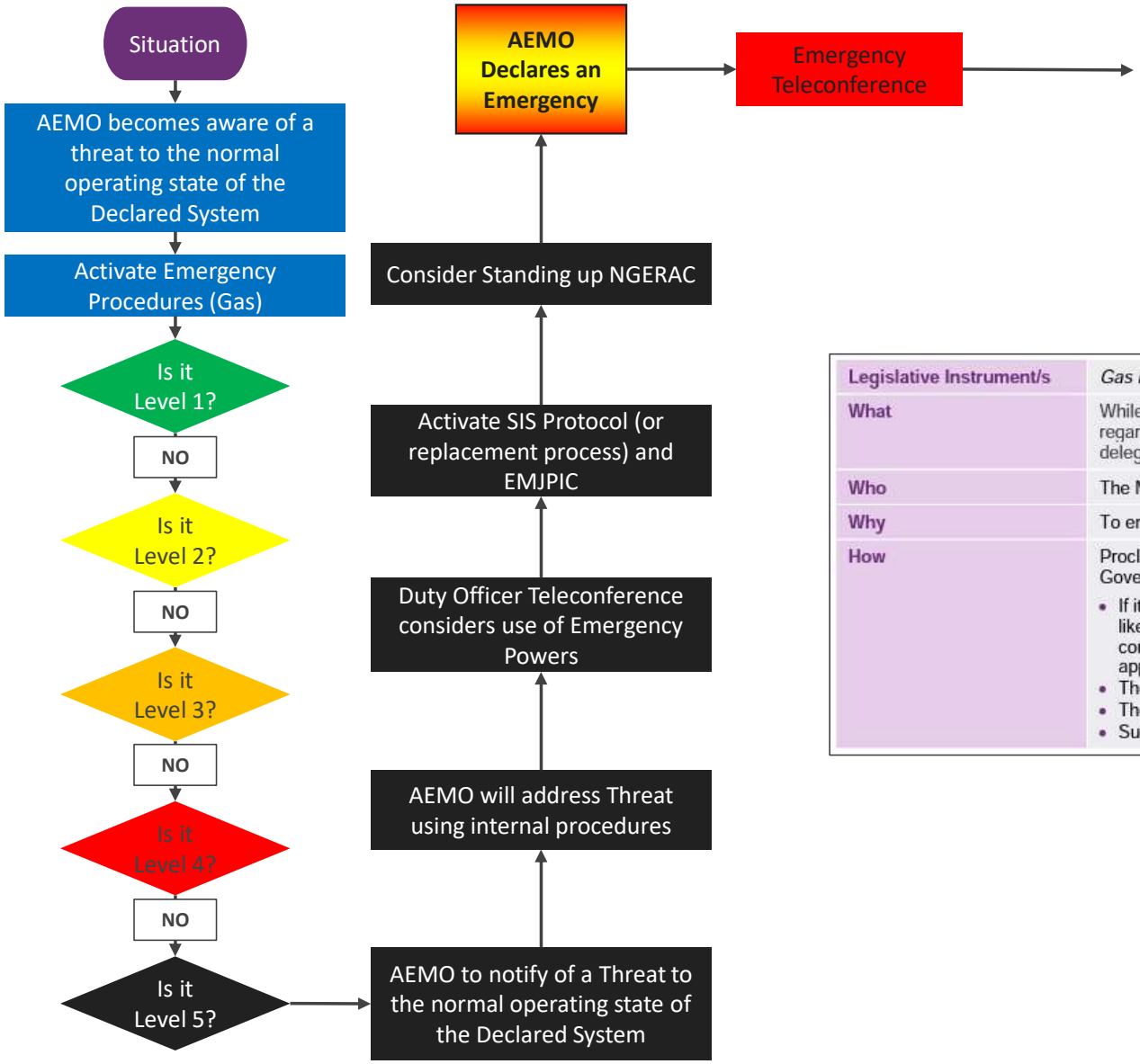


Legislative instrument/s	*Gas Safety Act 1997* (section 107(1))
What	The Chairperson can direct any person[1] do anything necessary to make a gas emergency situation safe.
Who	The Chairperson can direct any person.
Why	For any safety reason
How	Directions must be in writing.

