Upstream energy in South Australia 2025

Chris Cubitt

November 2025

GEOLOGICAL SURVEY OF South Australia

DISCOVERY DAY

Agenda

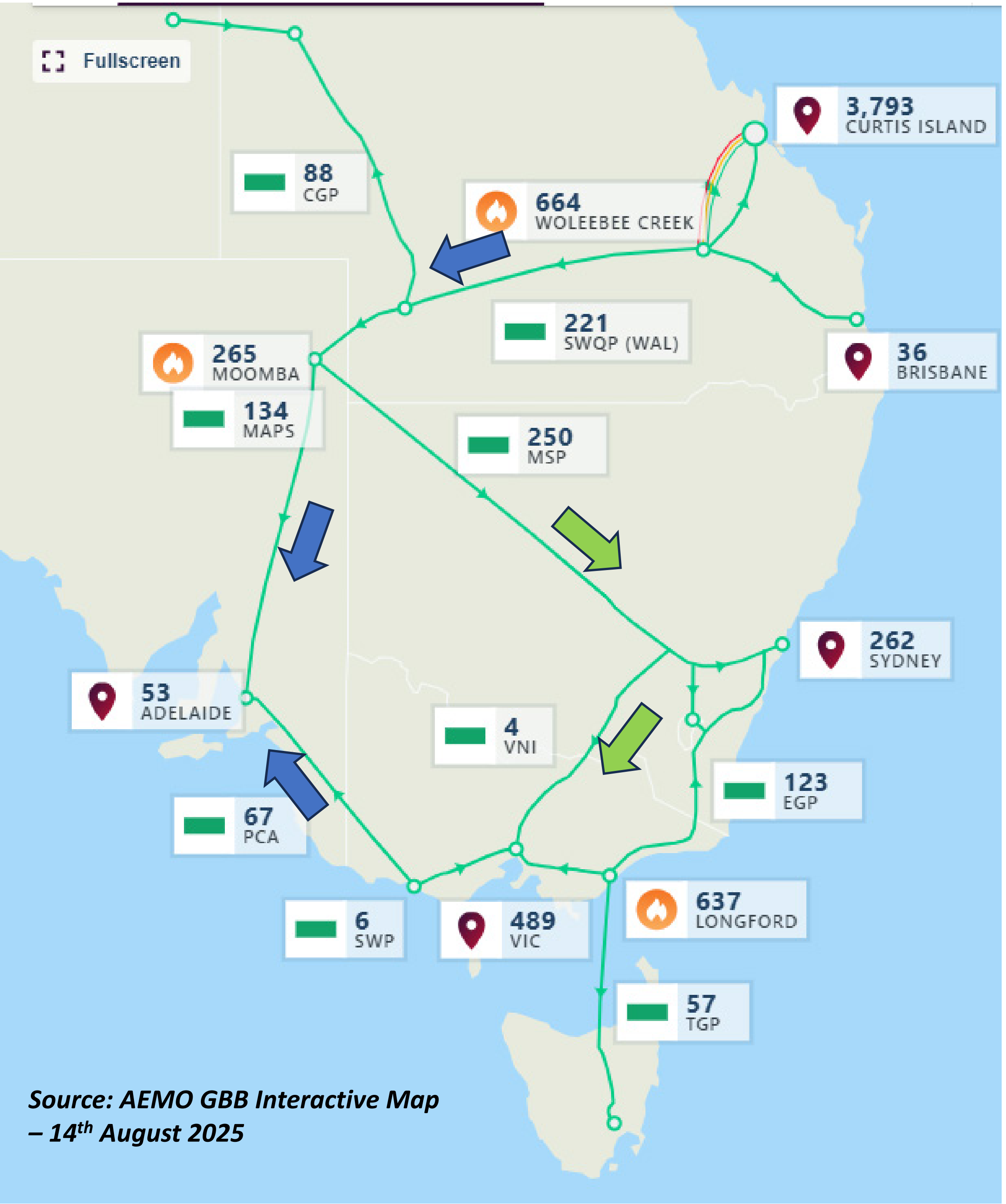
Setting the scene…….

- The Australian and SA contexts
- How much gas does SA consume?
- Electricity generation mix in SA
- Why is gas so important to SA?
- Where does SA's gas come from/go?
- SE Australia's gas supply gap

What is being done

- Australian exploration summary
- LNG importation into SA, NSW & Vic(?)
- The energy team's "more gas" projects
- Moomba CCS update
- Natural hydrogen update

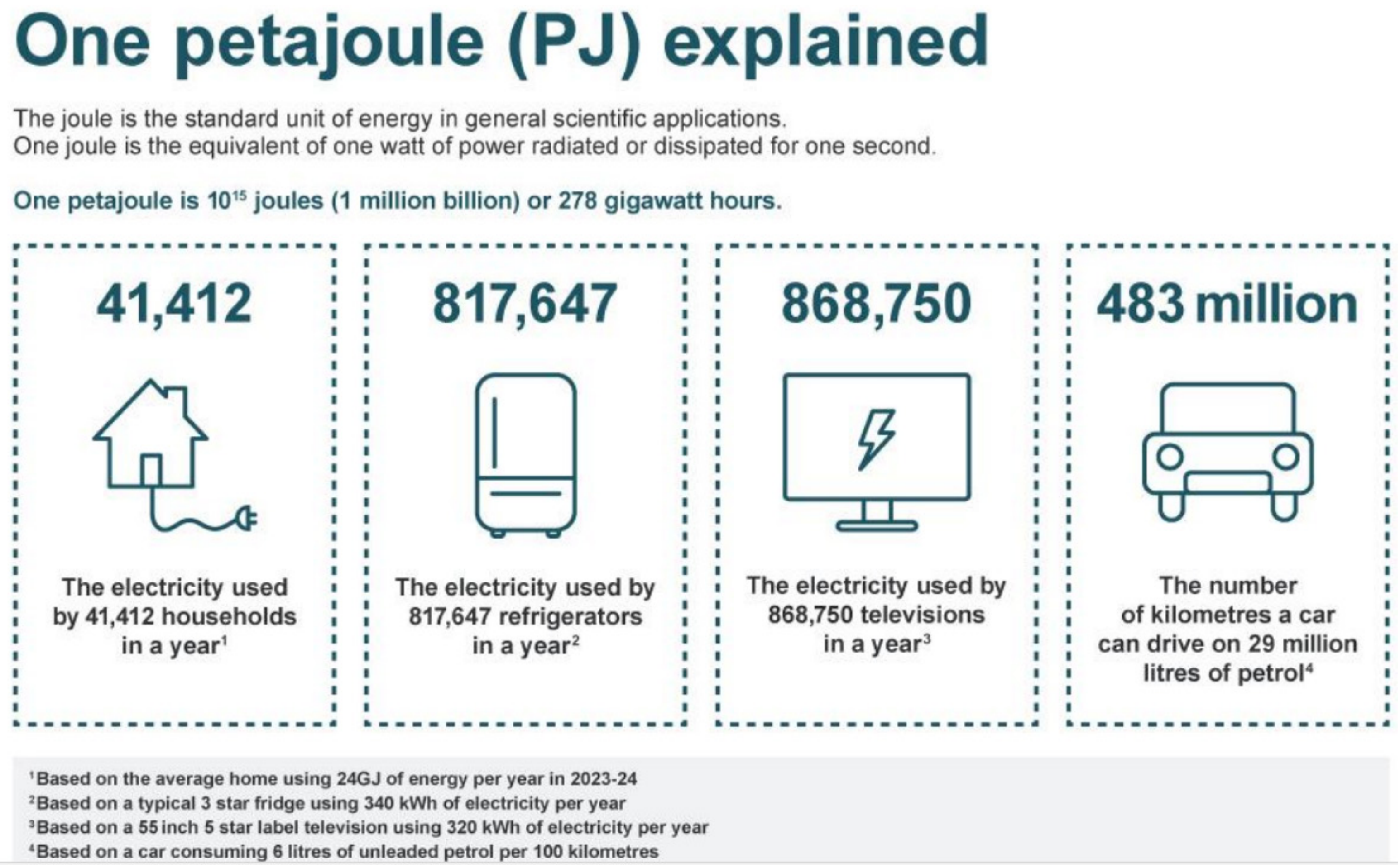
Summary



Source: AEMO GBB Interactive Map – 14th August 2025

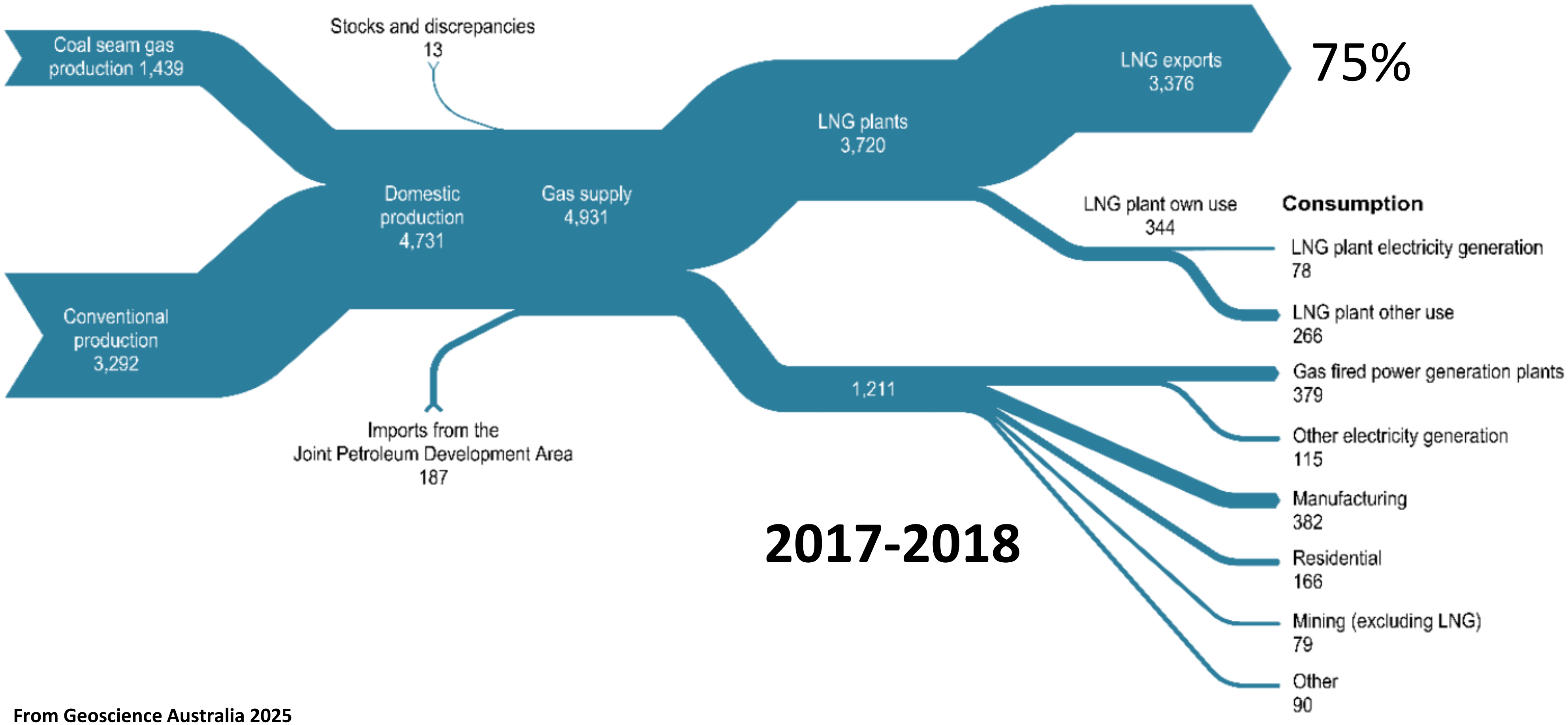
Key words

- <u>One Petajoule (or PJ)</u> is roughly equivalent to one billion cubic feet (or 1 BCF) of gas
- <u>1 BCF</u> of *onshore* sales gas (SE Australia) is currently worth ~AUD$12,000,000.
- <u>Raw gas</u> is what comes out of our gas wells (methane, CO_2, H_2S etc). Raw gas is processed in a refinery to produce sales gas
- <u>Sales gas</u> is typically methane (CH_4) which is transported in our pipelines and LNG tankers
- <u>Domgas</u> = domestic gas



Source: Australian Government Dept of Climate Change, Energy the Environment and Water – Australian energy Statistics – update report 2025

Demand: Australian gas flows



From Geoscience Australia 2025

Gladstone LNG QLD - From Santos 2025

Torrens Island SA - From AGL 2025

Mt Barker SA - From Adelaide Hills Gas 2025

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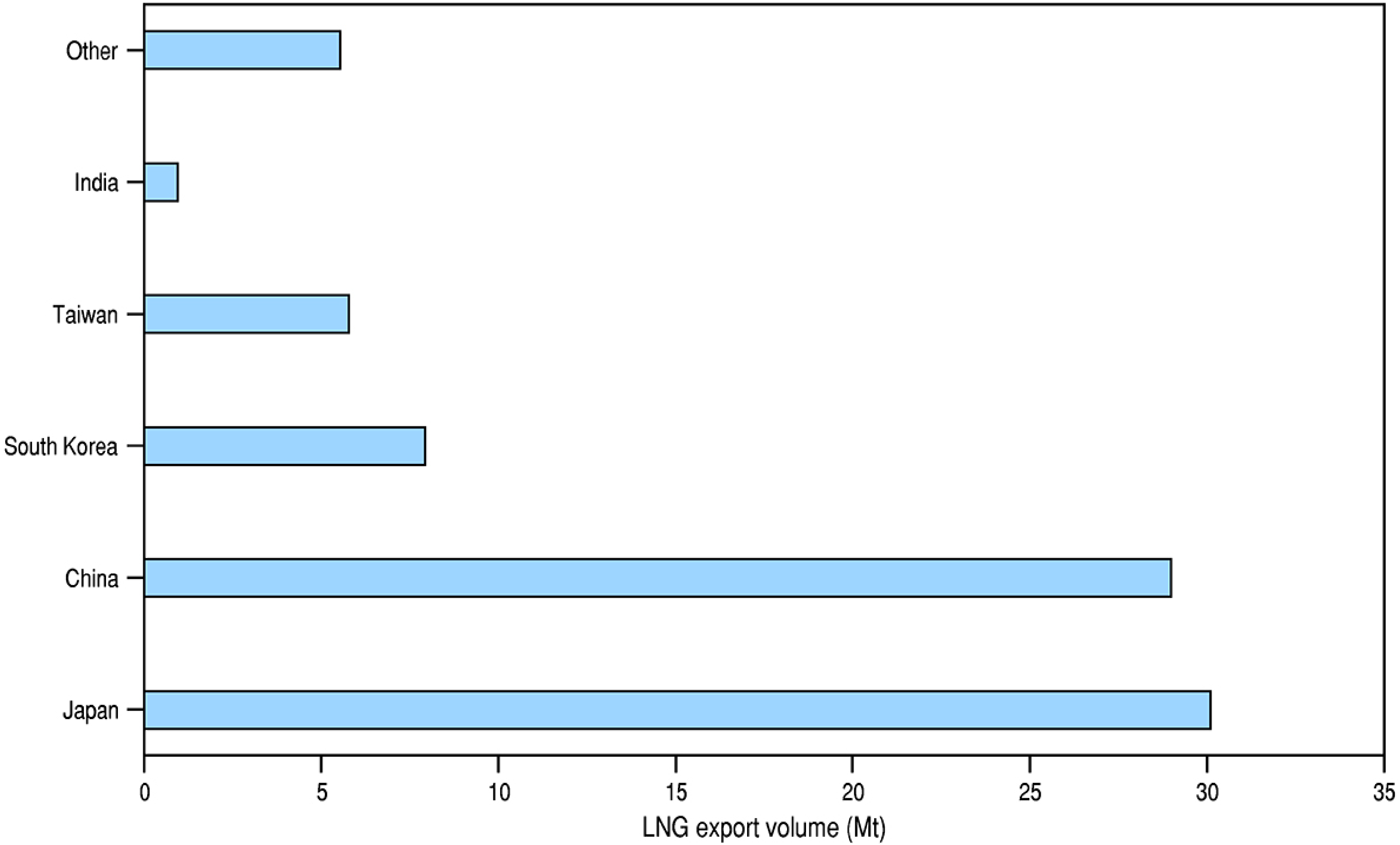
Australia's export LNG to ....

