EnergyEdge

Gas in Australia: Saviour or Villain?

AUSTRALIAN DOMESTIC GAS OUTLOOK 2025

April 2025

Gas in Australia… Saviour or Villain?

Simple Question

- A simple question with a complex answer
- Let's focus on the east coast.
- What are the complexities?

Saviour Aspects

- There is a strong role for natural gas during each stage of the transition to low-carbon future
- Discretionary electricity supply (entry and exit)
- High penetration during high demand, low renewables conditions

Villain Aspects

- **Southern Gas Market Supply Problem**
- Victoria has a strong gas heating consumption in both capacity and energy
- International price linkages

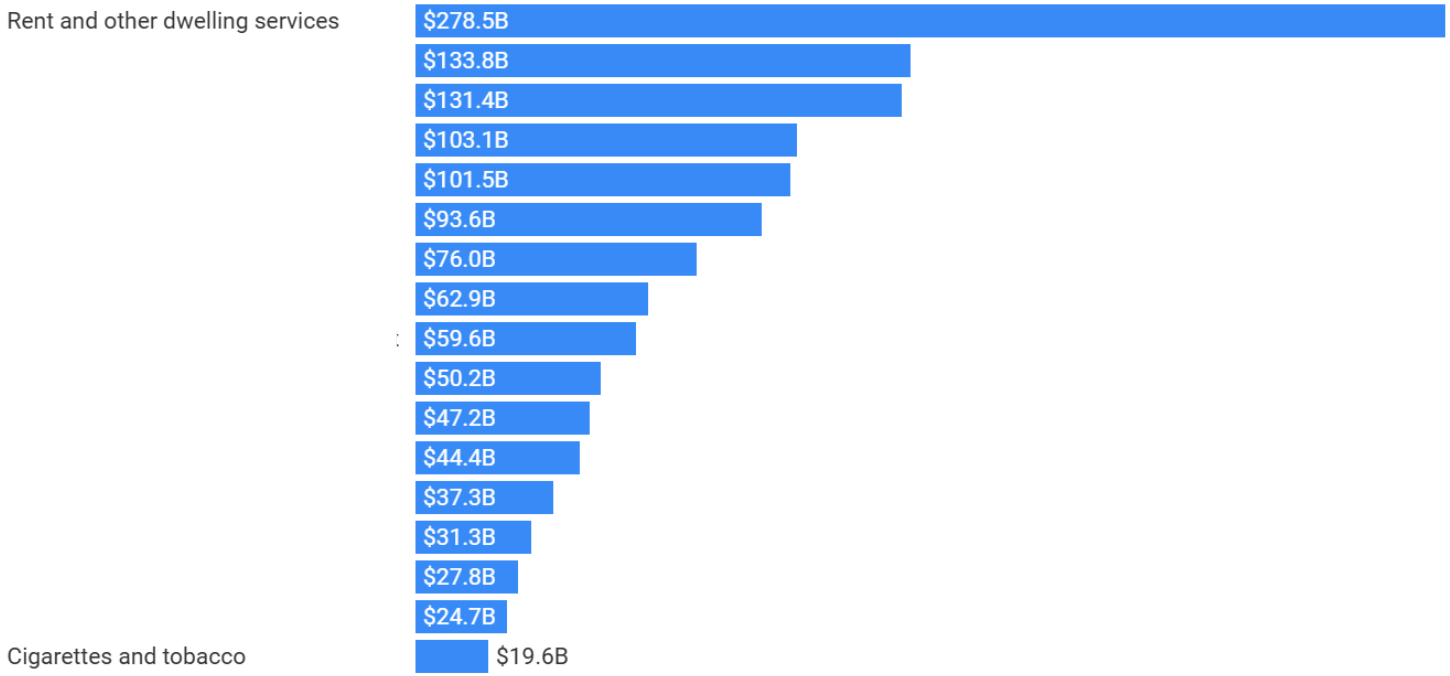
Let’s start with a quiz

- 2023
  - High retail prices have been passed to domestic consumers
- Where does energy costs (electricity plus gas)
  - But does exclude petrol costs

How much do Australian households spend in 2023?

According to ABS data, Australian households spent a total of $1.3 trillion on general living costs in 2023. That is close to $100 billion more than 2022.

Australian household expenditure in 2023



Embed this chart on your site.

Chart: Finder • Source: ABS, Finder

Finder

Let’s start with a quiz

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  - High retail prices have been passed to domestic consumers
- Where does energy costs (electricity plus gas)
  - But does exclude petrol costs
- Betting losses is estimated at $31.5B

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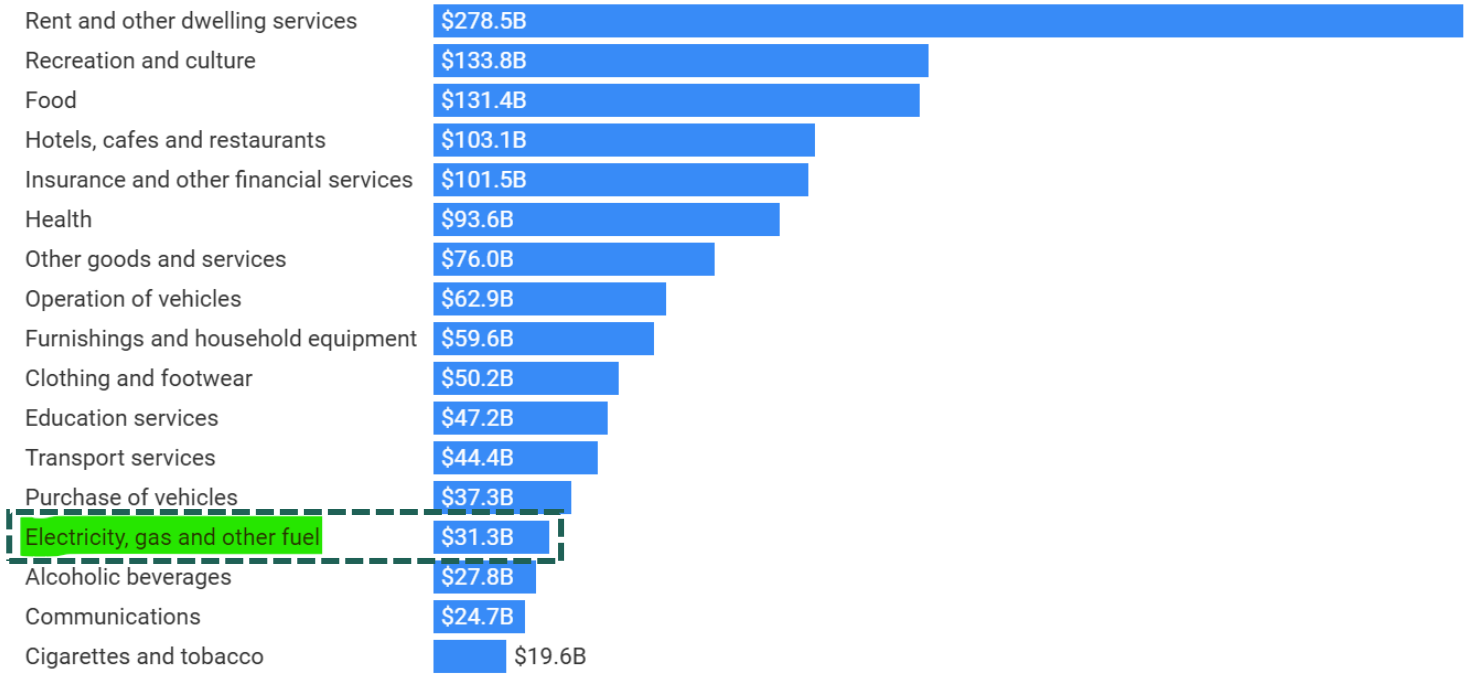

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Chart: Finder • Source: ABS, Finder

Finder

What is gas used for?

LNG Exports

- Largest and most politically sensitive consumer of gas
- Economics driven by international supply and demand dynamics of the LNG market
- Logic:
  - Buy low domestic gas
  - Liquify
  - Sell to high international gas market
- All year baseload

Residential and Commercial Heating

- Weather dependent gas consumption to provide spatial heating
- Impacts winter capacity requirements
- Tried and true method of “Light it on fire”
- Logic:
  - Buy low gas market
  - Convert to heat based on temperature
- Winter capacity

Residential Cooking and other needs

- Non-weather dependent gas consumption.
- Impacts annual energy requirements
- Logic:
  - Buy low gas market
  - Use in flat load
- All year baseload

What is gas used for?