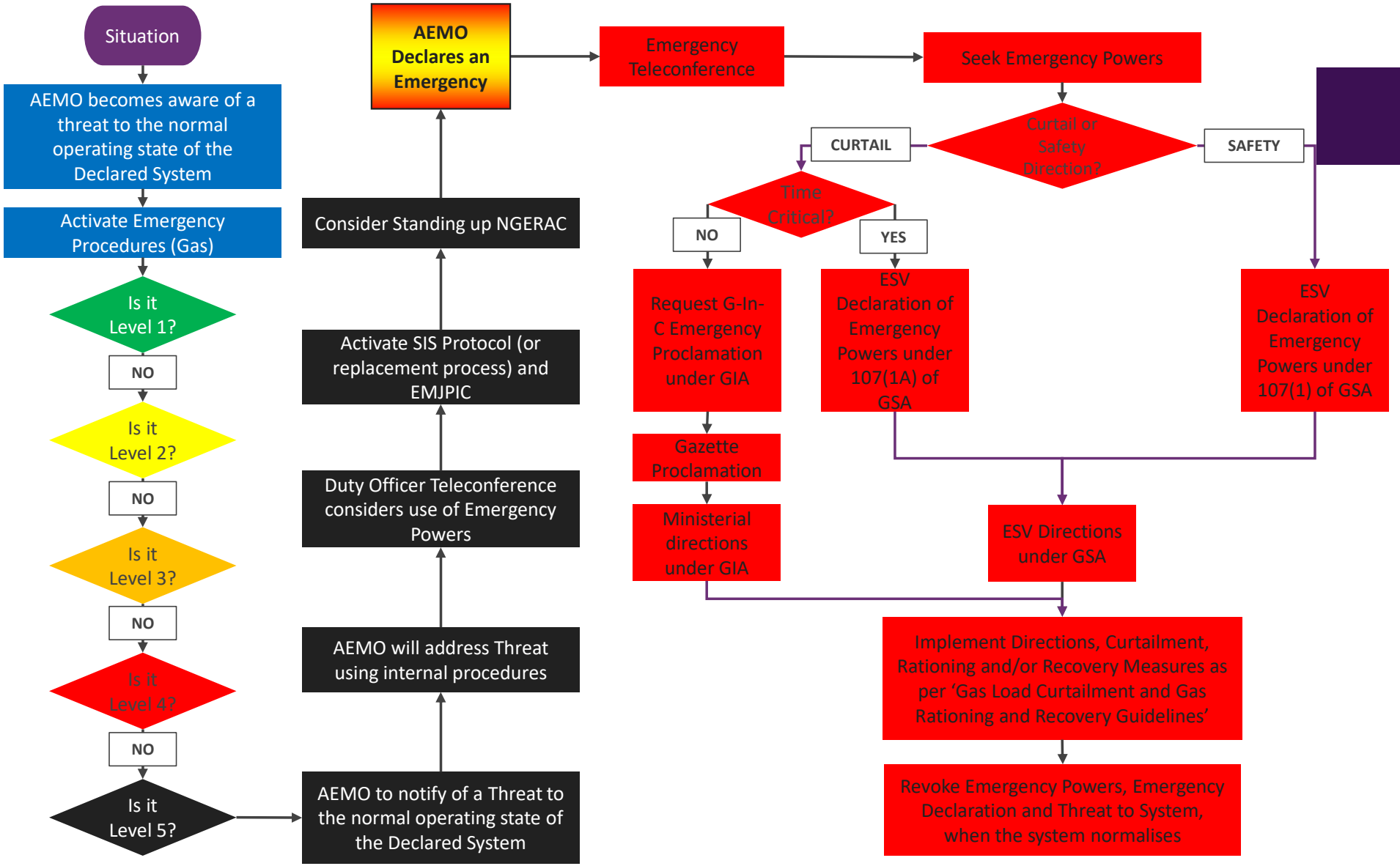
Legislative Instrument/s	*Gas Safety Act 1997* (section 107(1A))
What	The Chairperson can direct any person to do anything necessary to secure the gas system and/or facilitate the reliability of supply.
Who	The Chairperson can direct any person.
Why	To ensure gas reliability and security of the system for the transmission or distribution of gas.
How	Directions must be in writing.

5.4. Emergency Teleconference

An Emergency Teleconference is initiated following a declaration of an Emergency by AEMO and will replace the use of the Industry Teleconference to brief participants. The teleconference provides a forum for stakeholders to seek more information or to provide feedback or additional information about the emergency response options. It also allows AEMO, ESV, the Department and a gas company (as appropriate) to explain its reasoning for the measures being implemented (or proposed to be implemented).



Legislative Instrument/s	*Gas Industry Act 2001*, Part 9, Gas Emergency Provisions, sections 206 & 207
What	While an emergency proclamation is in force, the Minister, or delegate, may, having regard to the needs of the community, give any directions that the Minister, or delegate, thinks necessary.
Who	The Minister, or delegate, can direct any person.
Why	To ensure safe and sure gas supply or regulate use of the available supply.
How	Proclamation of emergency provisions must have been made and gazetted by the Governor in Council as follows: • If it appears to the Governor in Council that the available supply of gas is or is likely to become less than is sufficient for the reasonable requirements of the community, the Governor in Council may, by proclamation, declare that Part 9 is to apply. • The proclamation must be published in the Government Gazette. • The proclamation takes effect on the date of its publication. • Subsequent Ministerial directions must be in writing.