- Our Asian neighbours are our biggest customers
- Critical long-term 25yr contracts that underpin economies
- 43% of Japan's gas supply comes from Australia (66% of it is coal!)
- 40% of South Korea's gas supply



From Geoscience Australia 2024

Sources: Department of Industry, Science, Energy and Resources estimates 2020, Office of the Chief Economist, Resources and Energy Quarterly - December 2020, Table 38.
Note: Other = all other countries. LNG = liquefied natural gas. Mt = million tonnes.

AECR 2.11

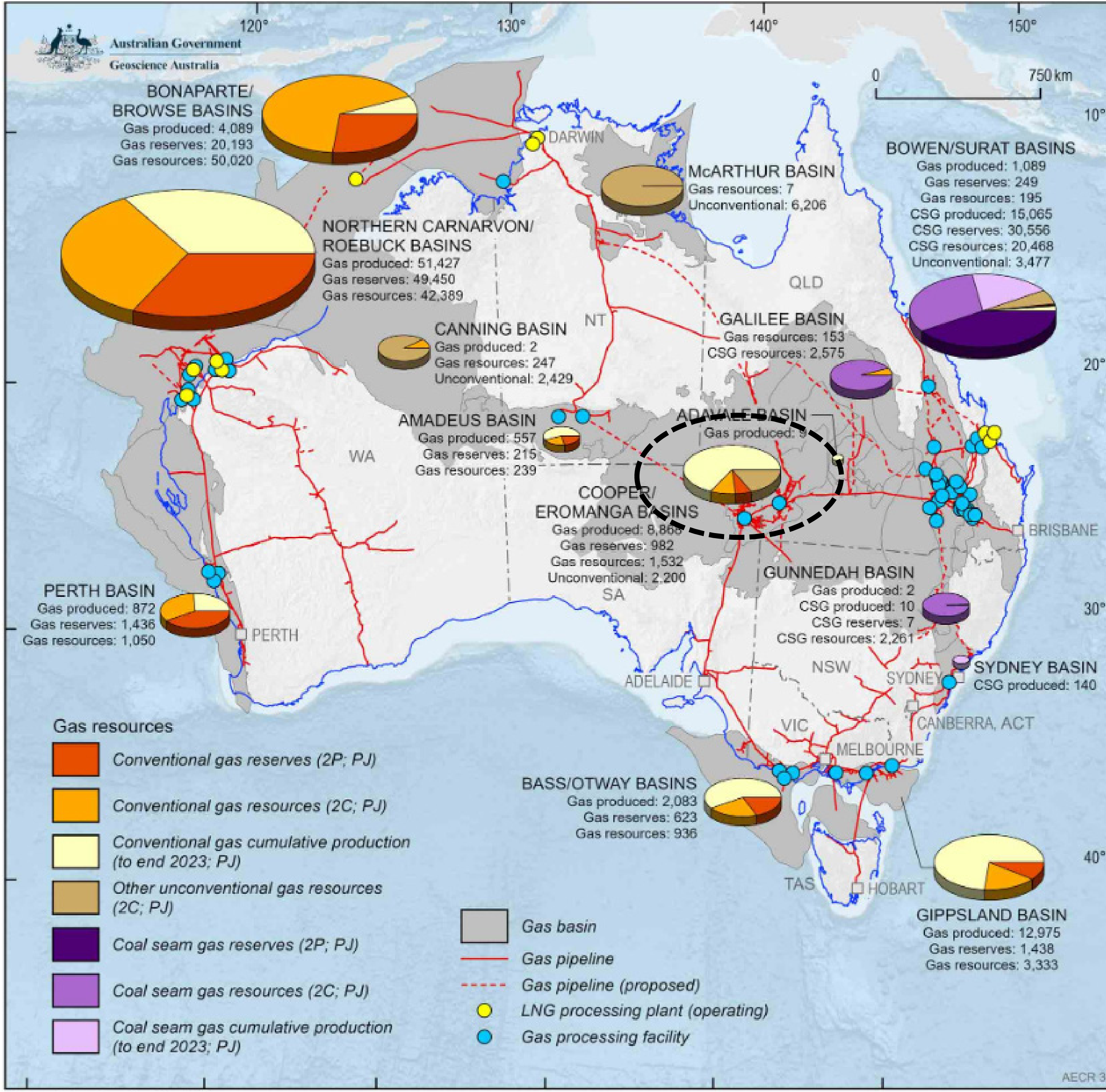
Australia's remaining gas reserves and resources

- Offshore Western Australia dominates Australia's remaining conventional gas reserves (mostly exported)

- Onshore Queensland dominates Australia's remaining coal seam gas reserves (mainly domgas & exports)

- Note the production volumes in the Cooper, Otway and Gippsland basins are all mature with new exploration needed to bring gas to pipe

SA consumption

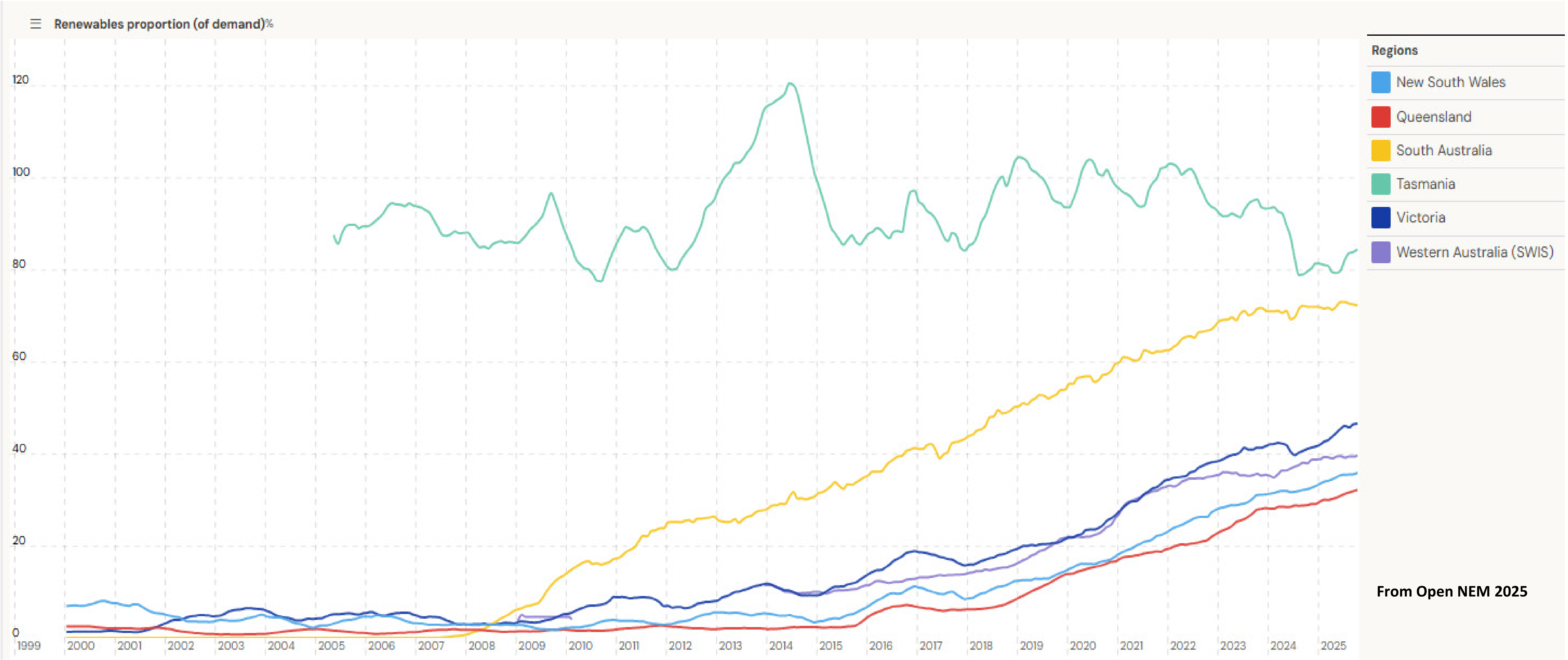


Sources: Geoscience Australia; GPInfo.
Pipeline routes from the GPInfo petroleum database.
Note: LNG = liquefied natural gas, PJ = Petajoules.

From Geoscience Australia 2025

Figure 3.1 Australia's remaining gas reserves (2P) and contingent resources (2C) during 2023 and cumulative production to end 2023 (PJ). For physical units (Tcf) refer to Table 3.1 Table 3.2 and Table 3.3

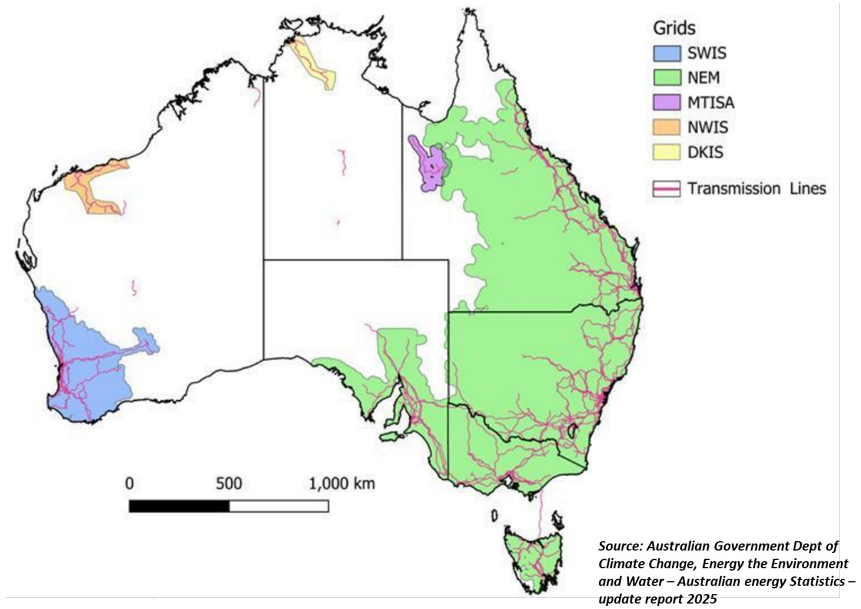
Australia's renewables proportion: a steady increase



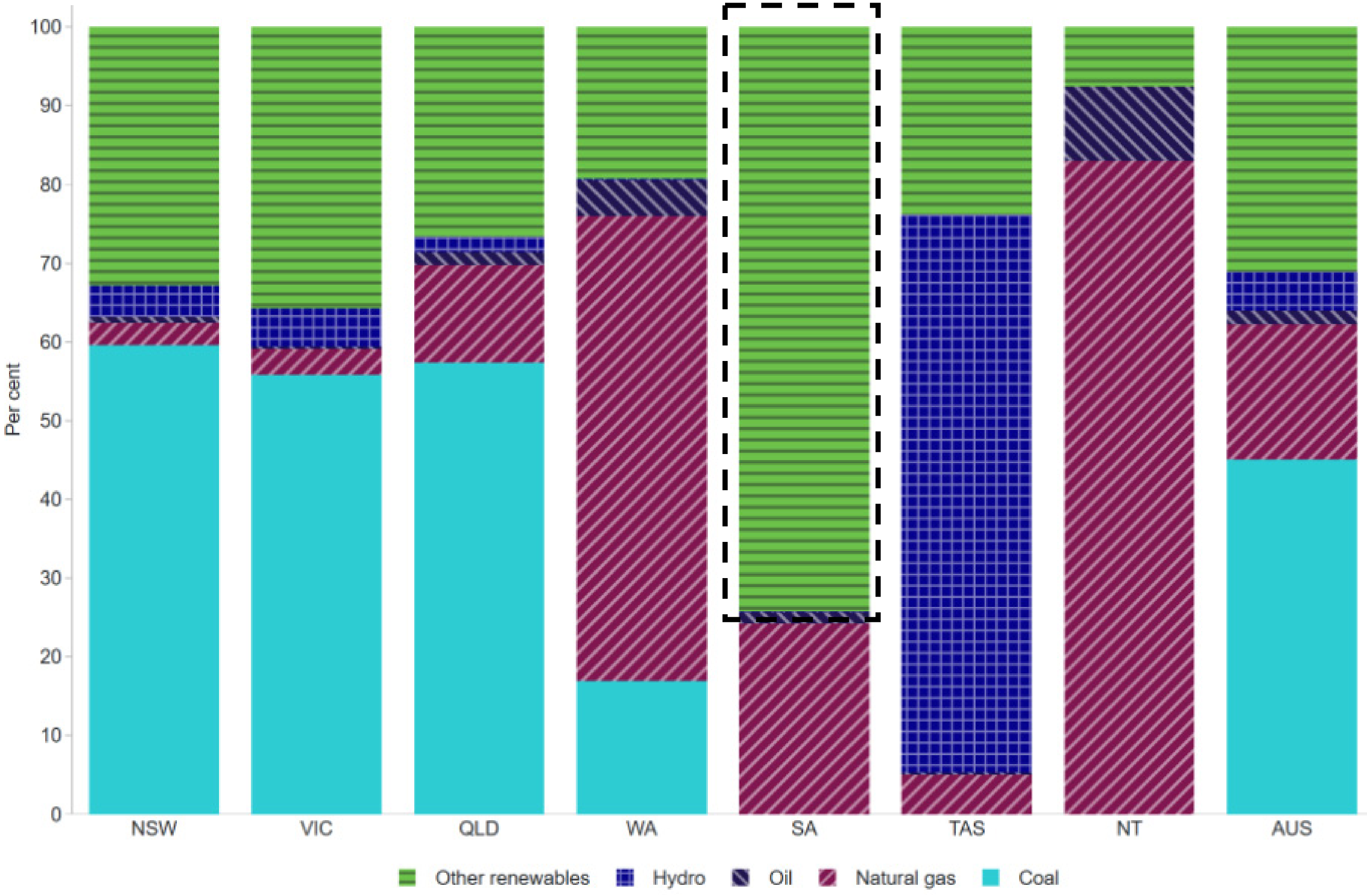
From Open NEM 2025

Electricity generation by fuel, Australian states 2024

The NEM is the National Electricity Market. That is the East Australian states without NT or WA as there are no interconnections



Source: Australian Government Dept of Climate Change, Energy the Environment and Water – Australian energy Statistics – update report 2025