Manufacturing Feedstock

- Chemical manufacturers which require a chemical reaction with methane
  - E.g. Orica, Incitec
- Chemical replacement is difficult
- Logic:
  - Buy low gas market
  - Convert to high heat
  - Sell into high international market
- All year baseload

High temperature industry

- Heavy industry and building materials manufacturing that require high temperatures
  - E.g. Brickworks
- Replacement with electricity is difficult to achieve temperature requirements
- Logic:
  - Buy low gas market
  - Convert to high heat
  - Sell high domestic market
- All year baseload

Gas powered electricity generation

- Utilising gas generation to meet peak demand conditions (OCGT) or underlying energy (CCGT)
- Logic:
  - Buy low gas market
  - Convert to electricity
  - Sell high electricity market
- Summer and Winter Capacity

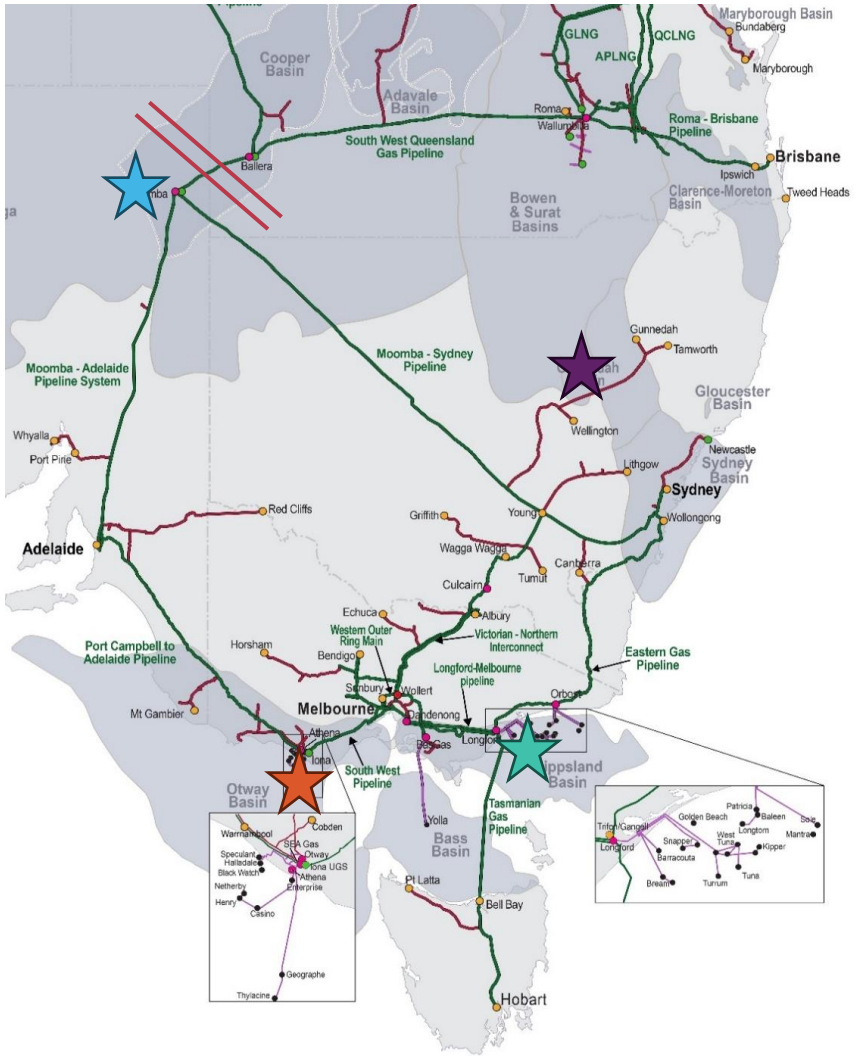
What is the Southern Gas Market Supply Problem?

Defining the problem(s)

Southern Gas Market?

Gas Production Assets

- Longford Gas Plant (Gippsland)
  - **2022: 68.7% (835 TJ/d) ← Dominant Source**
  - 2023: 60.4% (584 TJ/d)
  - 2024: 53.3% (523 TJ/d)
- Moomba Gas Plant (Cooper Basin)
  - 2022: 18.1% (220 TJ/d)
  - 2023: 25.3% (244 TJ/d)
  - 2024: 25.6% (251 TJ/d)
- Otway Gas Plant (Otway Basin)
  - 2022: 8.3% (101 TJ/d)
  - 2023: 8.4% (81 TJ/d)
  - 2024: 13.1% (129 TJ/d)

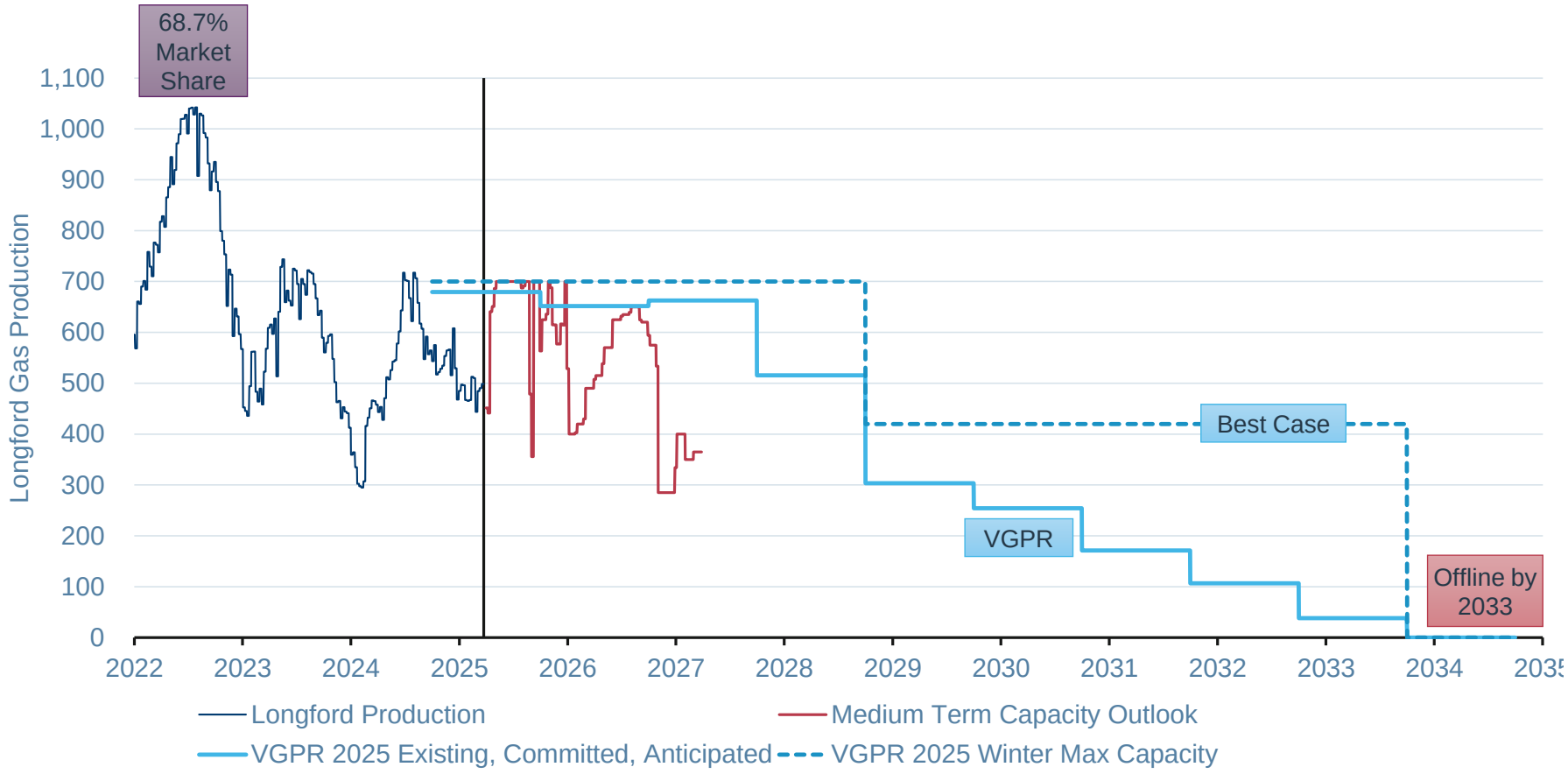


… gas demand & supply but south of Qld border

Source: AEMO GSOO 2025, Gas BB, Energy Edge

GSOO 2025: Longford

- Longford has commenced decline.
  - 2024: Gas Plant 1 offline
  - **2029**: Gas Plant 3 offline
  - **2033: Gas Plant 2 offline**
- 2022
  - 83.9% Victorian Supply Market Share
  - **68.7% Southern Gas Supply Market Share**
- Market Share Decline
  - Kodak
  - Internet Explorer
  - Blackberry
  - Horse and Cart!