Situation
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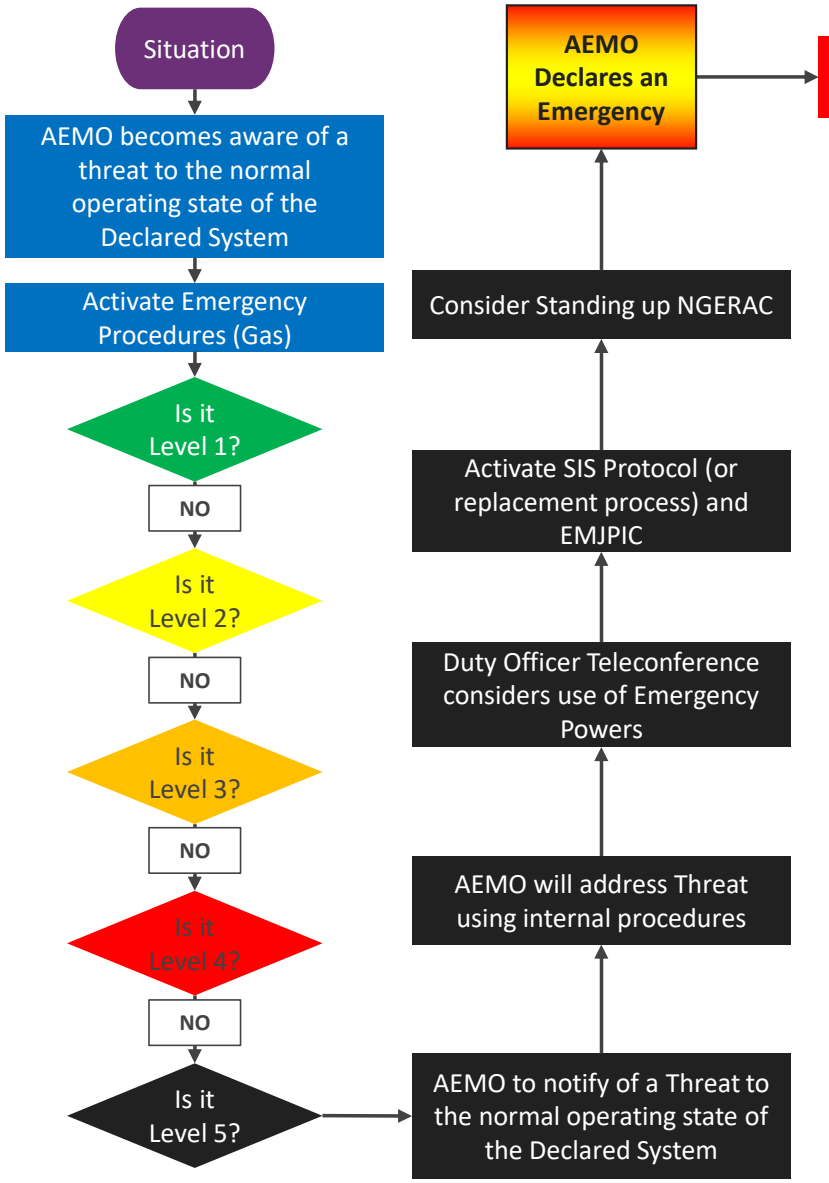
Activate Emergency Procedures (Gas)
Is it Level 1?
NO
Is it Level 2?
NO
Is it Level 3?
NO
Is it Level 4?
NO
Is it Level 5?
AEMO to notify of a Threat to the normal operating state of the Declared System
AEMO will address Threat using internal procedures
Duty Officer Teleconference considers use of Emergency Powers
Activate SIS Protocol (or replacement process) and EMJPIC
Consider Standing up NGERAC
AEMO Declares an Emergency
Emergency Teleconference
Seek Emergency Powers
Curtail or Safety Direction?
CURTAIL
SAFETY
Time Critical?
NO
YES
Request G-In-C Emergency Proclamation under GIA