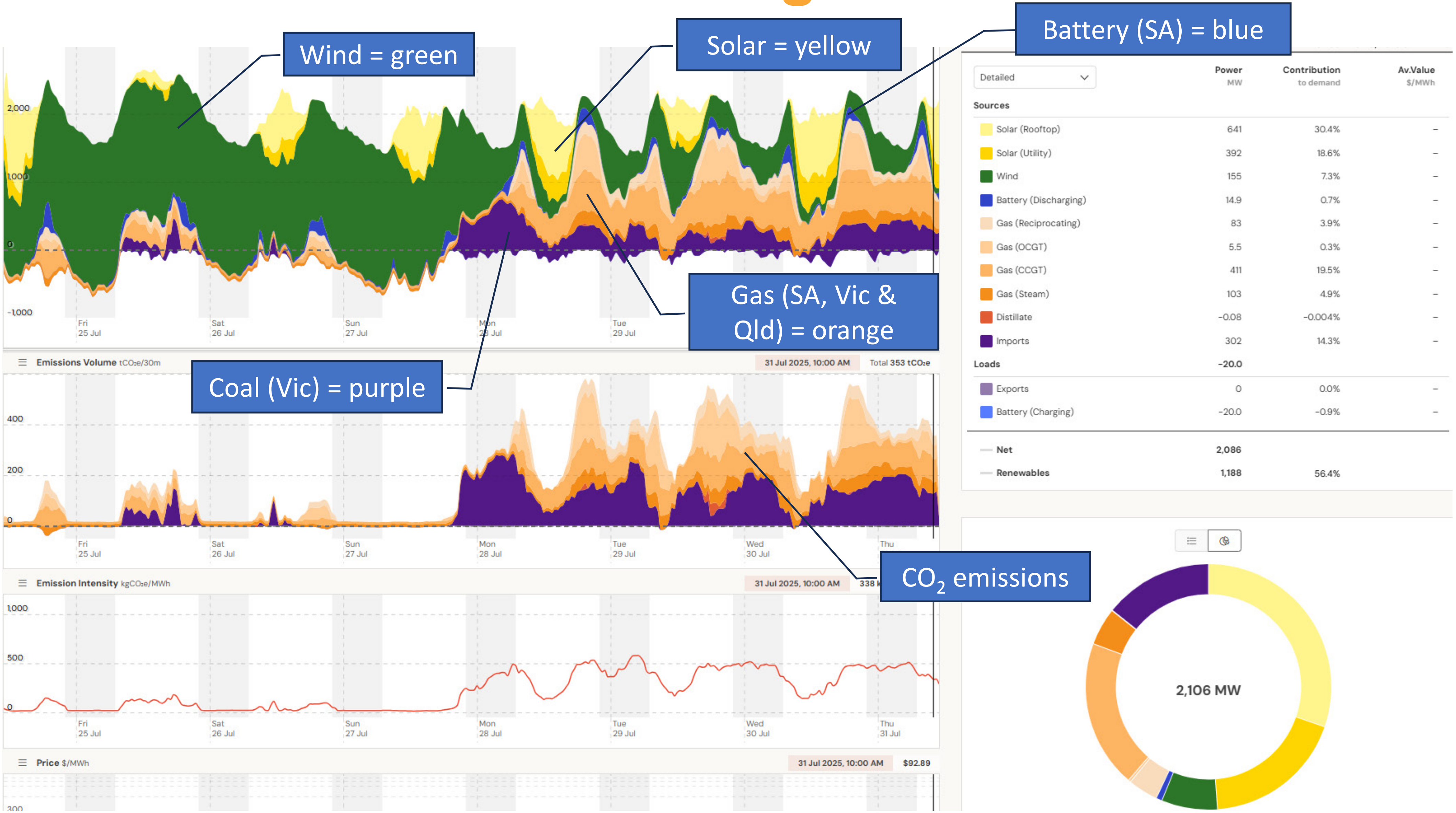


Source: Australian Government Dept of Climate Change, Energy the Environment and Water – Australian Energy Statistics – update report 2025

South Australia: electrical generation mix in 2025

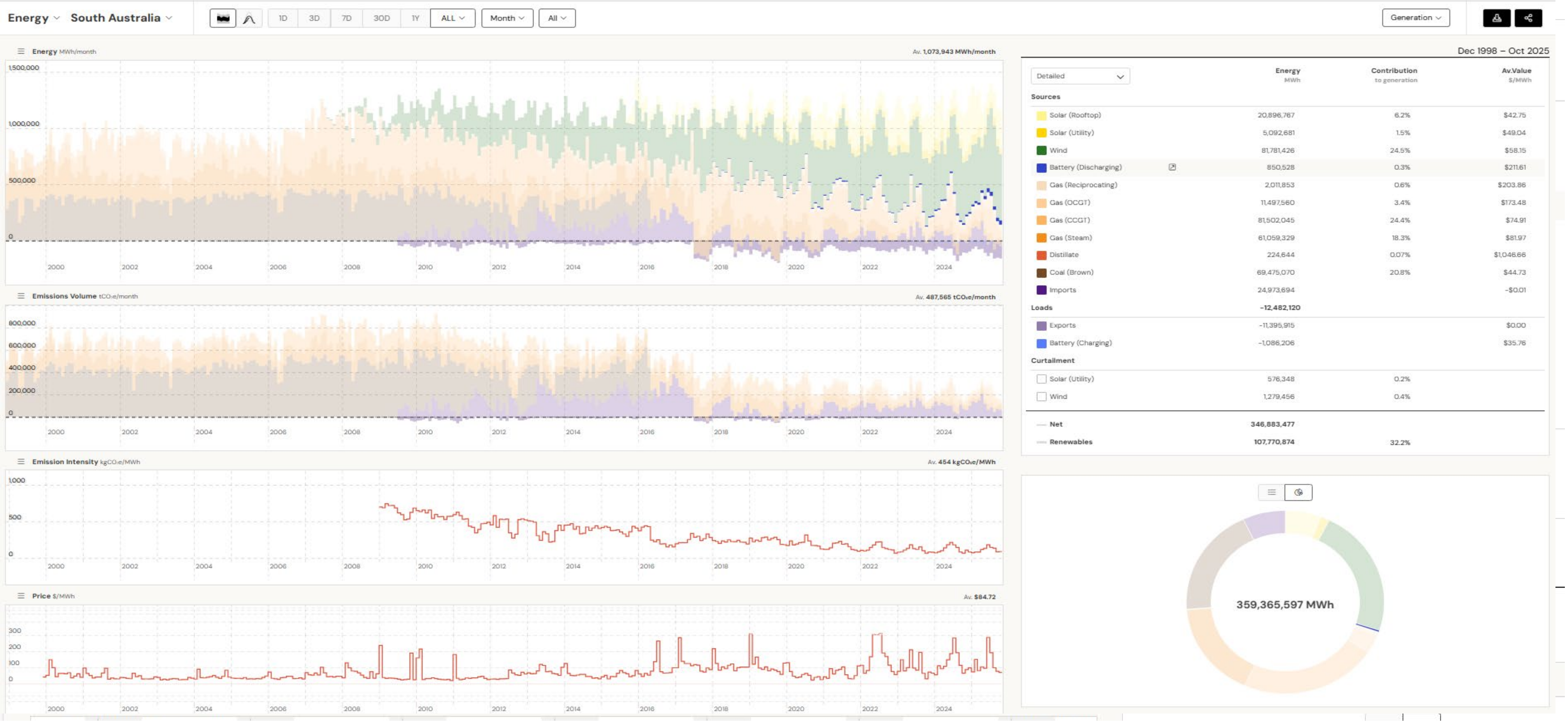
Detailed	Power MW	Contribution to demand	Av.Value $/MWh
Sources			
Solar (Rooftop)	641	30.4%	–
Solar (Utility)	392	18.6%	–
Wind	155	7.3%	–
Battery (Discharging)	14.9	0.7%	–
Gas (Reciprocating)	83	3.9%	–
Gas (OCGT)	5.5	0.3%	–
Gas (CCGT)	411	19.5%	–
Gas (Steam)	103	4.9%	–
Distillate	-0.08	-0.004%	–
Imports	302	14.3%	–
Loads	**-20.0**		
Exports	0	0.0%	–
Battery (Charging)	-20.0	-0.9%	–
Net	**2,086**		
Renewables	**1,188**	56.4%	

South Australia: electrical generation mix in 2025



South Australia’s battery storage: steadily increasing capacity

Currently at 3% of the state’s total output (max discharge is 11%)



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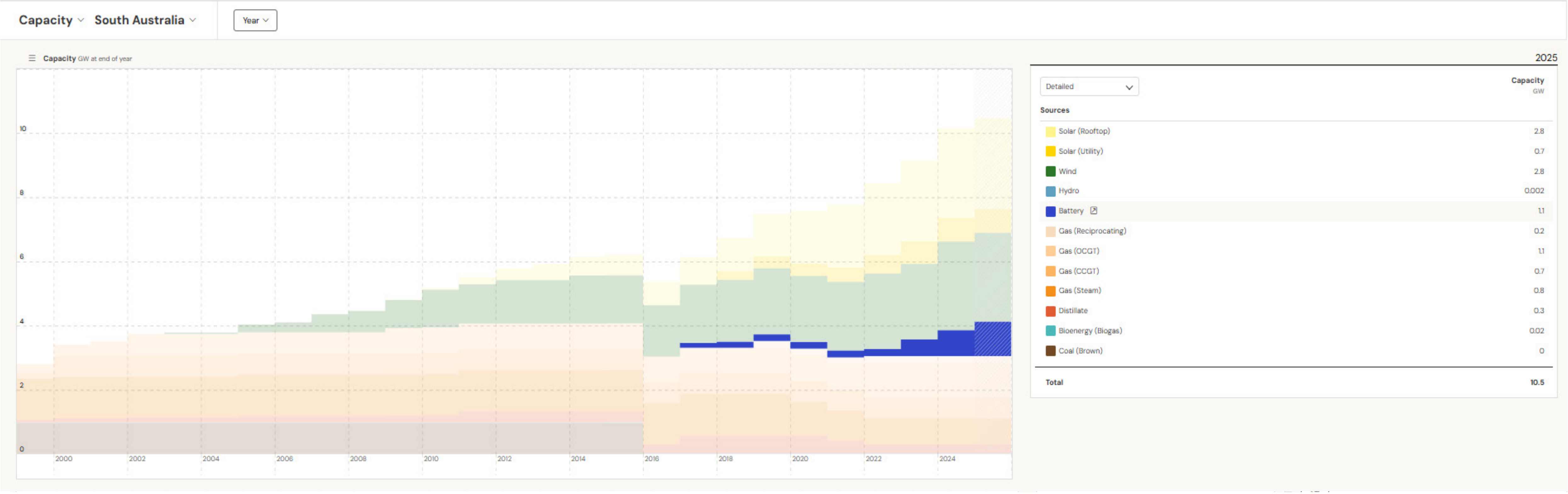

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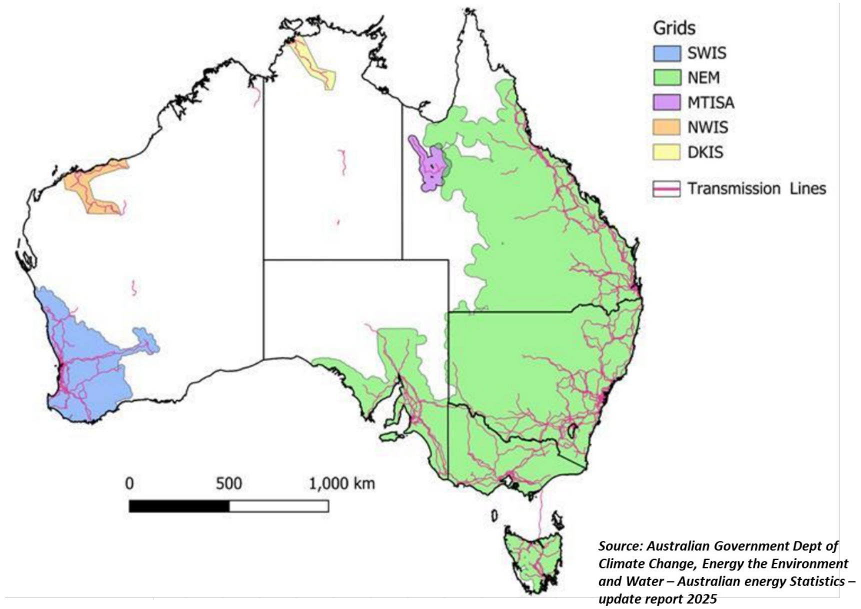

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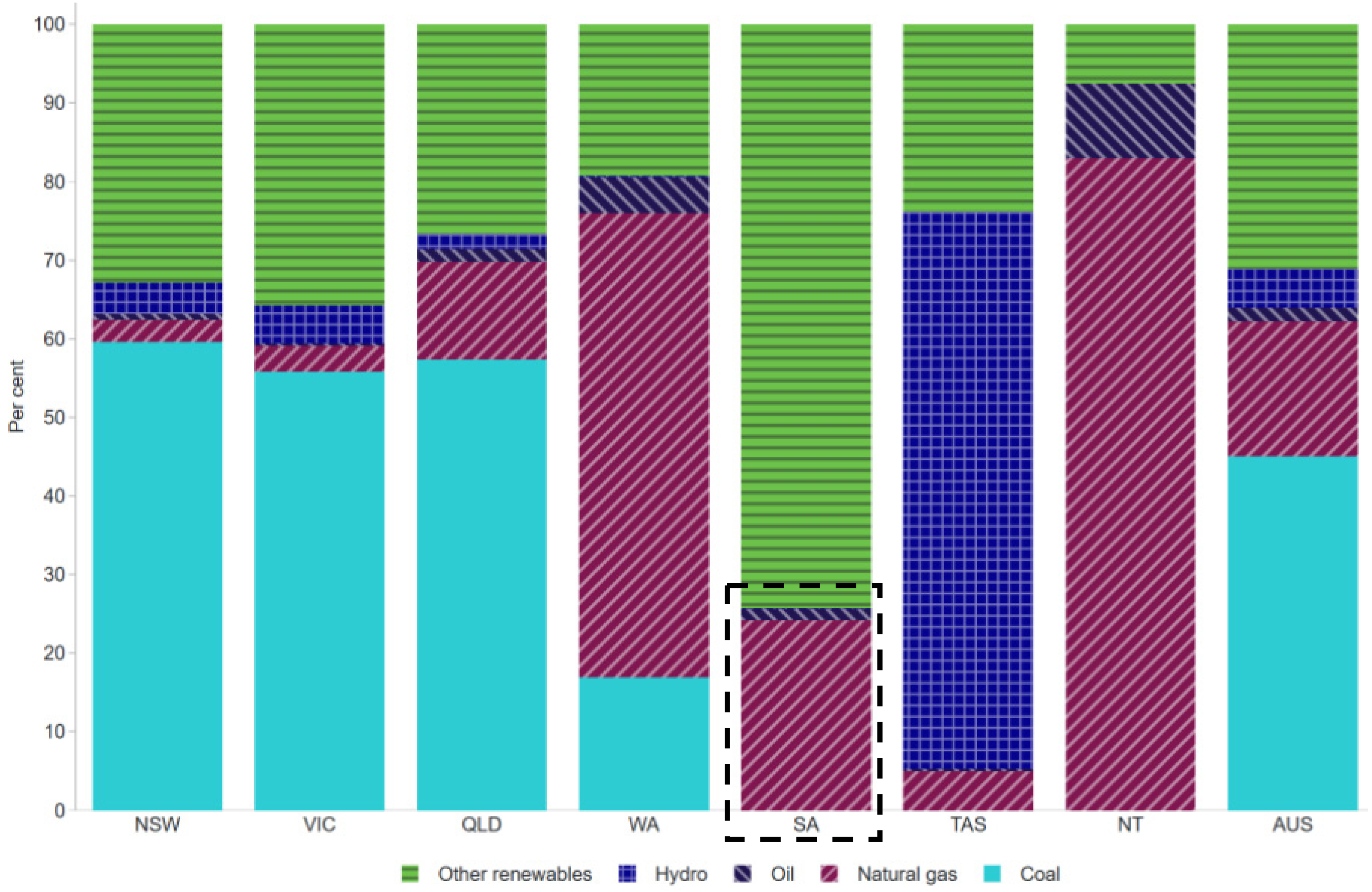