Longford Gas Plant – Actual, Medium Term Capacity Outlook, GSOO/VGPR

Source: AEMO GSOO 2025, Gas BB via Energy Edge

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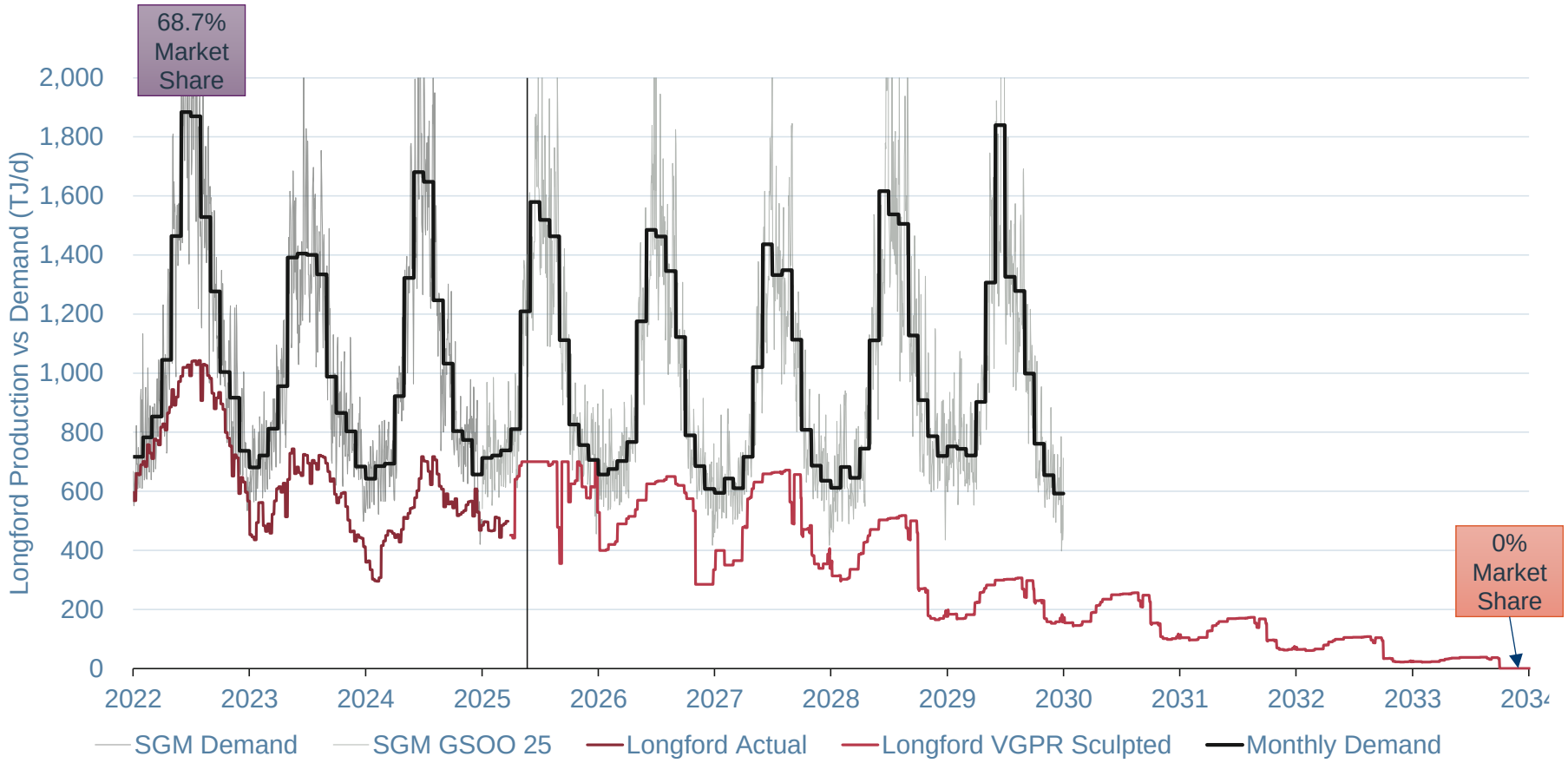
  - **2029**: Gas Plant 3 offline
  - **2033: Gas Plant 2 offline**
- 2022
  - 83.9% Victorian Supply Market Share
  - **68.7% Southern Gas Supply Market Share**
- **2022 to 2033 Market Share Decline to 0%**
  - Kodak
  - Internet Explorer
  - Blackberry
  - Horse and Cart!



Longford Gas Plant – Actual, Medium Term Capacity Outlook, GSOO/VGPR

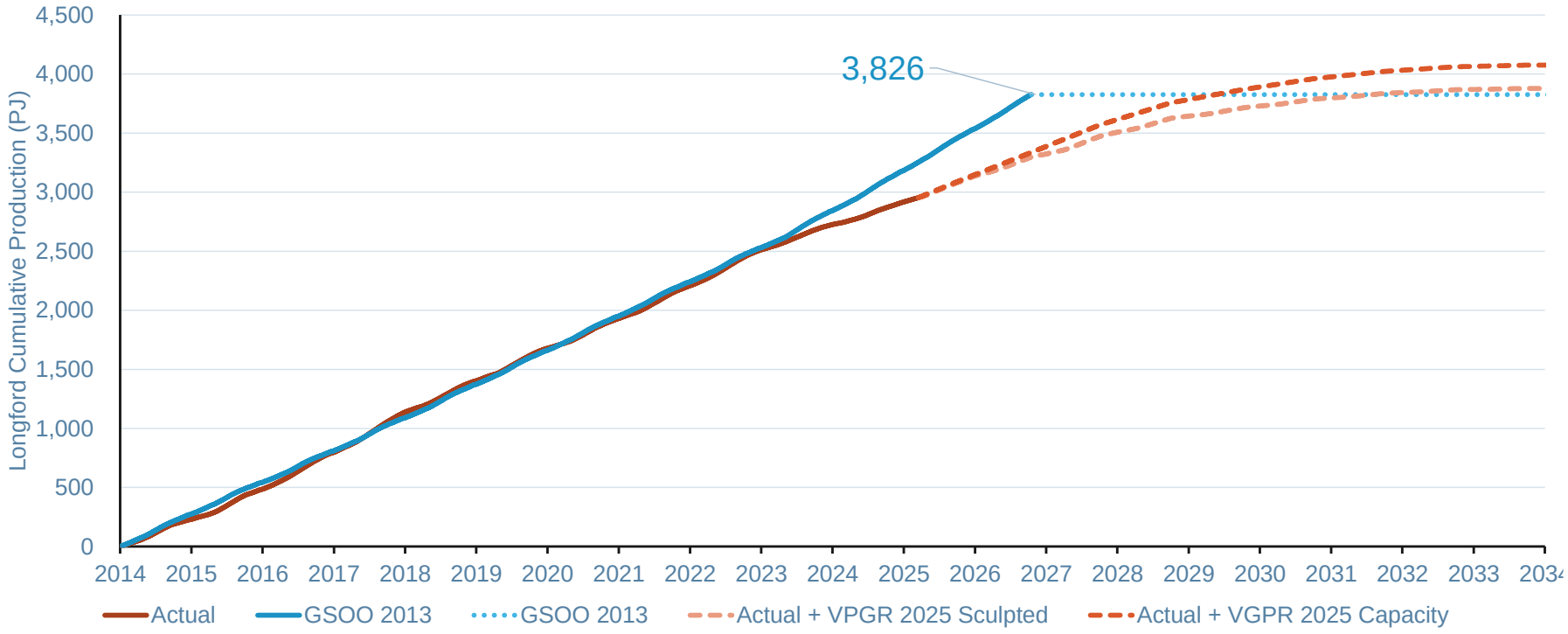
Source: AEMO GSOO 2025, Gas BB via Energy Edge

Longford: What did we know? And when did we know it?

Longford Analysis

- GSOO 2013
  - GSOO 2013 Reserve Utilisation: **3,826PJ**
- GSOO 2025
  - Actual + GSOO Sculpted 2025 Capacity: **3,878PJ** (~1.3% error)
  - April 2025 2,954PJ of 3,878PJ reserves consumed (77% finished)

- End of 2022: ~0.7% error
- End of 2034: 1.3-6.7% error



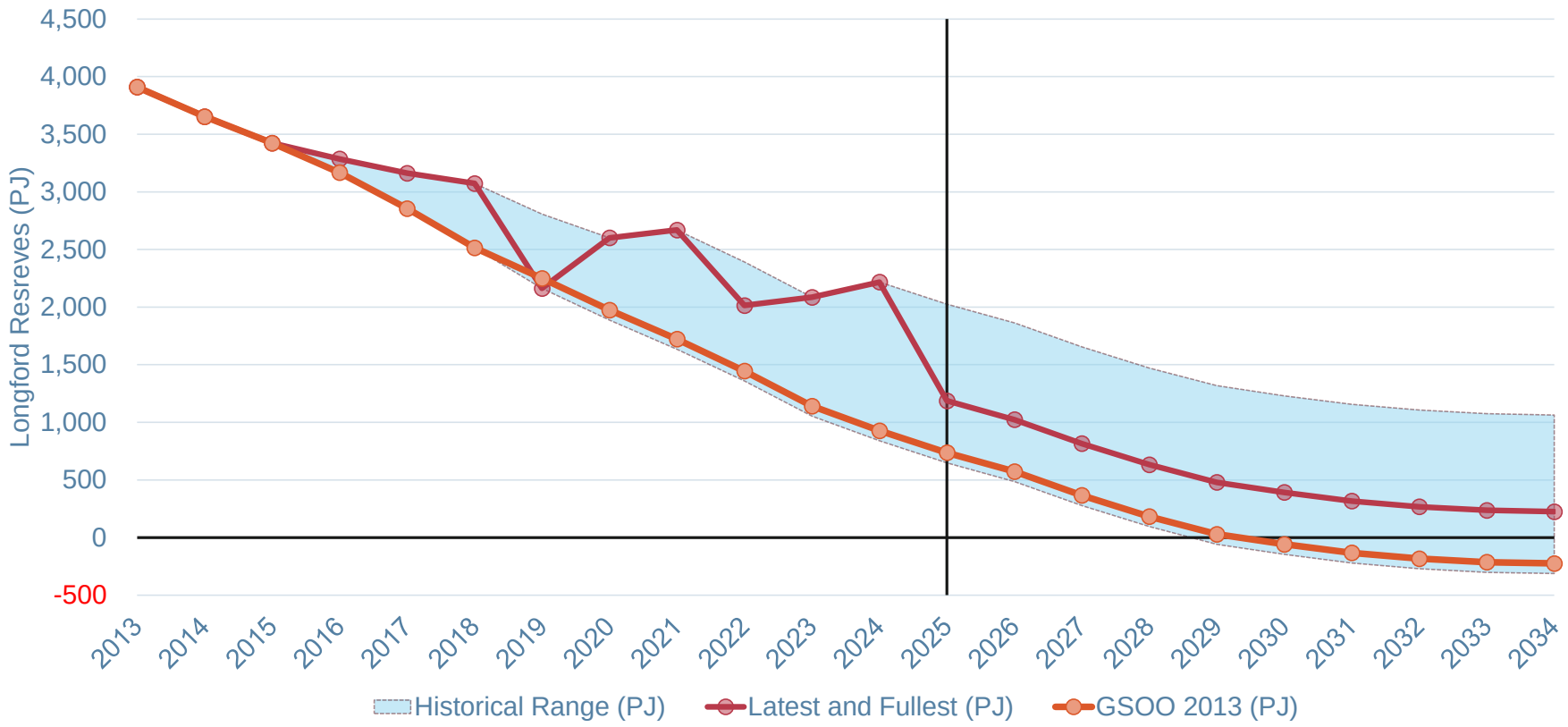
Longford GSOO 2013 vs Actual Production + VGPR2025 Sculpted

Source: AEMO GSOO 2013, VPGR 2025, Gas BB via Energy Edge

Longford: What did we know? And when did we know it?