Gazette Proclamation
Ministerial directions under GIA
ESV Declaration of Emergency Powers under 107(1A) of GSA
ESV Declaration of Emergency Powers under 107(1) of GSA
ESV Directions under GSA
Implement Directions, Curtailment, Rationing and/or Recovery Measures as per 'Gas Load Curtailment and Gas Rationing and Recovery Guidelines'
Revoke Emergency Powers, Emergency Declaration and Threat to System, when the system normalises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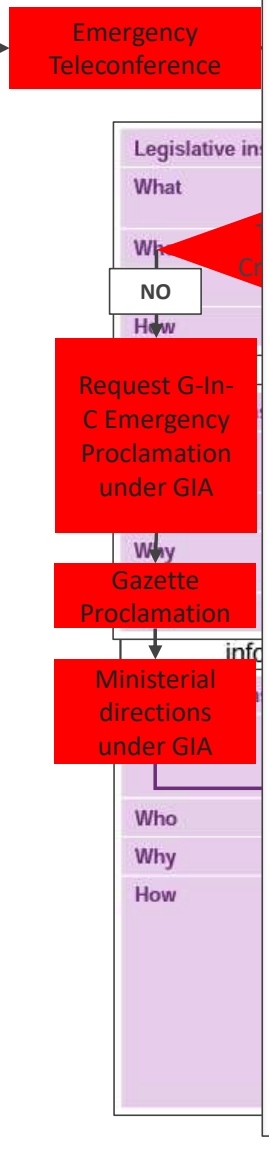
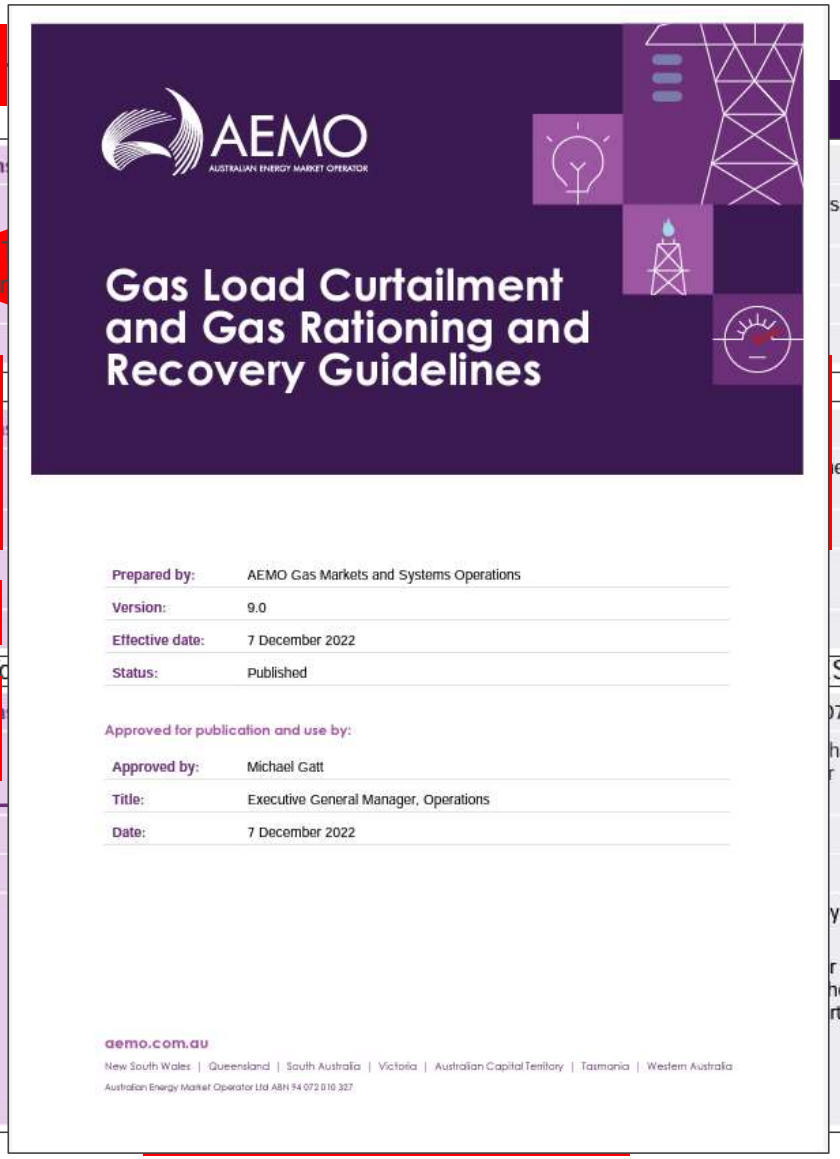
Activate SIS Protocol (or replacement process) and EMJPIC
Consider Standing up NGERAC
AEMO Declares an Emergency