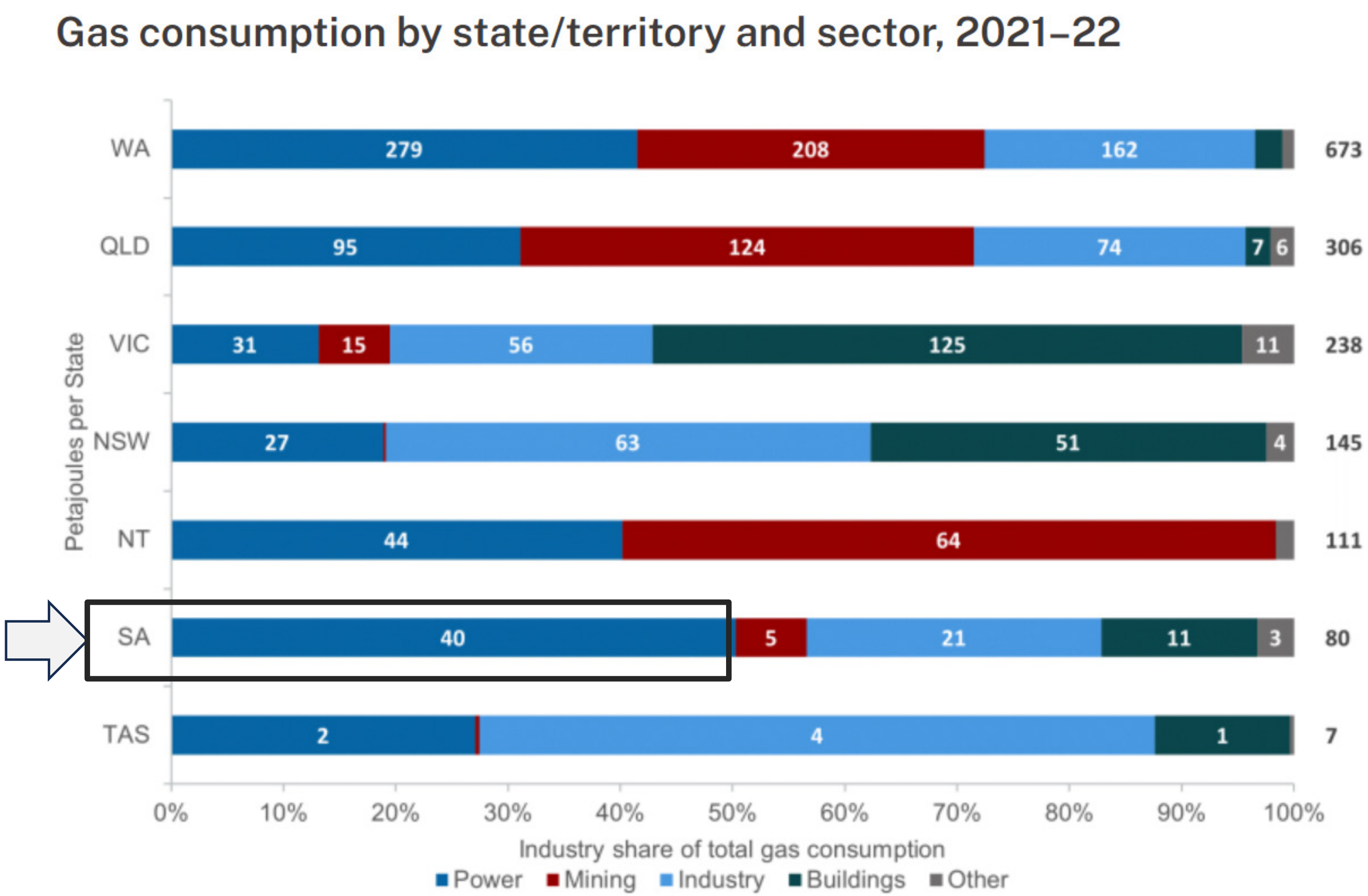
Source: Australian Government Dept of Climate Change, Energy the Environment and Water – Australian Energy Statistics – update report 2025

Gas consumption by sector

- In South Australia, 40% of our gas is consumed for electricity generation. The highest % in Australia

- SA is 10% of Australia's population and consumes 5% of Australia's gas

- BTW gas consumption in SA’s mining is small in comparison to the other resource states NT, Qld & WA (maroon colour fill)



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Source: Australian Government Dept of Industry, Science and Resources 2025

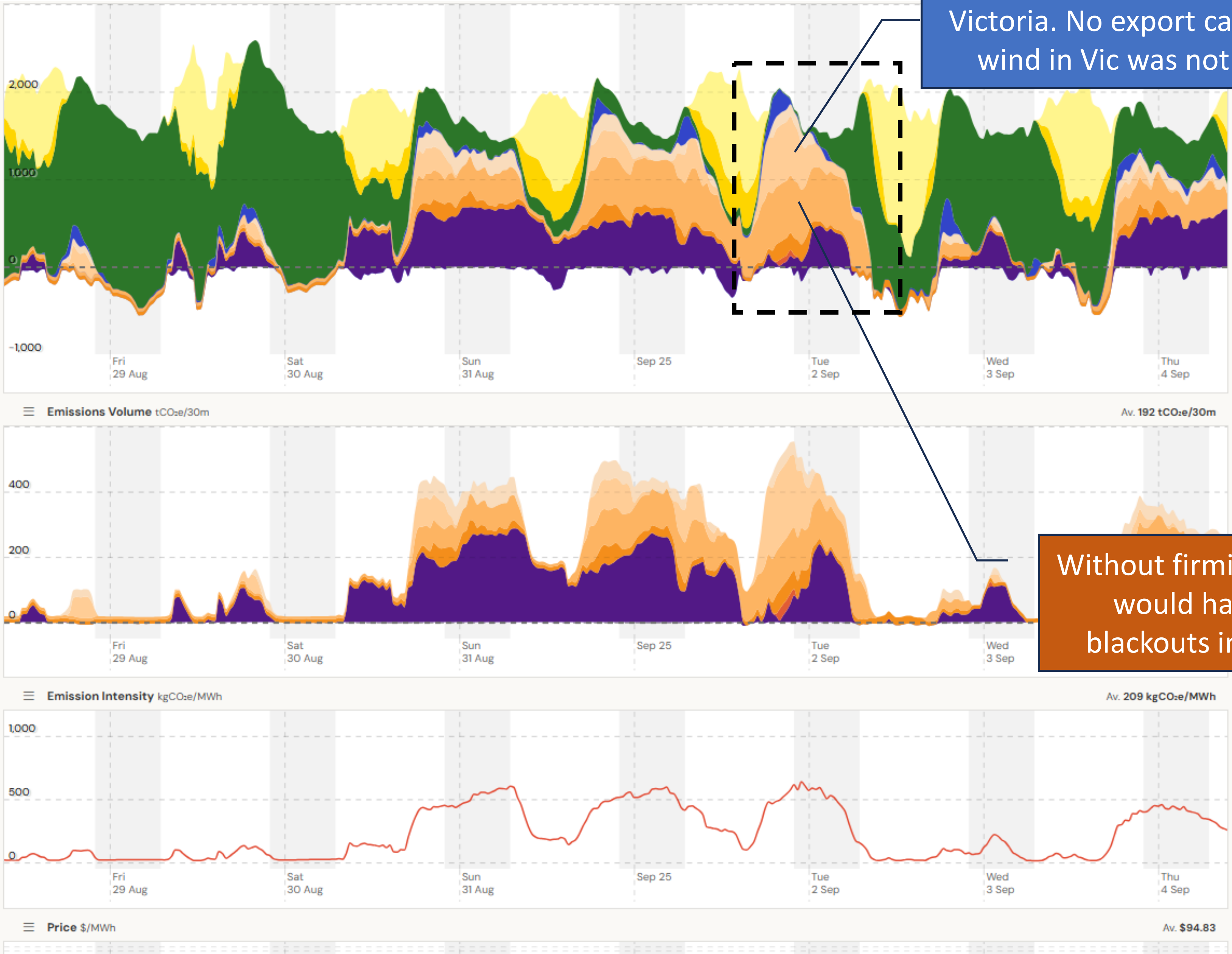
Why gas is important for SA

Adelaide Show week 2025

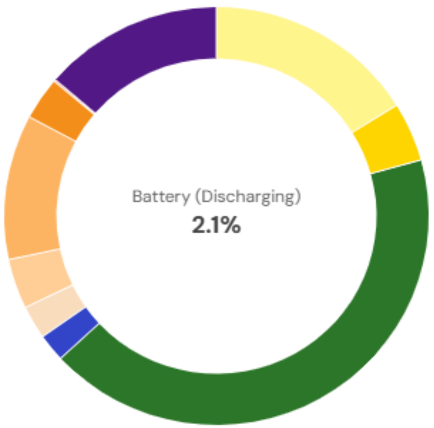
Friday Aug 29 to Thursday Sept 4

No coal electricity coming from Victoria. No export capacity as the wind in Vic was not producing

Without firming gas there would have been blackouts in Adelaide



	Energy GWh	Contribution to demand	Av.Value $/MWh
Solar (Rooftop)	53	15.6%	$0.71
Solar (Utility)	14.7	4.3%	$30.10
Wind	140	41.3%	$36.17
Battery (Discharging)	6.8	2.0%	$161.40
Gas (Reciprocating)	8.2	2.4%	$170.47
Gas (OCGT)	12.5	3.7%	$252.25
Gas (CCGT)	37	10.9%	$178.83
Gas (Steam)	10.7	3.1%	$121.51
Distillate	0.2	0.06%	$470.01
Imports	45	13.2%	$118.56
Loads	19.3		
Exports	11.3	3.3%	$4.14
Battery (Charging)	8.1	2.4%	$26.89
Net	346		
	208	65.6%	



Source: Open NEM 2025

SA electricity generation in summer: Mid Feb 2025

Source: Open NEM 2025

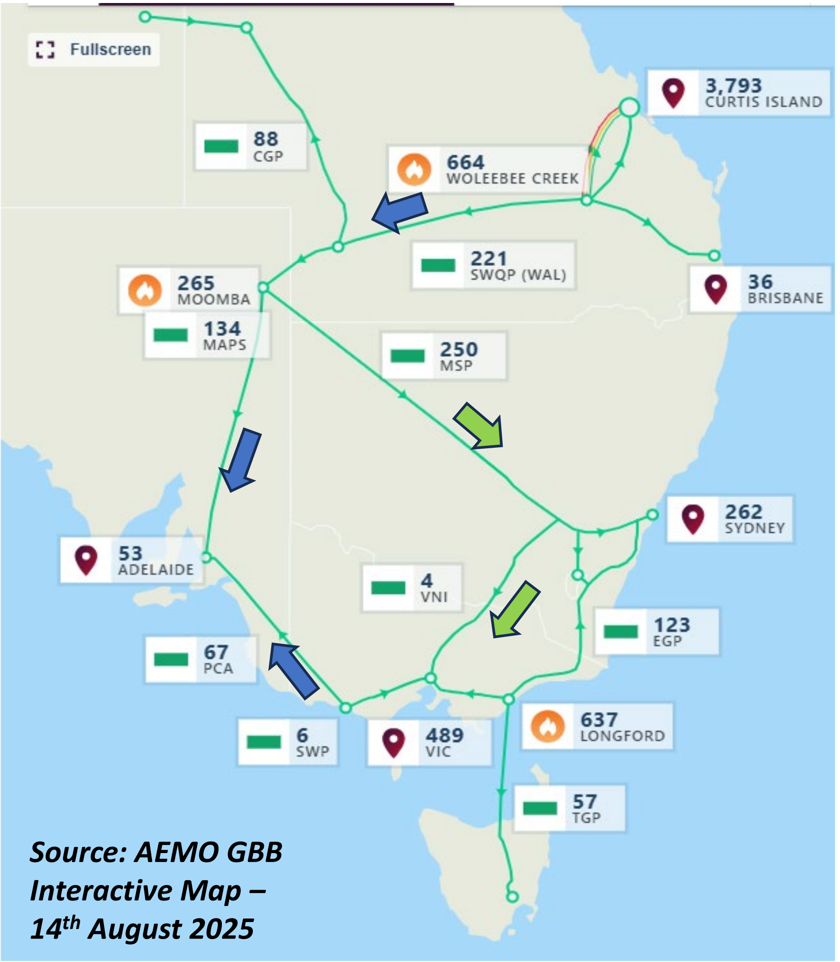
Where does SA's gas come from? Where does it go?

Outbound away from SA (green arrows): <u>75% of SA's produced sales gas is exported</u>

- NSW (most)
- Victoria

Inbound sales gas into SA (blue arrows)

- SA Cooper Basin
- Qld Cooper, Bowen and Surat Basins
- Victorian Otway and Gippsland Basins



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LOCATION	SUPPLY (TJ)	DEMAND (TJ)	NET (TJ)
QLD	4,284	4,457	-173
NSW	0	342	-342
SA	259	141	118
VIC	720	266	455
TAS	0	22	-22
NT	56	51	5
TOTAL	5,319	5,279	40

Supply – this is the total production and storage that has been receipted into the various states, with the exception of Victoria where the data relates only to the Victorian Transmission System.

Demand – this is the total demand in each state with the exception of Victoria which is based on the Victorian Transmission System. Victorian Transmission System nominations are at the controllable points only and a calculation has been performed to present the uncontrollable data. Some GPG nomination data may be excluded from the demand in each state due to the aggregation methodology.
See here for more information on flows.