Longford Analysis

- Each GSOO Updates the Gippsland Basin Reserves
- Extrapolation of the GSOO 2013 reserves are relatively close to the GSOO 2025 reserves
- Most recent reserves show that the Gippsland Basin is approaching terminal decline by 2034



Longford GSOO 2013 vs Actual Production + VGPR2025 Sculpted

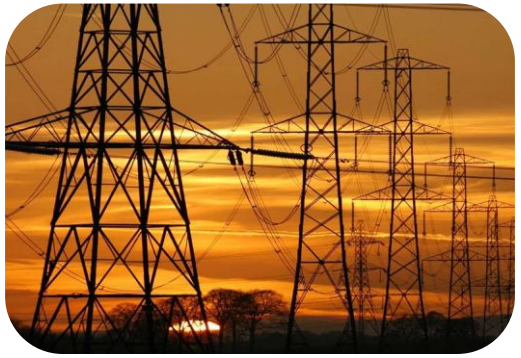
Source: AEMO GSOO 2013, VPGR 2025, Gas BB via Energy Edge

Solutions to investigate

#1 Add more SGM supply

#2 Deliver gas from Qld

#3 Add LNG Imports



#4 Change Demand

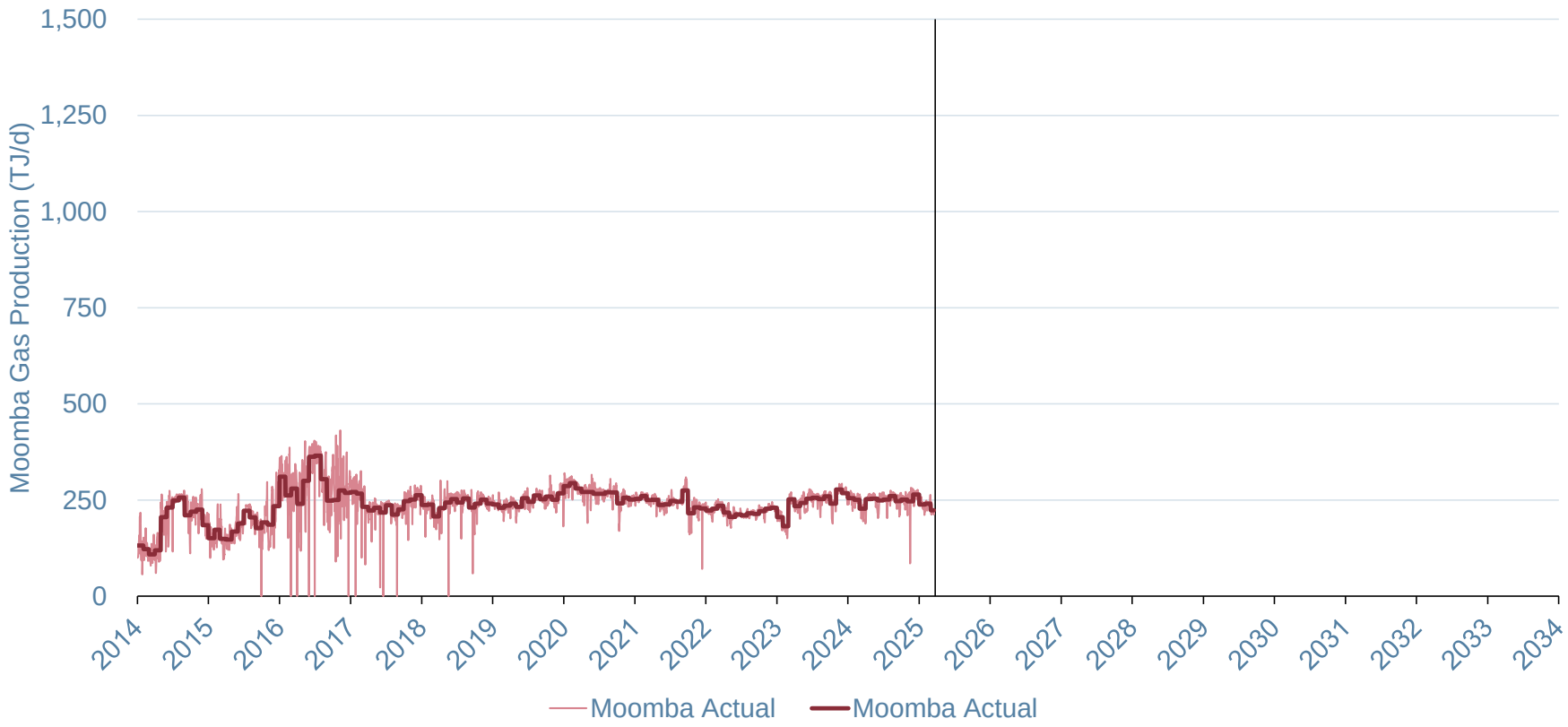
Potential Solution #1

Add more supply. Arrest decline.

Moomba: What do we know? And when did we know it?

Moomba Analysis

- Cal 2024
  - Actual: 250TJ/d
- 2014-2025
  - Actual: 955PJ



Moomba Supply

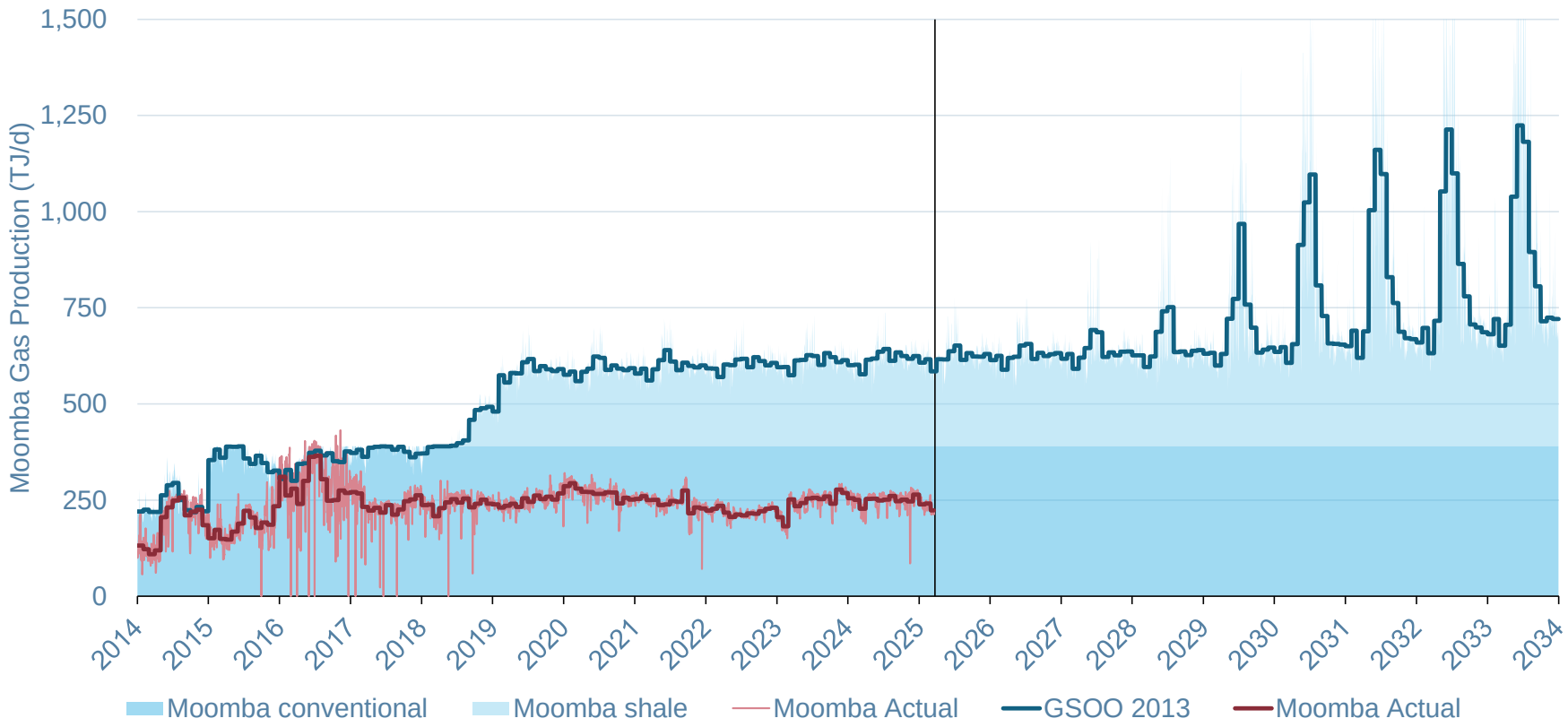
Actuals

Source: AEMO GSOO 2025, Gas BB via Energy Edge

Moomba: What do we know? And when did we know it?