Emergency Teleconference
Request G-In-C Emergency Proclamation under GIA
Gazette Proclamation
Ministerial directions under GIA
NO
Legislative in
What
Who
Why
How


AEMO
AUSTRALIAN ENERGY MARKET OPERATOR
Gas Load Curtailment and Gas Rationing and Recovery Guidelines
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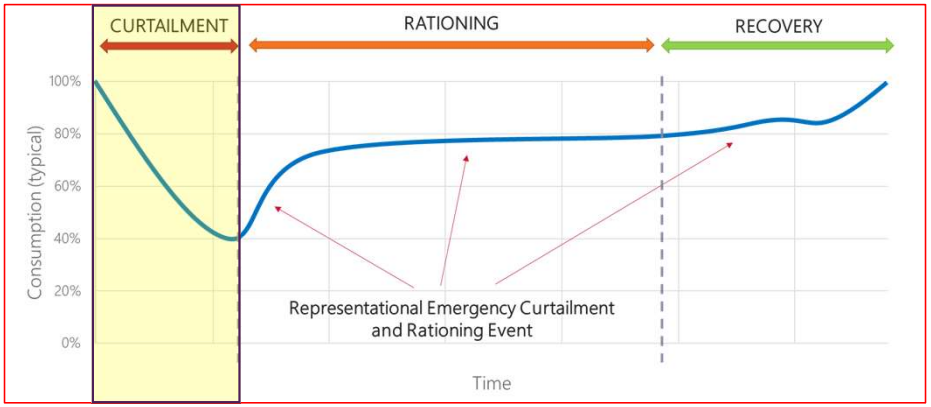
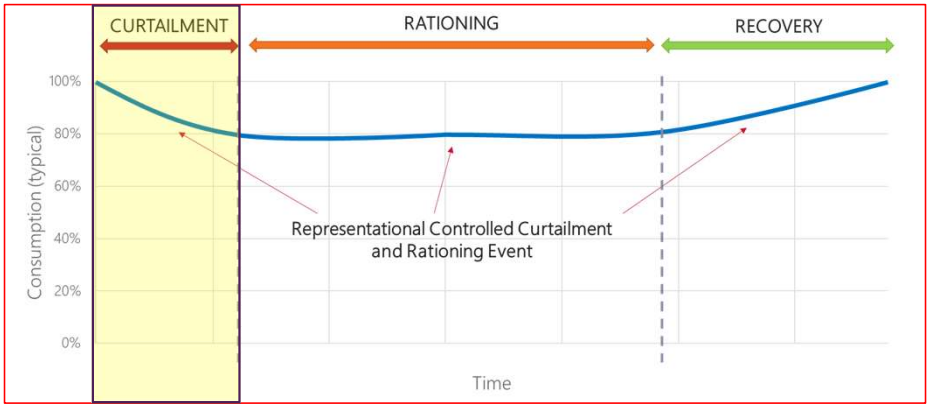
Phases





- Curtailment
  - Deliberate reduction of gas delivery or gas usage required due to a shortage of supply or because demand exceeds pipeline capacity
  - During a catastrophic event, severe and immediate measures used to arrest the fall in pressure to remain above the minimum (nose diving plane)
  - In less severe situations (or those with greater lead time) it is used in a more considered manner to bring demand down to a sustainable level (gradual reduction of altitude)

Curtailment types

- Voluntary Reduction
  - Reduction of demand through community goodwill
    - No obligation or enforcement
    - Unpredictable response
    - Questionable duration
- Directed Restrictions
  - AEMO directions to DTS participants using NGL 91BC
    - Predictable response and reduction
    - Enforceable obligation
    - Limited Audience and becoming less effective in peak season
- Mandatory Restrictions
  - Government Emergency Powers (ESV and/or DEECA)
    - Applicable to anyone/anything in Victoria
    - Enforceable, but limited visibility to facilitate
    - Directed mainly towards domestic customers
    - Ultimately reliant of end user response as limited/no physical control
    - Different fines under GIA and GSA

Curtailment enactment timings

- Voluntary Reduction
  - Implementation of Emergency Powers not required
  - Quickest to enact when dealing with Domestic Consumers
  - Limited only by the speed by which the message can be disseminated and the speed by which consumers can implement reductions…if they do
- Directed Restrictions
  - A permanent power maintained by AEMO which is quick to enact, but limited to only Market Participants, not Domestic Consumers
- Mandatory Restrictions
  - Requires enacting Emergency Powers which can take significant time
  - ESV uses Gas Safety Act and doesn't need to be gazetted
  - DEECA use Gas Industry Act and requires G-In-C approval and gazetting
  - Rules of thumb = ESV less than 24 hrs, DEECA more than 24 hrs