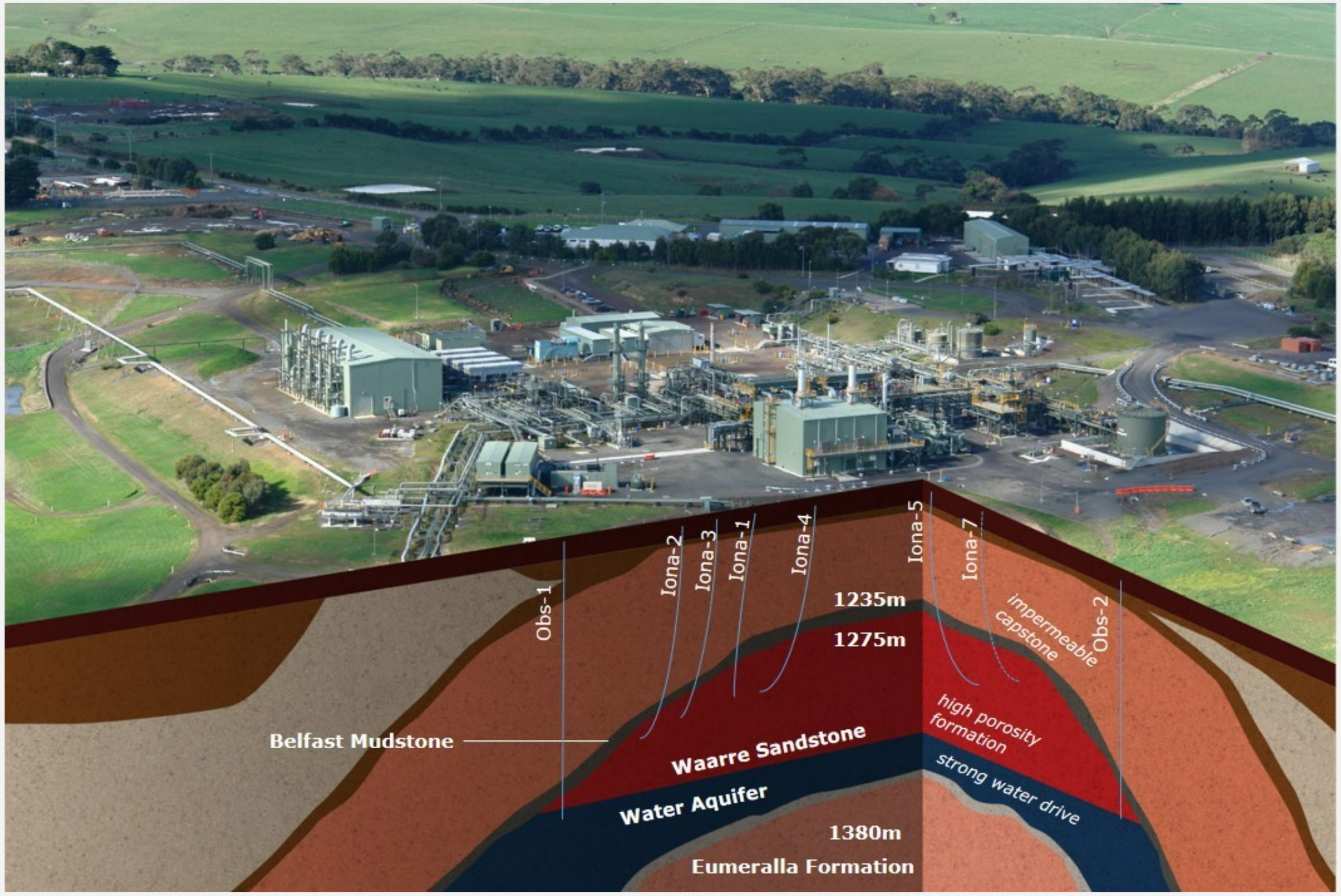
Source: AEMO GBB Interactive Map – Nov 25th 2025

Gas storage in Victoria and South Australia

- Currently SA uses sales gas stored at the Iona Field in the Victorian onshore Otway Basin to supply <u>approximately 30% SA's daily gas consumption</u>

- BUT SA has several strategic opportunities (Otway & Cooper)

- Currently a small volume of natural gas is stored in the Daralingie beds at Moomba Field



From Lochard Energy 2025

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SE gas supply shortfalls

- **There is not sufficient southern production or pipeline capacity beyond existing and anticipated projects to transport northern gas to southern markets……. OOPS!**
- ACCC forecasts daily gas shortfalls as early as 2026 with annual supply gaps from 2027 in the southern states (Gas Inquiry Interim report – June 2025)
- In 2029, southern Australian gas production is projected to decline by approximately 50% compared to 2025

Source: AEMO GBB

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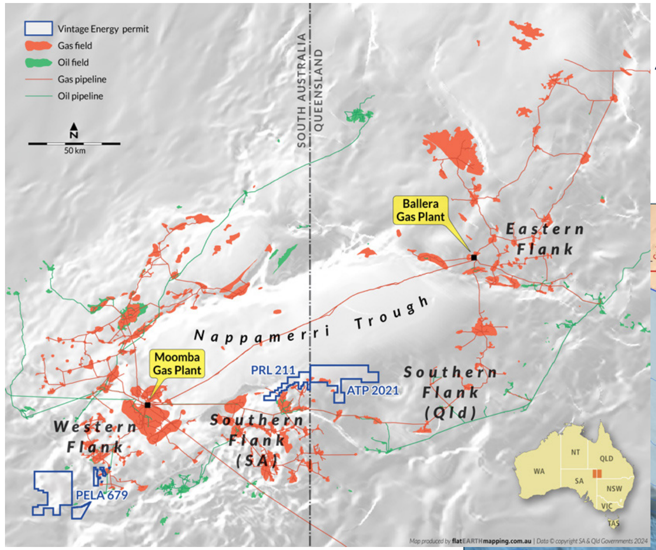
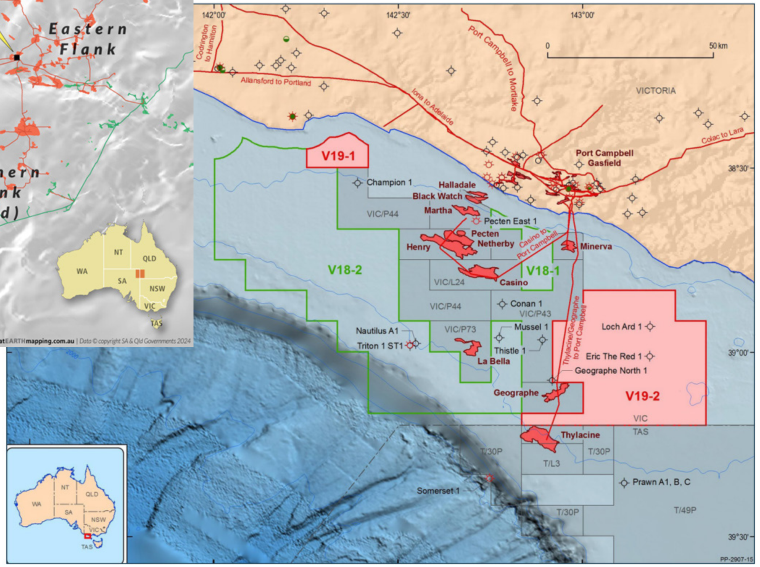
Cooper (SA & Qld)/Bowen/Surat - onshore)

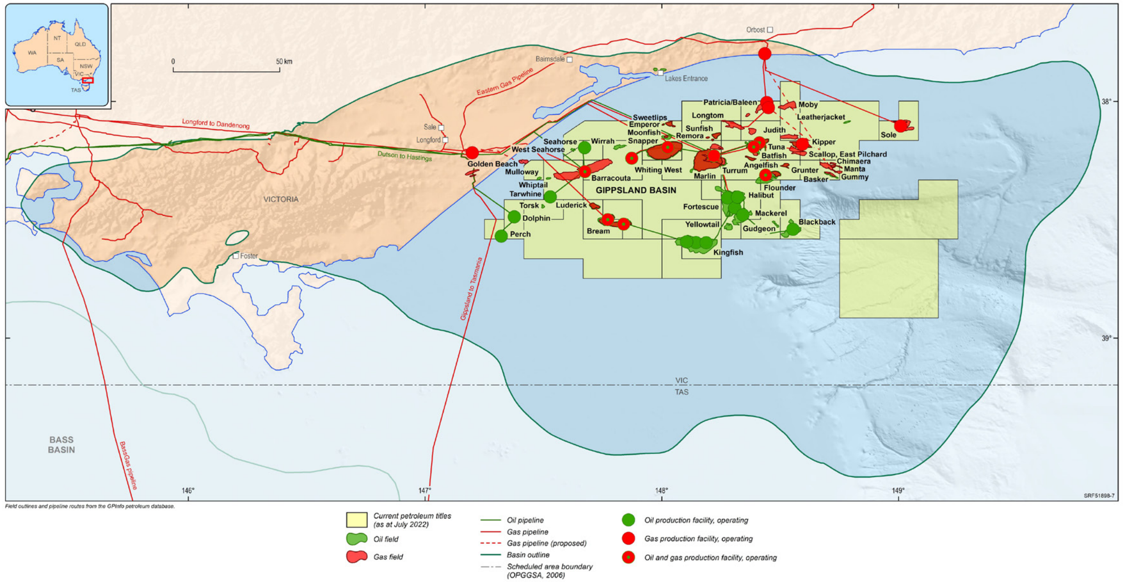


Bowen/Surat (Qld)

Tas/Vic/SA Otway (on/offshore)

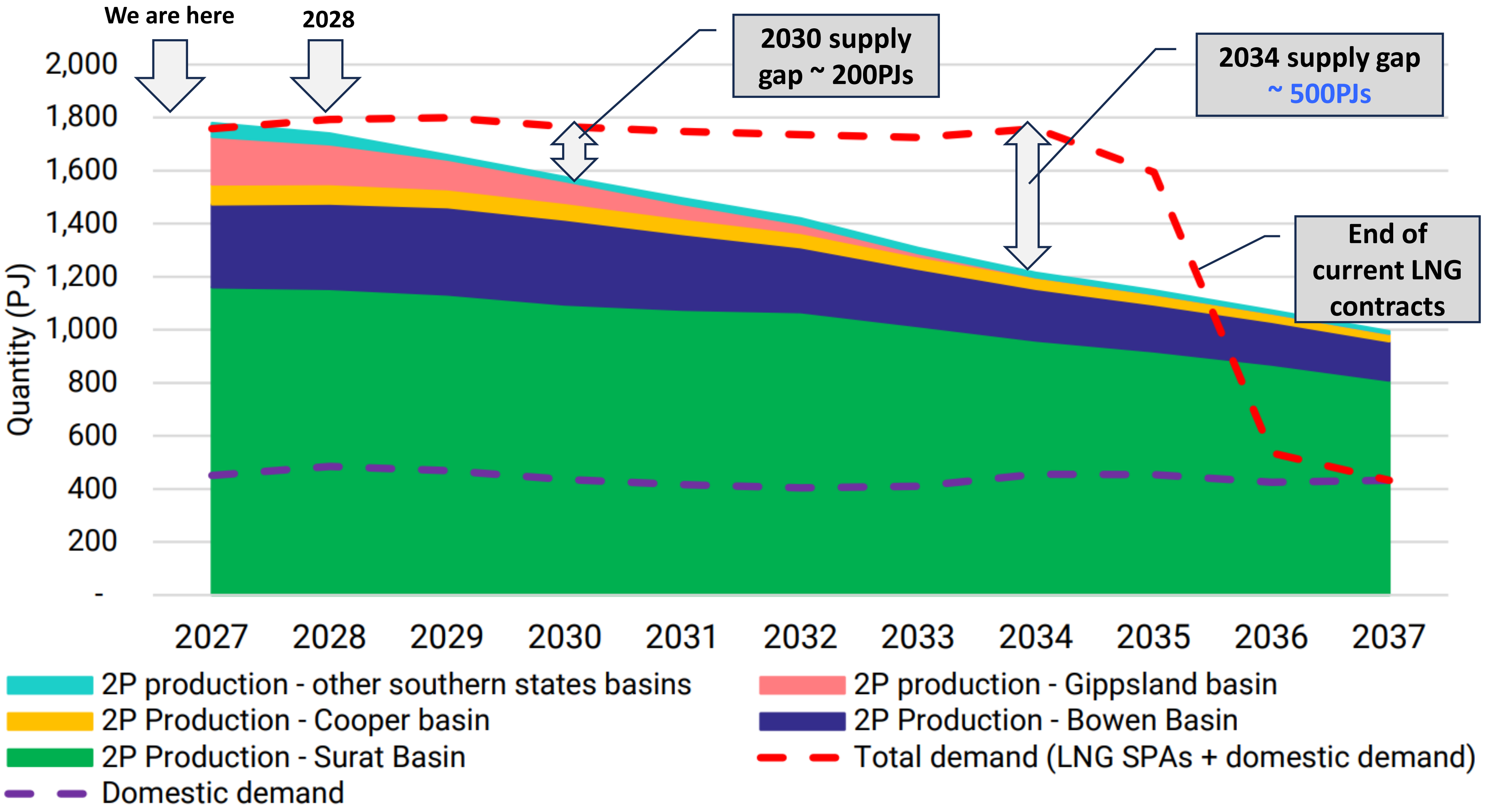


Vic Gippsland (offshore)



SE Australia: gas supply shortfall

- In 2028, will SE Australia's lights, air conditioners, heaters and fridges stay on?
- In 2028, will SE Australia's industry (including mining) have the gas they need to continue operations?



Source: ACCC Gas Inquiry 2017-2030 East Coast Gas Market (2025)

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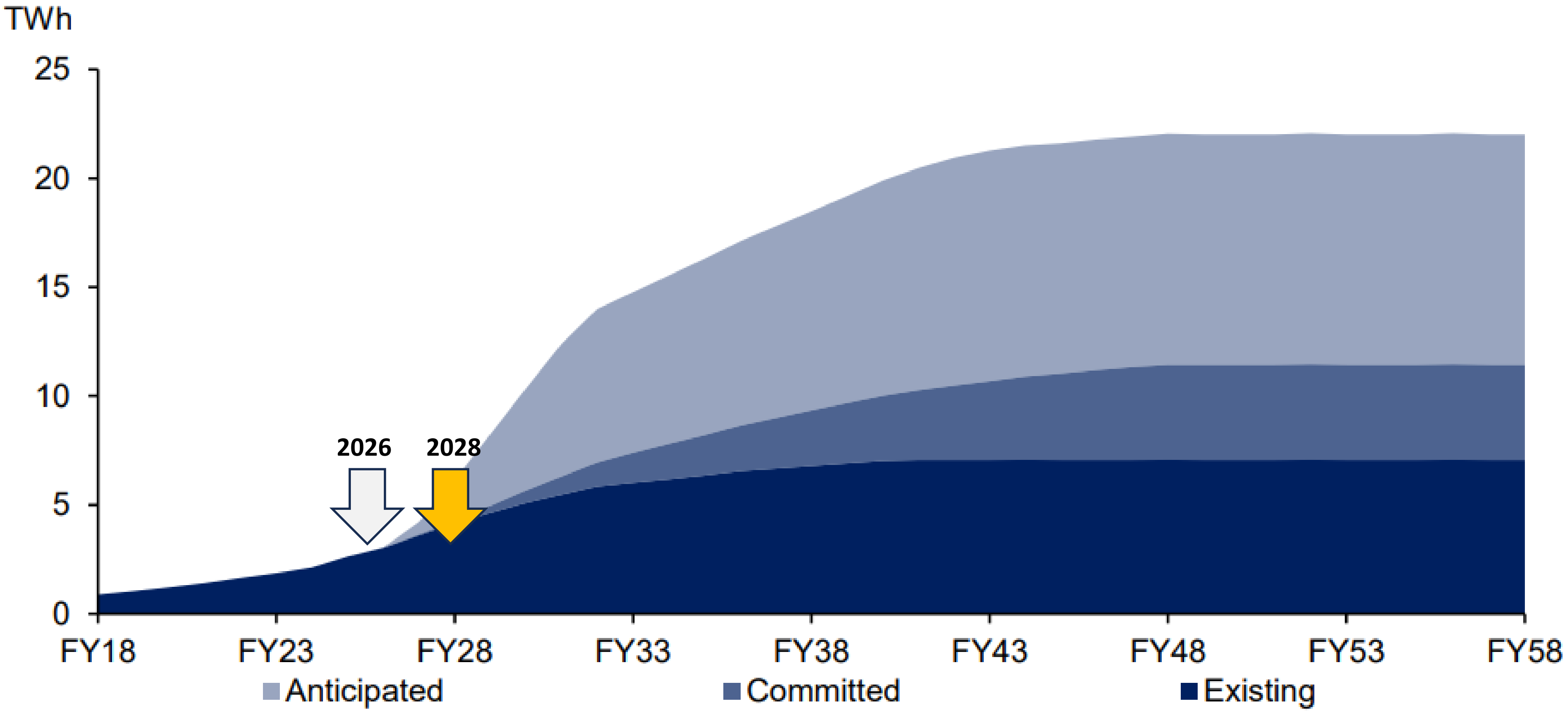
Possible future demands for SA's gas? AI data centres

AI data centre forecasted electricity demand: Sydney Example

- Remember NSW gets 30% of its electricity from gas…. from SA & Qld
- **2028 (orange arrow) is when the SE Australia gas supply gap emerges……**
- Most of the electricity generation in NSW is from black coal ➡ CO_2 emissions increase going forward



Data: AEMO data
Published: Oxford Economics - Australian data centre energy demand - final report 2025

What are we doing to find more gas? Fill the gap!