Moomba Analysis

- GSOO 2013
  - Projection of high exploitation of gas reserves from 2019
    - GLNG train 2 step up
  - Additional winter-only step up from 2029
    - Large Coal Exit
- Cal 2024
  - Actual: 250TJ/d
  - GSOO13: 621TJ/d
- 2014-2025
  - Actual: 955PJ
  - GSOO13: 1,953PJ



GSOO 2013 Moomba Supply Projections vs Actuals

Source: AEMO GSOO 2025, Gas BB via Energy Edge

Moomba: What do we know? And when did we know it?

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- GSOO 2013
  - Projection of high exploitation of gas reserves from 2019
    - GLNG train 2 step up
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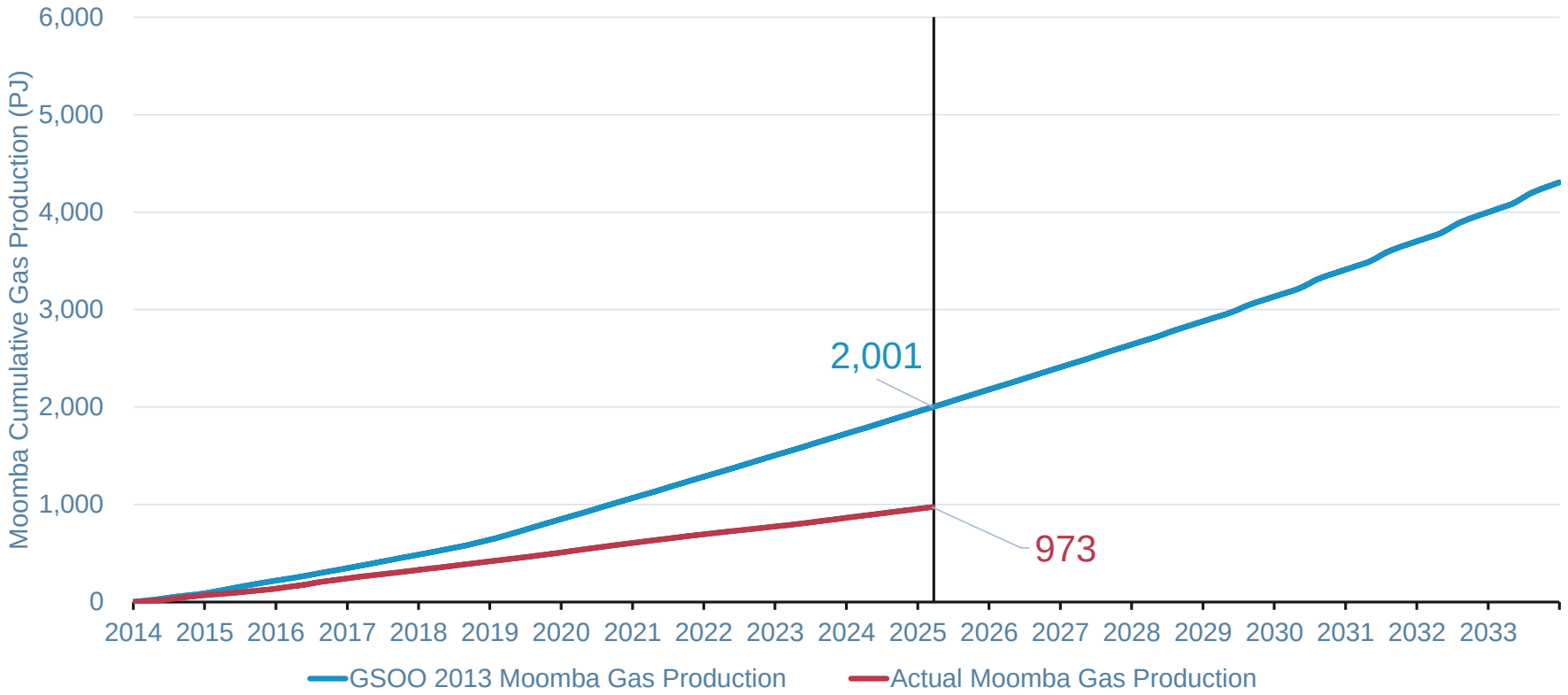
    - Large Coal Exit
- Cal 2024
  - Actual: 250TJ/d
  - GSOO13: 621TJ/d
- 2014-2025
  - Actual: 973PJ
  - GSOO13: 2,001PJ



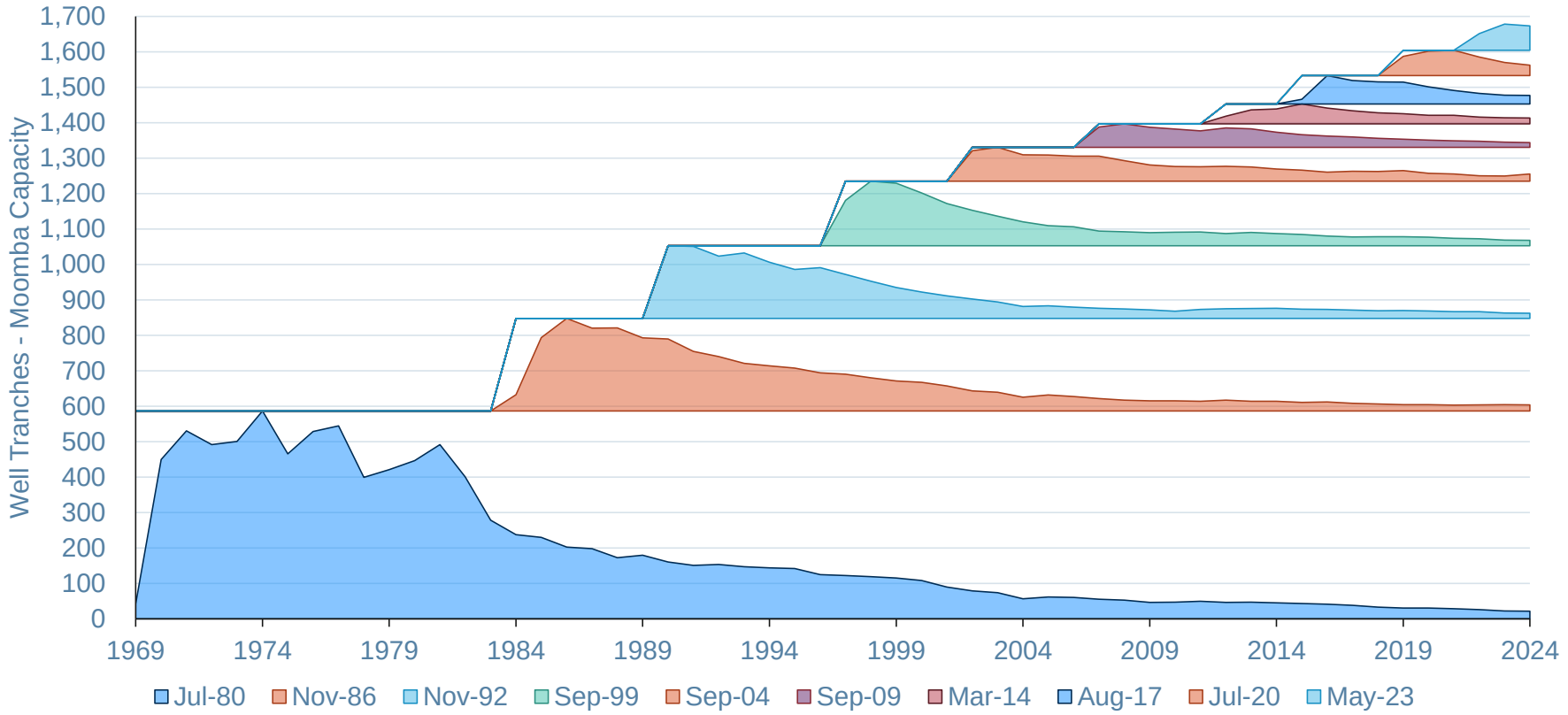
GSOO 2013 Moomba Supply Projections vs Actuals

Source: AEMO GSOO 2025, Gas BB via Energy Edge

Moomba: What do we know? And when did we know it?

Moomba Analysis

- Lack of Drilling?
  - No.
  - 2214 wells drilled since 1969 (Moomba commencement)
  - 952 wells since 2011 (GLNG FID)
  - 1524 wells have been gas production wells
  - 810 wells currently in production



Gas production by Well Tranche (groups of 220 wells) ranked by drill date

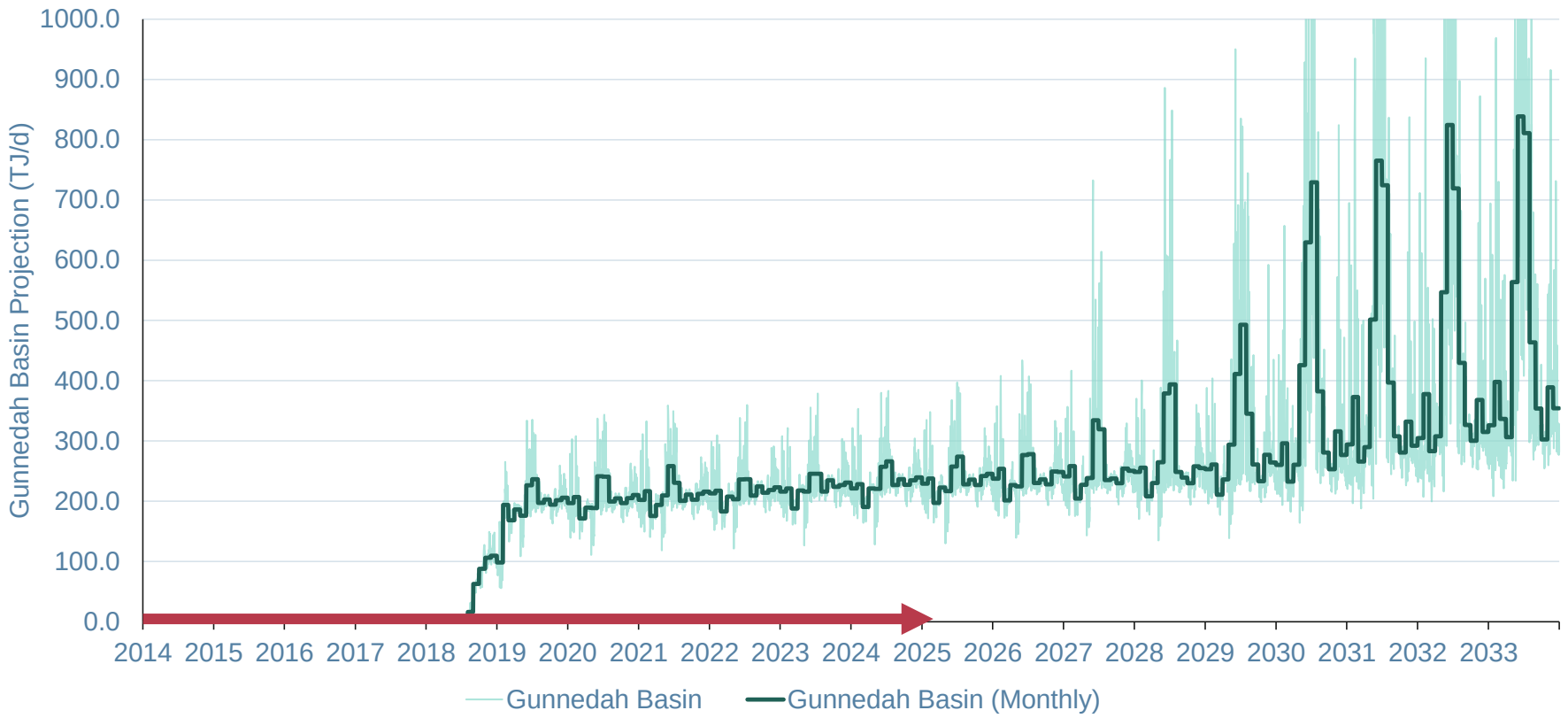
Source: PEPS via Energy Edge

Narrabri: What do we know? And when did we know it?

Narrabri Analysis

- GSOO 2013
  - Projection of high exploitation of gas reserves from 2019
    - GLNG train 2 step up
- Cal 2024
  - **Actual: 0TJ/d**
  - GSOO13: 230TJ/d
- 2014-2025
  - **Actual: 0PJ**
  - GSOO13: 495PJ

- **No gas flows**



GSOO 2013 Narrabri / Gunnedah Basin Supply Projections vs Missing Actuals

Source: AEMO GSOO 2025, Gas BB via Energy Edge

Defining the Southern Gas Market Problem

Longford Decline

- Longford Gas Plant will cease production in 2034
- Market Share Decline
  - 2022: 68.4%
  - 2034: 0.0%
- As projected:
  - Longford followed GSOO 2013 reserve exploitation within 1% error until end of 2022
  - Exploitation of reserves by 2034 is projected to align closely (<6% error) to 2013 reserves

Moomba Stagnation

- Moomba Gas Plant has extracted less than 50% of the reserves anticipated in 2013
- Moomba has produced at annual rate of 244TJ/d ±25TJ/d (±10%) since 2017
- Moomba is producing substantially below 2013 projection
  - 50% of cumulative total
  - 40% of 2025 projected rate

No Narrabri Development

- By 2025, Narrabri / Gunnedah Basin was projected to:
  - be supplying 230TJ/d
  - have extracted 495PJ
- But no gas is flowing

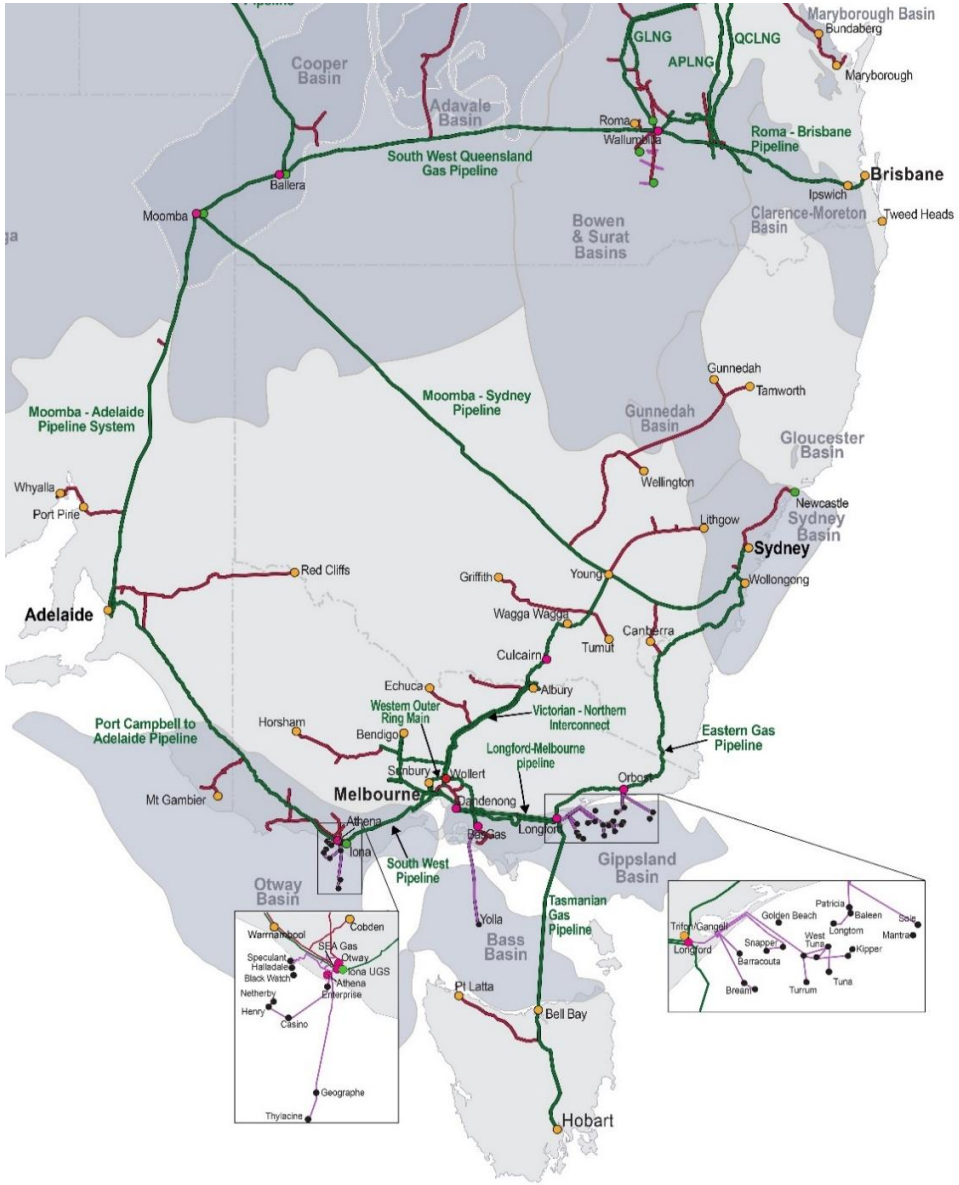
Potential Solution #2

Interregional gas supply / pipelines

Pipeline Gas Flows

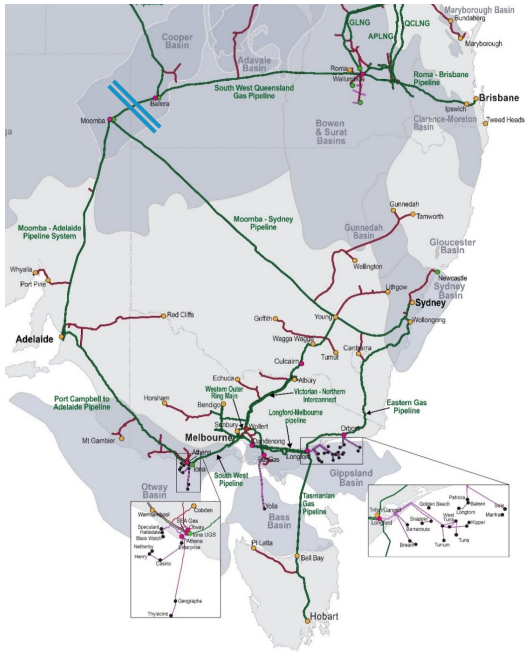
- Cautious and Specific
- Expanding pipelines is like removing traffic constraints – traffic issues just move down the road