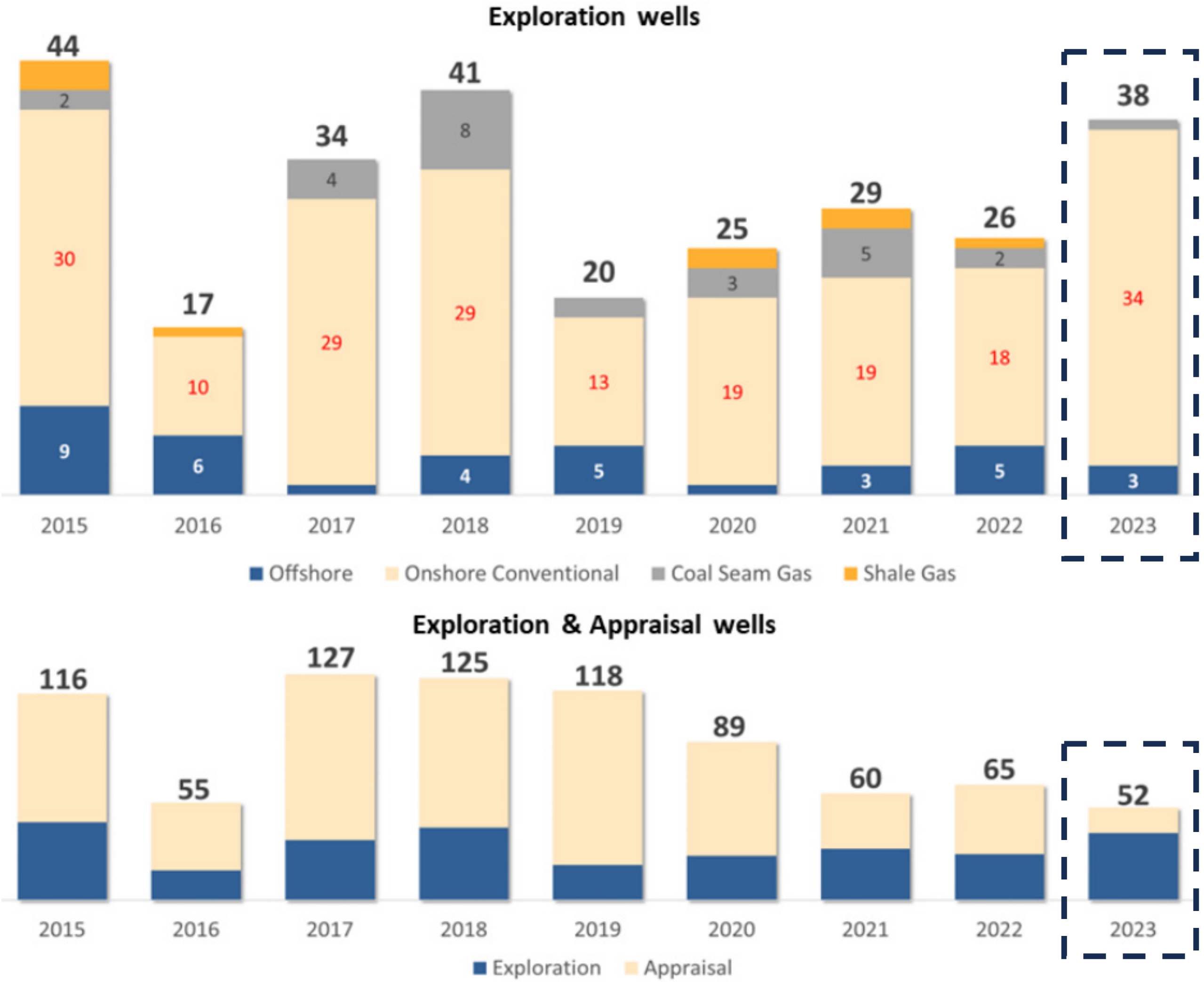
Australia exploration vs appraisal drilling 2015-2023

But remember:

- An *onshore* Australian gas well costs between AUD$4M to AUD$14M (typically 3km deep)
- An *offshore* Australian well costs between AUD$40M to AUD$60M (typically 4-5km deep)

Also, success rates:

- Globally only 20% of exploration wells are a commercial success (the Cooper is currently 30%)
- So, typically you need to drill 3-5 exploration wells to make a commercial discovery



From PESA 2024

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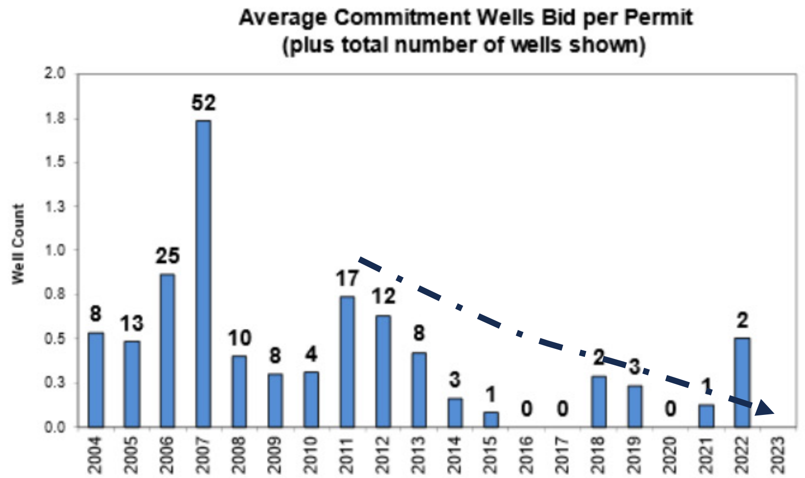
What are we doing to find more gas? Fill the gap!

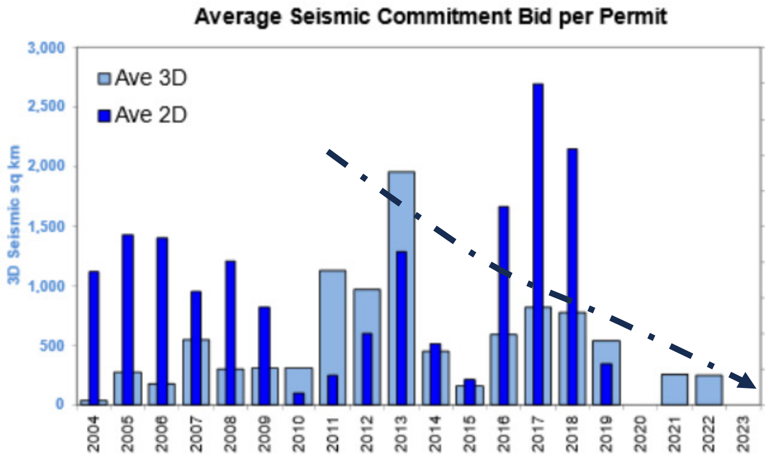
Australian Acreage Releases: 2004 – 2024 Trends

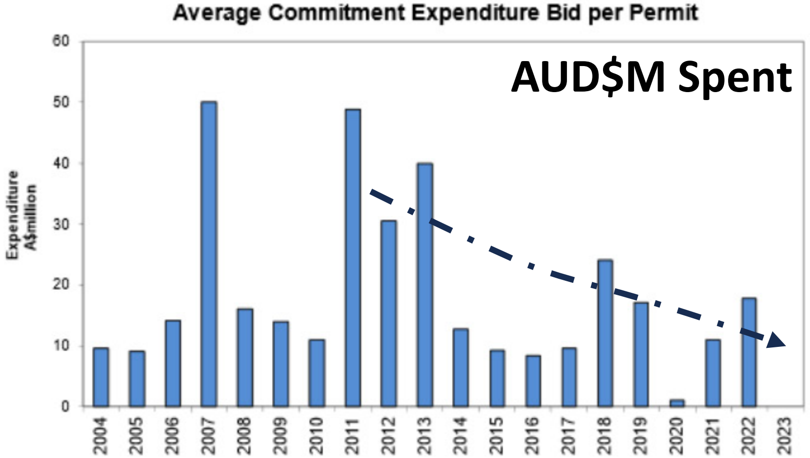
- To have exploration you need ground to explore!
- Australian governments have slowed down wrt acreage releases
- The current (2025) SA and Qld acreage releases are possibly reversing this national trend…

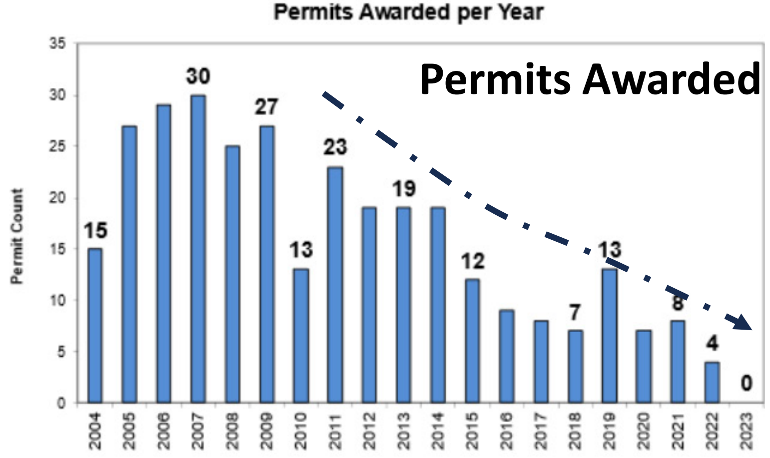
Well Count



Seismic Count







From PESA 2024

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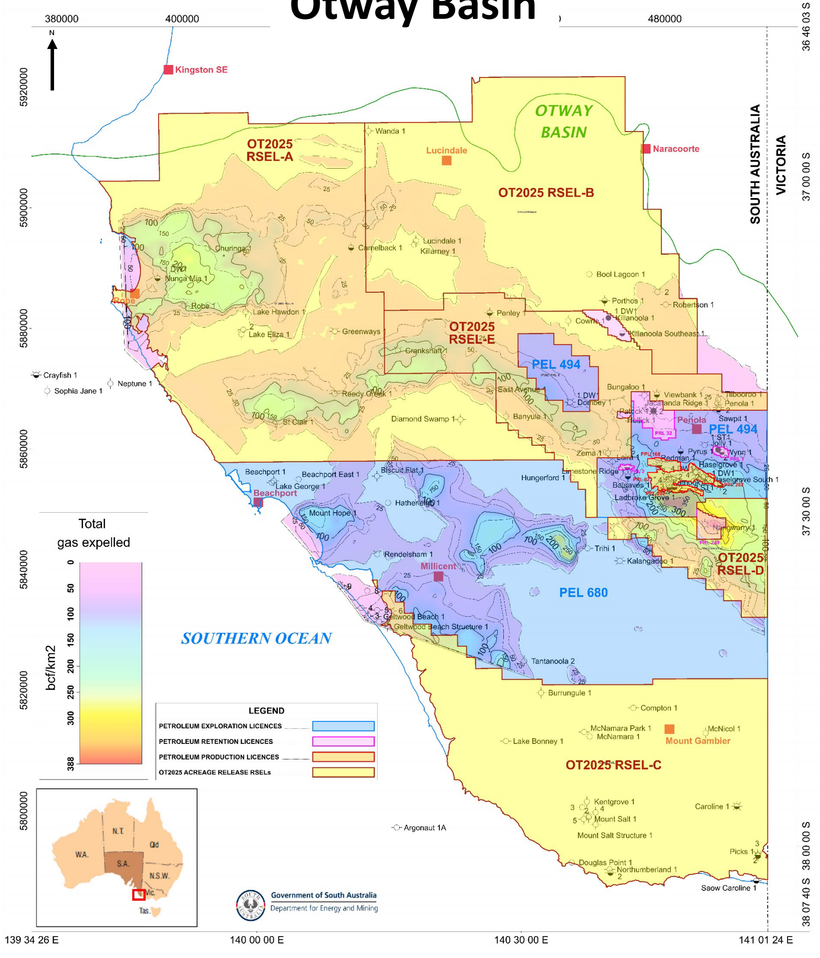
SA 2025 acreage release: Otway & Polda Basins

Announced at the 2025 AEP conference in Brisbane in May

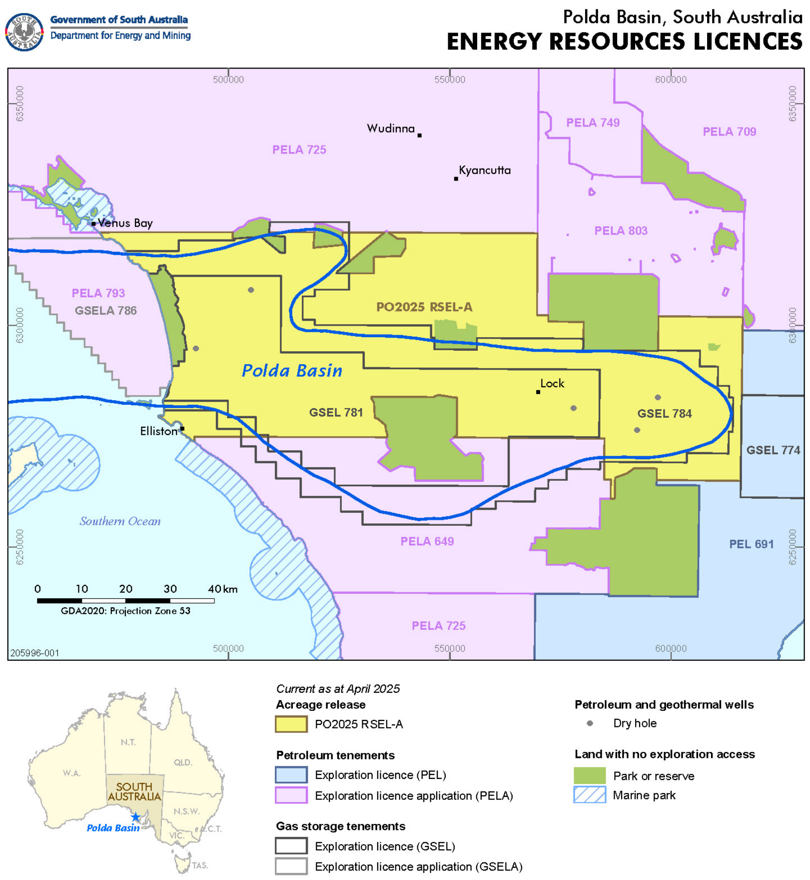
- The SA 2025 bid round closed on 31 October 2025.
- Nine blocks were offered (18,353km^2) wrt exploration, geothermal and gas storage in two basins prospective for gas and natural hydrogen
- This was the first acreage release made by the SA government since 2019
- Evaluation of bids is currently underway………..