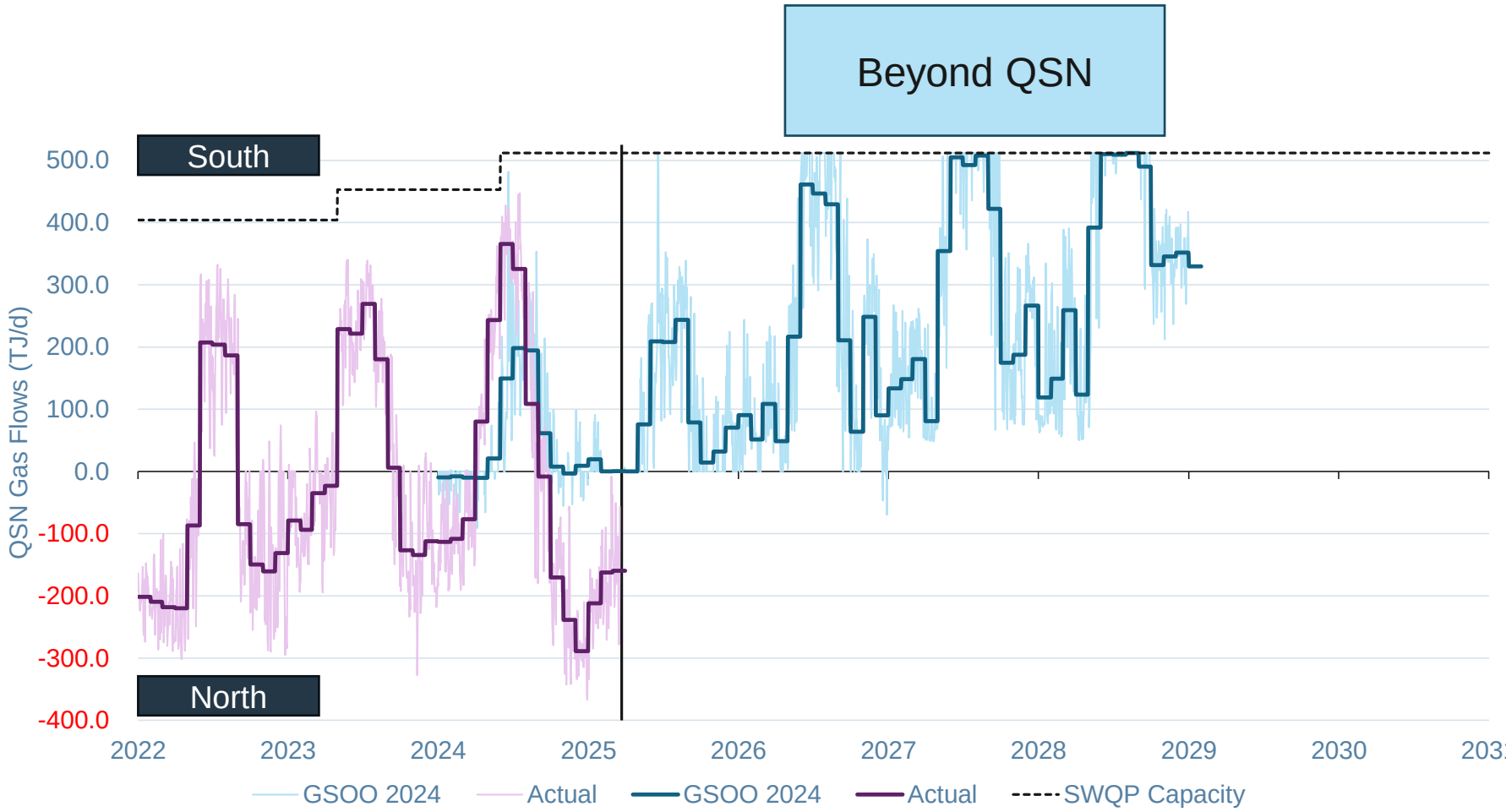
- Target Pipelines
  - South West Queensland Pipeline
  - Moomba to Sydney
  - Victoria New South Wales Interconnector
- Gas Supplies



GSOO24: QSN Flows

- QSN Link (between Ballera and Moomba)
  - Wallumbilla to Melbourne is 2,500km



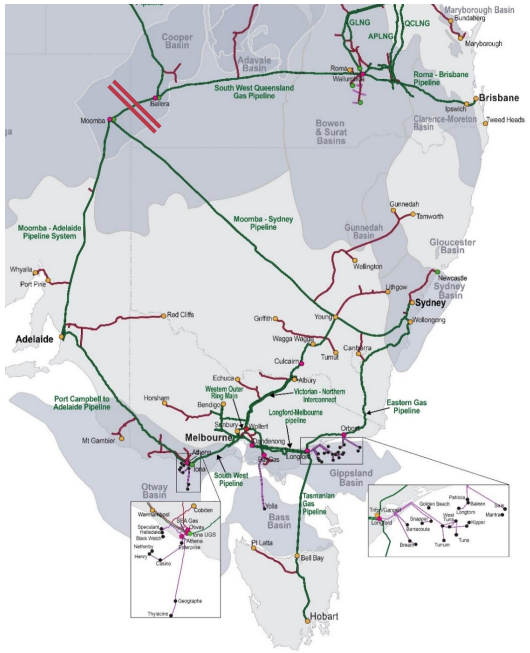


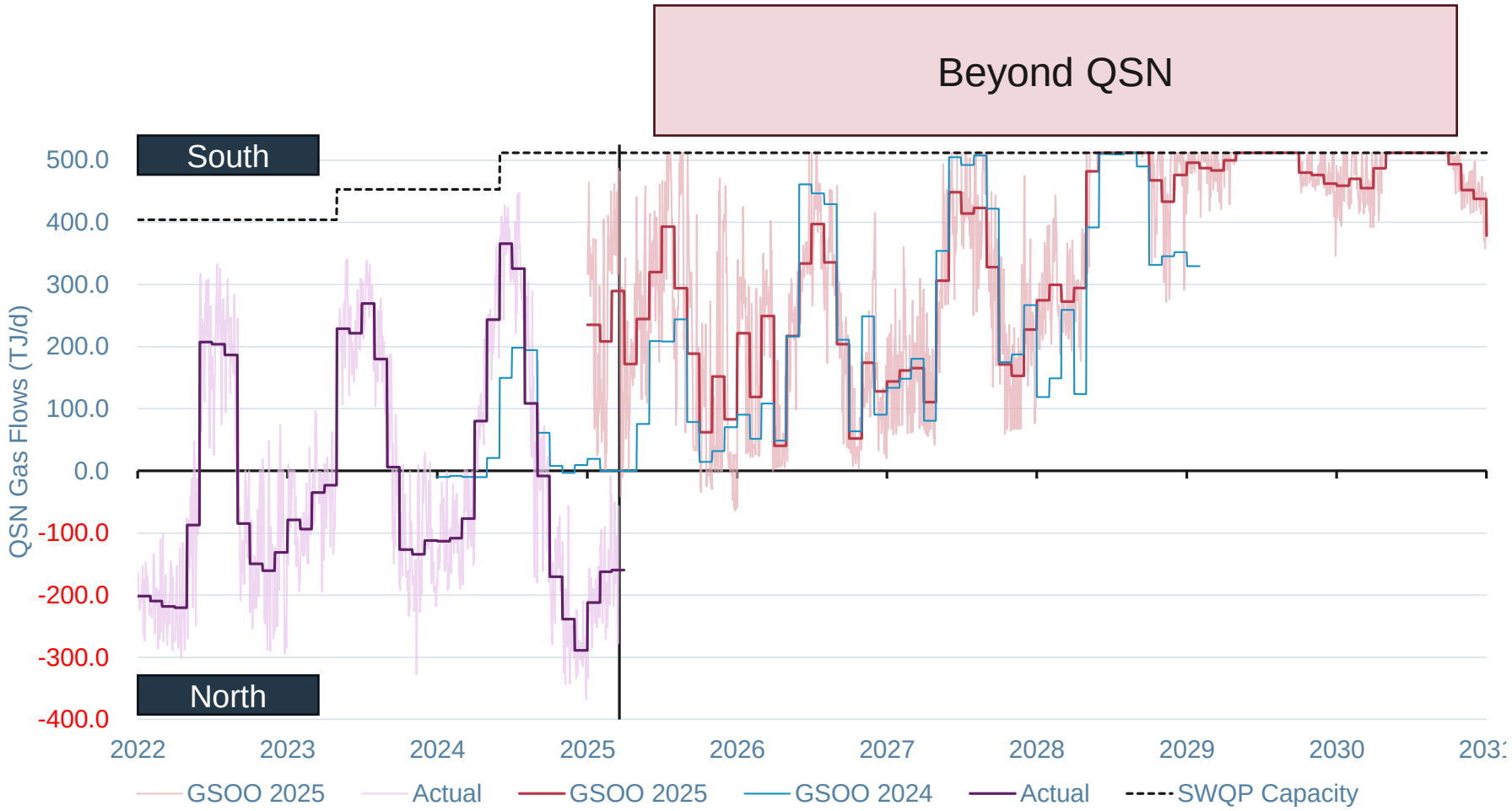
QSN Interconnector Flows – Historical vs GSOO 2024 Projection

Source: AEMO GSOO 2024, Gas BB, Energy Edge

GSOO25: QSN Flows

- QSN Link (between Ballera and Moomba)
  - Wallumbilla to Melbourne is 2,500km





QSN Interconnector Flows – Historical vs GSOO 2025 Projection

Source: AEMO GSOO 2024+25, Gas BB, Energy Edge

APA Upgrades to Grid

1. MSP Ethane Pipeline
   - Additional Winter capacity of 20-25TJ/d
2. MSP Off Peak
   - 80-120TJ/d in summer only
3. Bulloo Interlink
   - SWQP: +93TJ/d
   - MSP: +100TJ/d
   - VNI: +39TJ/d
4. Riverina / Culcairn
   - 500TJ of storage
   - VNI: 350TJ/d

Five-year East Coast Gas Grid expansion plan to ensure lower cost and lower emission domestic gas can be transported to meet East Coast demand*