Otway Basin



Total Gas expelled from Otway Basin source rocks, bcf/sq km

Polda Basin

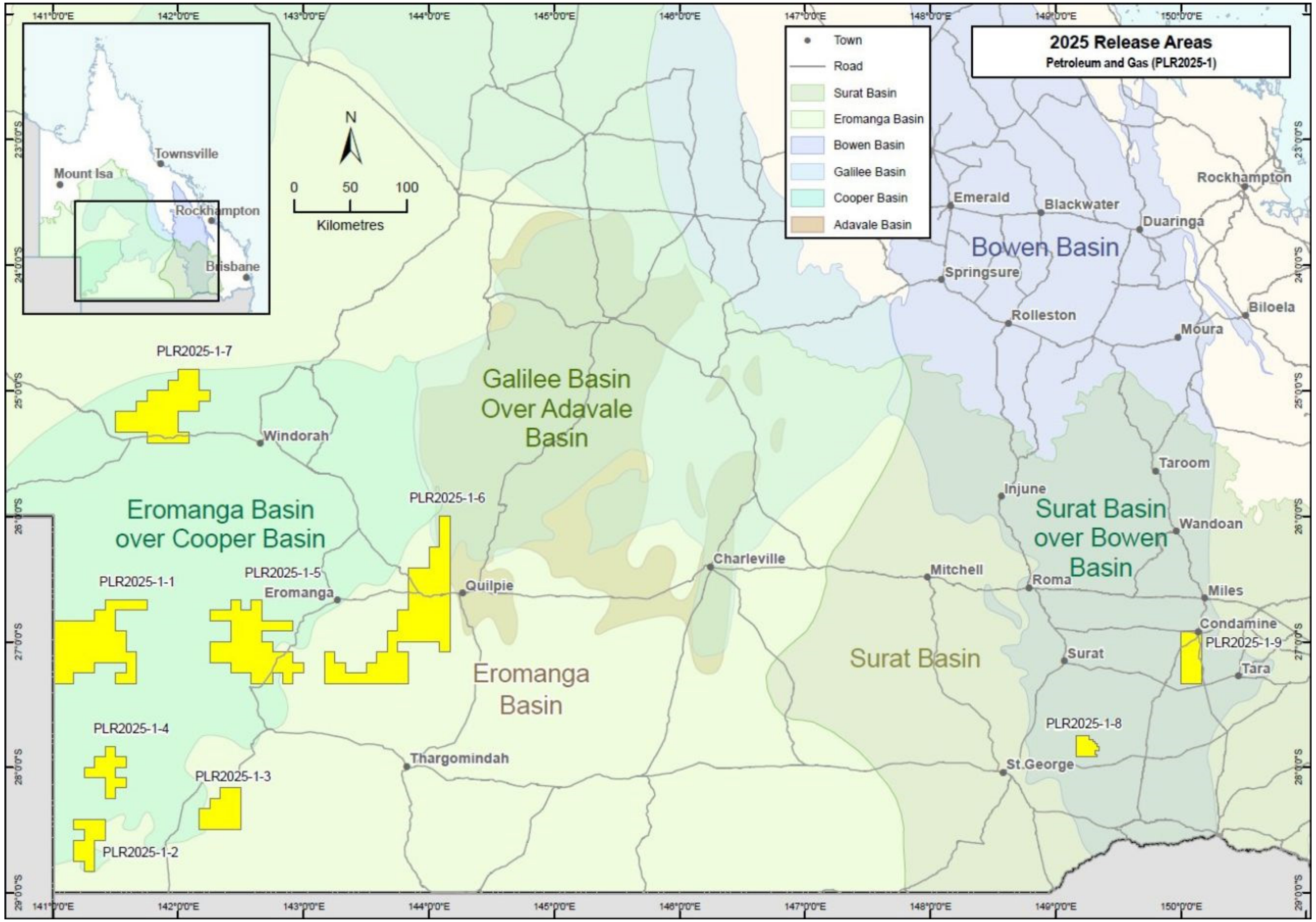


From DEM 2025

Qld 2025 acreage release: Cooper, Bowen/Surat Basins

Announced at the 2025 AEP conference in Brisbane in May

- The Qld 2025 bid round closed on 7 August 2025
- Nine blocks were offered ($16,000km^2$) wrt exploration and gas storage in three prospective basins (Cooper, Surat and Bowen)
- Evaluation of bids is currently underway………..



From the Queensland Government (LinkedIn page) 2025

Filling the gap: what SA is doing……

To help facilitate new gas supplies for SA, DEM has undertaken the following initiatives:

- Acreage Release - At the AEP Conference in May 2025, South Australia announced exciting new areas for exploration with onshore acreage releases in the Otway and Polda basins. The Otway Basin release follows detailed research by DEM to upgrade prospectivity of a proven but under-explored region. **More acreage releases to come…in 2026?**

- In October 2025, the SA Gas Initiative was launched. The $17.5 million initiative is designed to accelerate investment in gas projects through targeted competitive grants for gas supply, storage, pipelines and gas imports.

- A Request for Information (DRI) process was advertised in July 2025, seeking natural gas supply and infrastructure options from industry for the transformation of the Whyalla Steelworks.

Government of South Australia | ENERGY & MINING

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Industry > Energy resources > Industry activity > 2025 SA Gas Initiative Grant Scheme

2025 SA Gas Initiative Grant Scheme

Energy resources
- Investment
- Licensing and land access
- Regulation
- Prospectivity
- Infrastructure and markets
- Data Centre
- Industry activity
  - Annual exploration and

The state government is calling for project proposals for the 2025 SA Gas Initiative.

The South Australian government's **2025 SA Gas Initiative** is a new $17.5 million initiative, designed to accelerate investment in a portfolio of gas projects in South Australia through targeted competitive grants. The portfolio has scope to include projects addressing natural gas supply, storage and infrastructure.

The Minister for Energy and Mining has established a Gas Security Infrastructure Fund (Fund) to deliver the 2025 SA Gas Initiative.

The objectives of the Fund are to support projects, studies and other activities of a public interest nature which enhance energy resources industry projects that will assist with meeting South Australia's mid to long-term energy needs and transition to clean energy to support the achievement of Australia's greenhouse gas emissions reduction targets.

The Australian Energy Market Operator (AEMO) 2025 *Gas Statement of Opportunities* forecast risks of peak day gas shortfall from 2028, and structural supply gaps emerging from 2029 in South Australia. The lead targeted outcome of the **2025 SA Gas Initiative** will be significant projects that can help in meeting gas supply shortfalls predicted to impact South Australia from 2028.

Applications open Thursday 30 October 2025 and close 4:00 pm ACDT, Friday 28 November 2025.

Tender: Gas Supply Solutions for Whyalla Steelworks Transition to Green Steel

Released 5 months ago

Similar Tenders Awarded ~ **$10,000 – $780,000**

About

The South Australian government is seeking proposals to support the transition of the Whyalla Steelworks to green steel production through a new Direct Reduced Iron (DRI) facility. Utilizing the Upper Spencer Gulf's magnetite reserves, the initiative is part of the Green Iron and Steel Strategy aimed at future green iron exports. This Request for Information (RFI) seeks input on the supply and transport of natural gas, an essential component for the steelworks' transformation. Interested parties are encouraged to engage with the steelworks' Administrator and potential new owners to become preferred suppliers or solution providers. Attendance at the industry briefing is limited and available via Microsoft Teams for those registered.

This RFI is suited for energy suppliers with experience in natural gas infrastructure. Potential suppliers must be prepared for a collaborative process with new steelworks ownership and adaptable to evolving technology choices.

Closing

Tender closed on 14 Aug 2025

Location

SA

Agency

Department for Energy and Mining — SA

Category

Manufacturing & Industrial

Filling the gap by LNG importation….. in 2027/28?

- Sales gas need to be liquified refrigerated to -162°C to make LNG
- This requires a significant amount of energy - 22% of Australia's gas (2018) is used to liquefy gas for export
- Importing LNG. The liquid gas must become a gas again. This process uses sea water to heat up the gas

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One of the world's first floating LNG import terminals, powered by 100% renewable energy.

SA importing LNG in 2027?

CURRENT STATUS

After more than 6 years of planning and development; the Outer Harbor LNG Project is now shovel-ready. All regulatory approvals in are in place and Stage 1 Enabling Works were completed in December 2023. The next stage of construction is scheduled for later in 2024.

Project construction will be completed by the end of 2026, followed by the commissioning of the terminal with first gas flowing into the system by mid-2027.

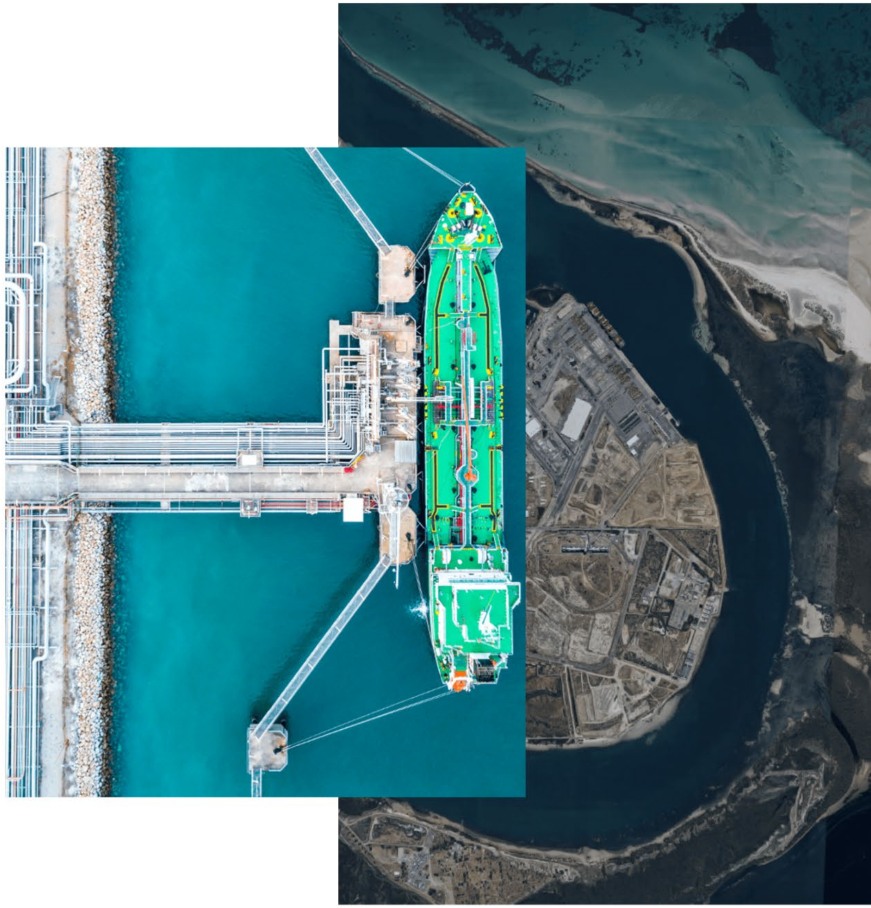
The Project's construction will create more than 350 construction jobs and around 100 new direct and indirect jobs following commissioning.

LOCATION

Outer Harbor, Port Adelaide, South Australia

COMPONENTS

- Infrastructure-based tolling terminal
- 2 new berths
- 146 000m^3 FSRU
- Capable of injecting 386Tj per day throughput
- Gas pipeline connection into the state's gas network



From Venice Energy 2025

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Victoria importing LNG in 2028?

From Viva Energy 2025

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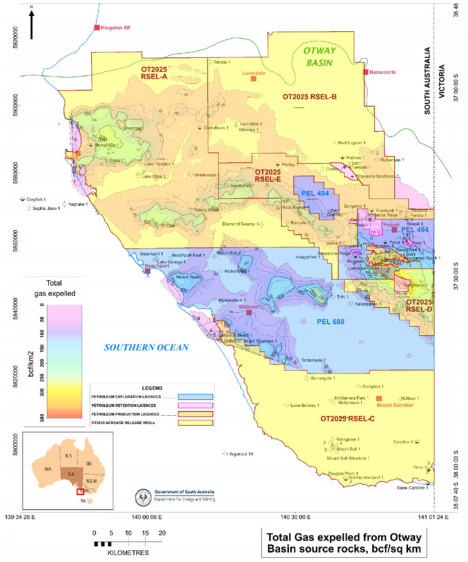
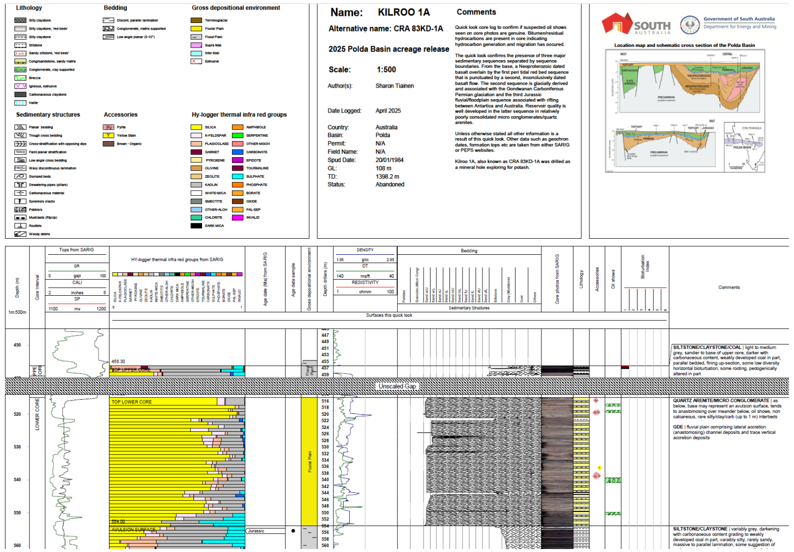
Energy Resources Team: Key 2025 Milestones

1. First successful energy acreage release since 2019 ~AUD$90M of guaranteed work program
2. Opened a potentially new energy basin – Polda Basin (Eyre Pen)
3. De-risked northern Cooper Basin acreage by publishing evidence of a new Triassic source
4. Delivered a new Warburton Basin structure and highlighted overlooked prospectivity

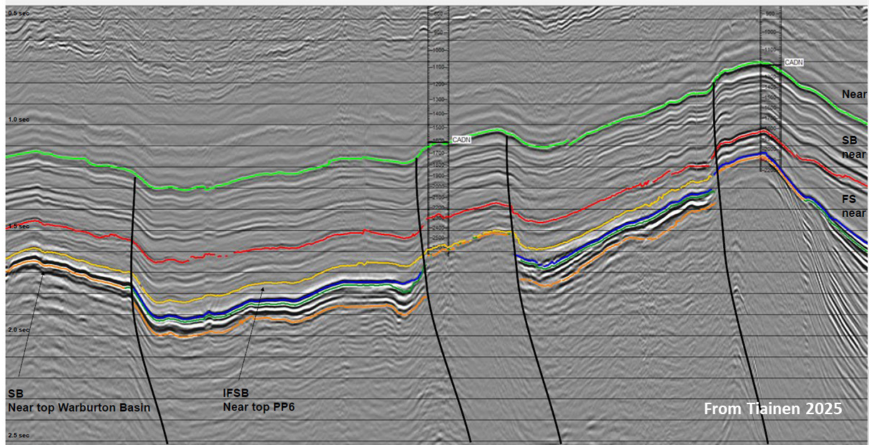
1. Otway & Polda - Acreage Release



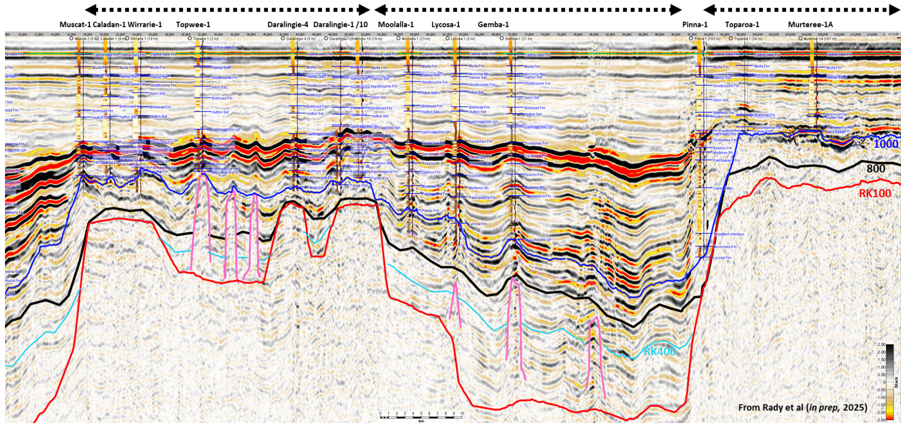
2. Polda Basin – H_2/HC Generation



3. Cooper Basin - Triassic Source Rx



4. Warburton Basin - Prospectivity



Moomba Carbon Capture & Storage (CCS) Update

…….a significant step for SA and Southeastern Australia

- Raw natural gas that comes into the Moomba facility (SA/QLD Cooper basins, Surat/Bowen flow to Moomba) is stripped of its CO_2

- This CO_2 is liquified (using solar and Cooper Basin gas power) and injected into the Toolachee Formation at Strzelecki and Marabooka Fields

- **This means in SA we are using CO_2 free (Cooper) gas!!!!**

From Santos 2025

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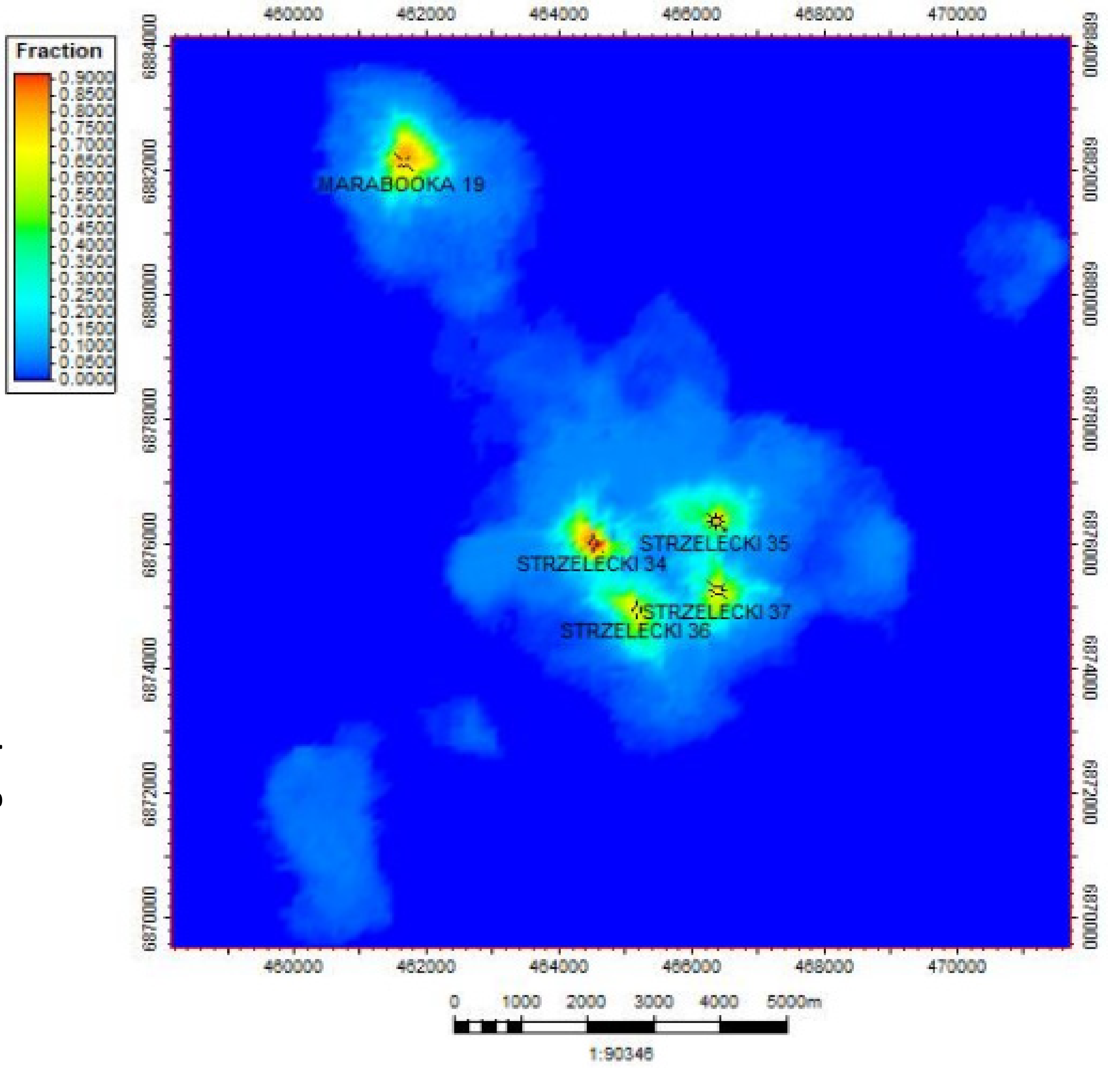
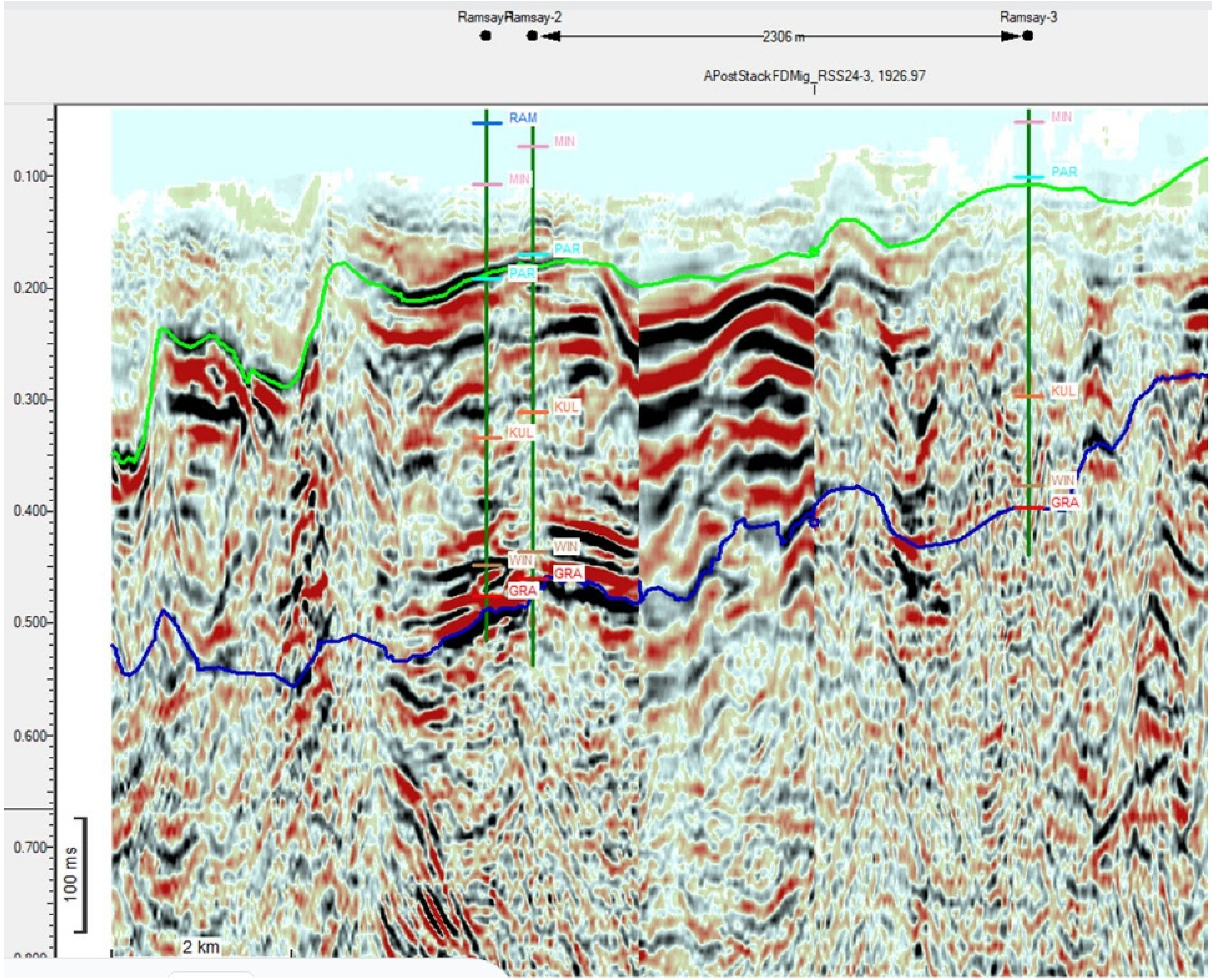


From DEM 2025 – Santos July Moomba CCS Monitoring Report

Natural hydrogen (and helium) exploration in SA: Q4, 2025 update

Ramsay 3 well site: From Small Caps 2025

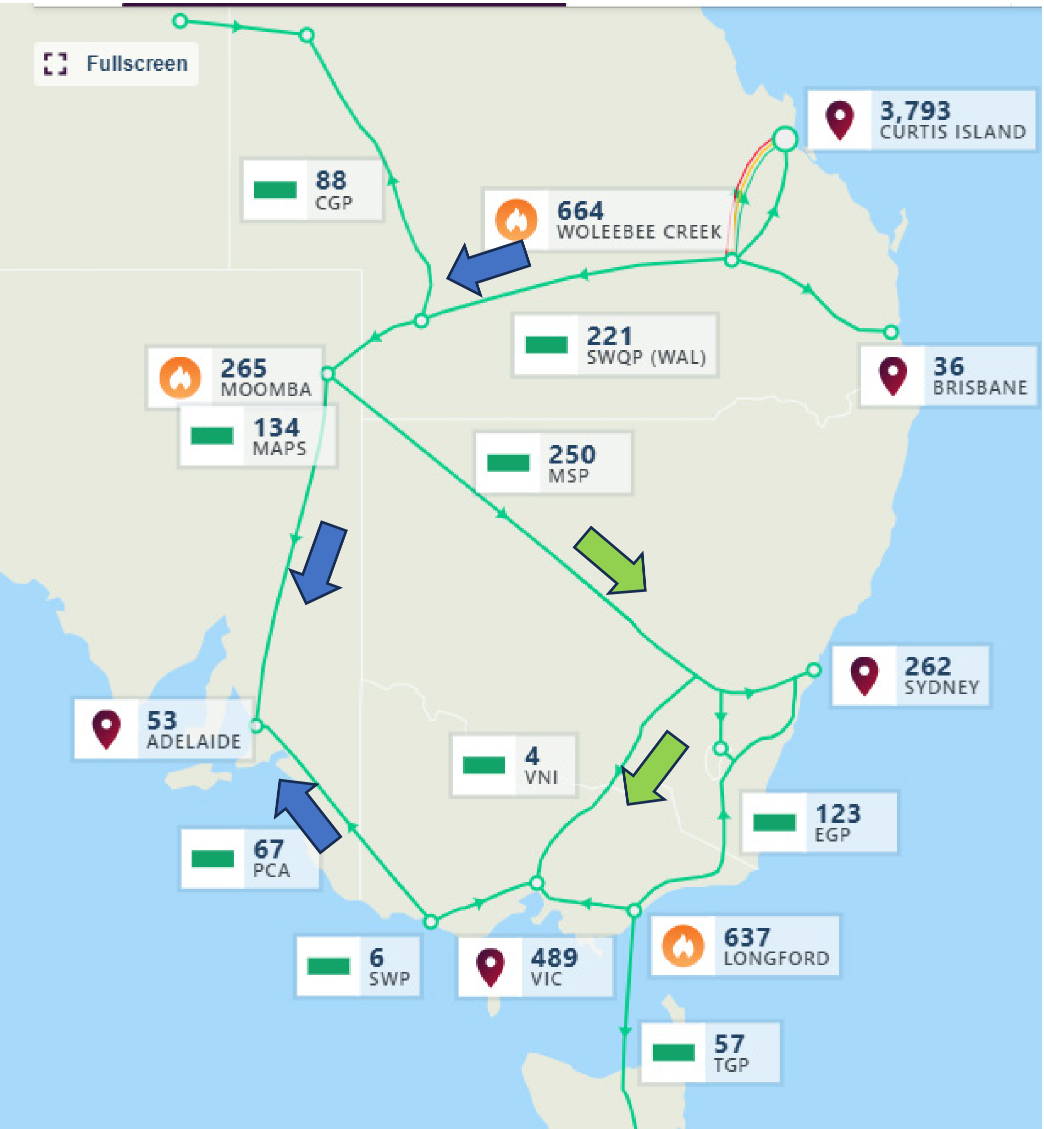
- **Ramsay 3** encountered several zones of H_2/He in the Parara Limestone and Kulpara Dolomite formation. ~2.3km from Ramsay 2
- **Ramsay 4** well site is currently being prepared for spud



From Gold Hydrogen 2025

Summary

- Australia is a global strategic gas supplier and is critical to industrial economies in SE Asia
- Australia and South Australia exports 75% of sales gas produced
- South Australia is a critical player in the East Coast gas market both as a producer of gas, a gas distribution hub and wrt CO_2 capture/storage
- Gas is a vital firming fuel for SA. Gas keeps the lights on at night
- There is a looming (2028) gas supply gap in SE Australia coinciding with an expected dramatic increase in Australian AI/ML demand
- DEM is in the process of reviving gas exploration activity:
    - Exploration re-start. SA's 2025 acreage release with AUD$90M of guaranteed work program … and hopefully new gas!
    - DEM's 2025 $17.5M gas initiative…. new gas before 2028….
    - Warburton Basin prospectivity project delivered to industry
    - Possibly awakened a new SA energy province: the Polda Basin
    - Announced to industry a new Cooper Basin Triassic source rock – extending prospectivity northwards



Source: AEMO GBB Interactive Map – 14th August 2025

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