	Near-term projects New north to south capacity in 2025 and 2026		Medium-term projects Requiring customer commitment and subject to APA Final Investment Decision		
	Moomba to Sydney Ethane Pipeline (MSEP) conversion	Moomba Sydney Pipeline (MSP) off-peak capacity expansion	Stage 3 - Bulloo Interlink Pipeline + new compression	Stage 4 - Riverina Storage Pipeline	Stage 5 - Riverina-Culcairn Connection
Project overview	• Converting MSEP from ethane to natural gas transport • Additional ~20 TJ/day to Victoria or ~25 TJ/day to Sydney	• Delivery of two pressure regulation skids • Additional 80–120 TJ/day of MSP summer capacity	• New 380 km pipeline connecting SWQP to MSP and two new compressors on MSP • Progressively increase MSP capacity from 590 TJ/day to 700 TJ/day and SWQP from 512 TJ/day to 605 TJ/day	• New 148 km storage pipeline, with new compression and pipeline infrastructure • Creating up to 500 TJ of storage which could be delivered in stages to support peak GPG demand	• New compression, looping, and metering and pressure regulating station on the MSP • Up to 350 TJ/day of gas from NSW into VTS
Capex	**~$25m committed capex** Funded by APA existing balance sheet	**~$15m committed capex** Funded by APA existing balance sheet	**~$35m committed capex to fund early works** Total cost and funding arrangements to be disclosed upon FID[28]		
Timing	• Work commenced, targeting completion in 2025	• Work commenced, targeting new capacity to come online in summer 2025 and 2026	• FID target FY26 • Early works commenced, aiming to progressively add new capacity from winter 2026, 2027, 2028	• FID target FY26 • Early works commenced, aiming for new transport and storage capacity to be added in winter 2028 and 2029	• FID target FY28 • New capacity targeted for delivery in winter 2029
Customer Contracting	• Expected to be fully contracted for winter 2026	• Expected to be fully contracted (FY27)	Investment will require early support from customers, with customer engagement underway, and any applicable regulatory approvals		

*For details about APA's East Coast Grid expansion plan, refer to the ASX release dated 24 February 2025.

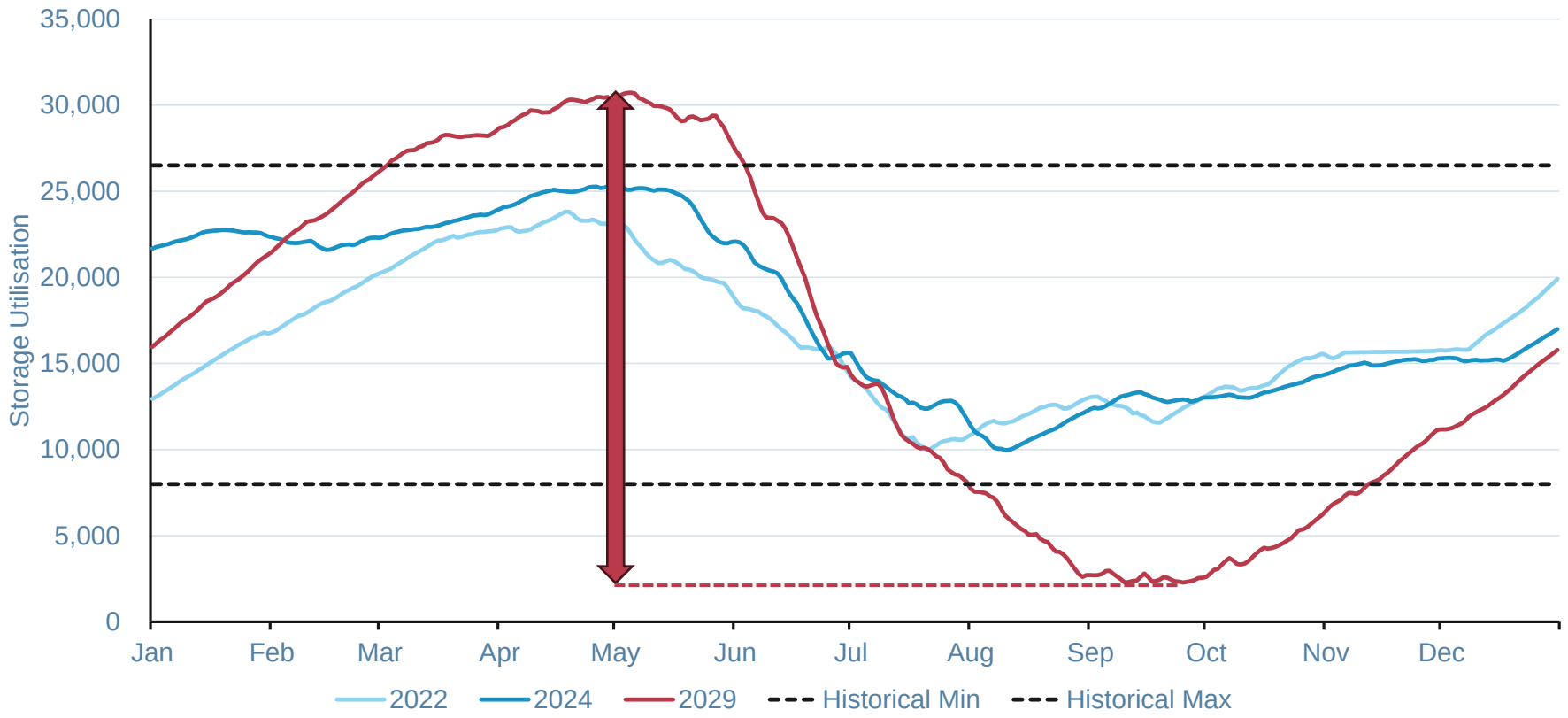
APA 1H25 Results Investor Presentation 27

1H25 APA Results Investor Presentation

Source: APA 1H25 Investor Presentation

Additional storage will be needed

- Shifting winter capacity gas into flat gas
- Actually adding summer gas supplies
- Increasing Summer gas supplies will require winter capacity (i.e. gas storage capacity).



Iona Utilisation (historical) and 2029

Source: GSOO 2025 via Energy Edge

Potential Solution #3

LNG Imports

LNG Imports

The complexity of the LNG Imports

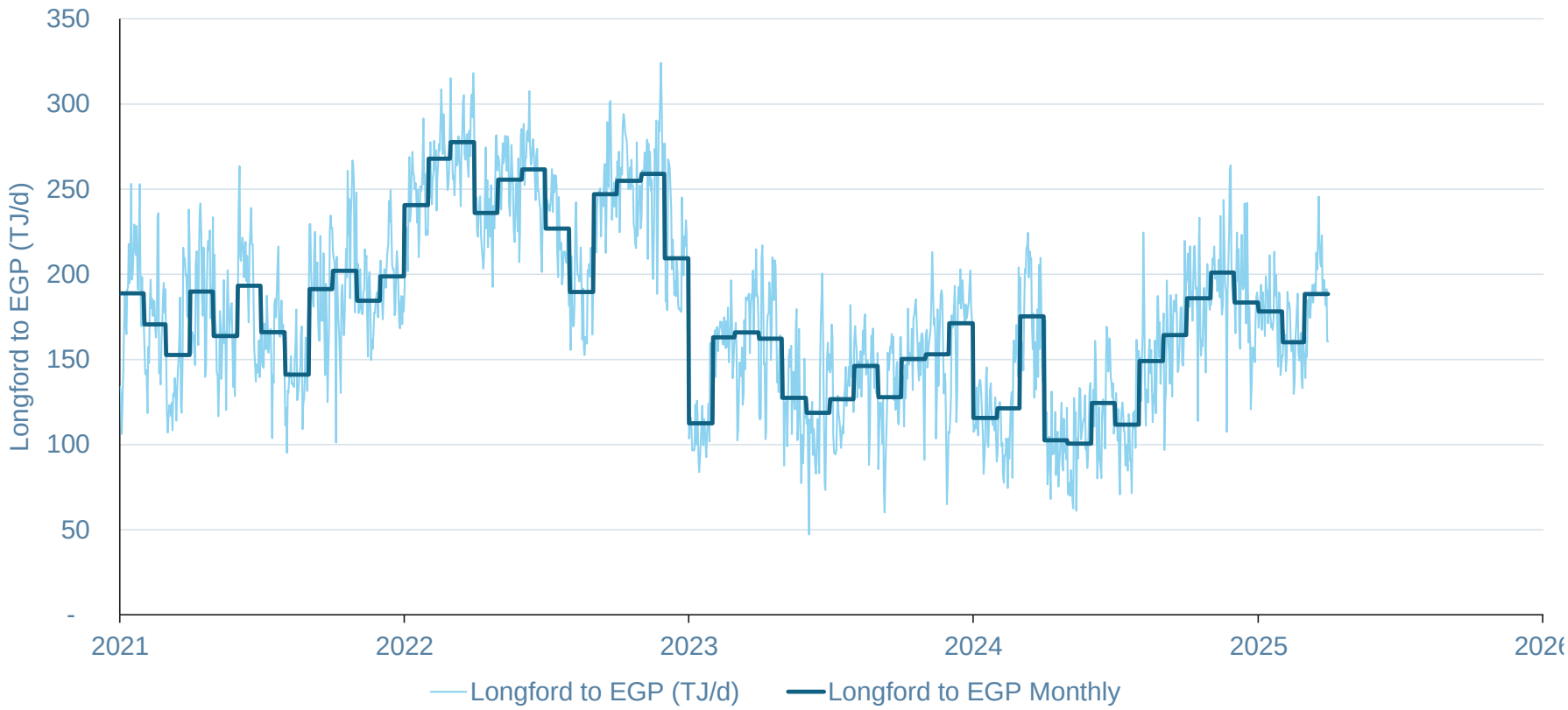
- Economics are based on the international gas prices
- Highly volatile. Global influences.

Port Kembla Complications

- Hoegh Galleon is currently in Egypt
- Second FRSU has arrived

Physical delivery of LNG will be difficult

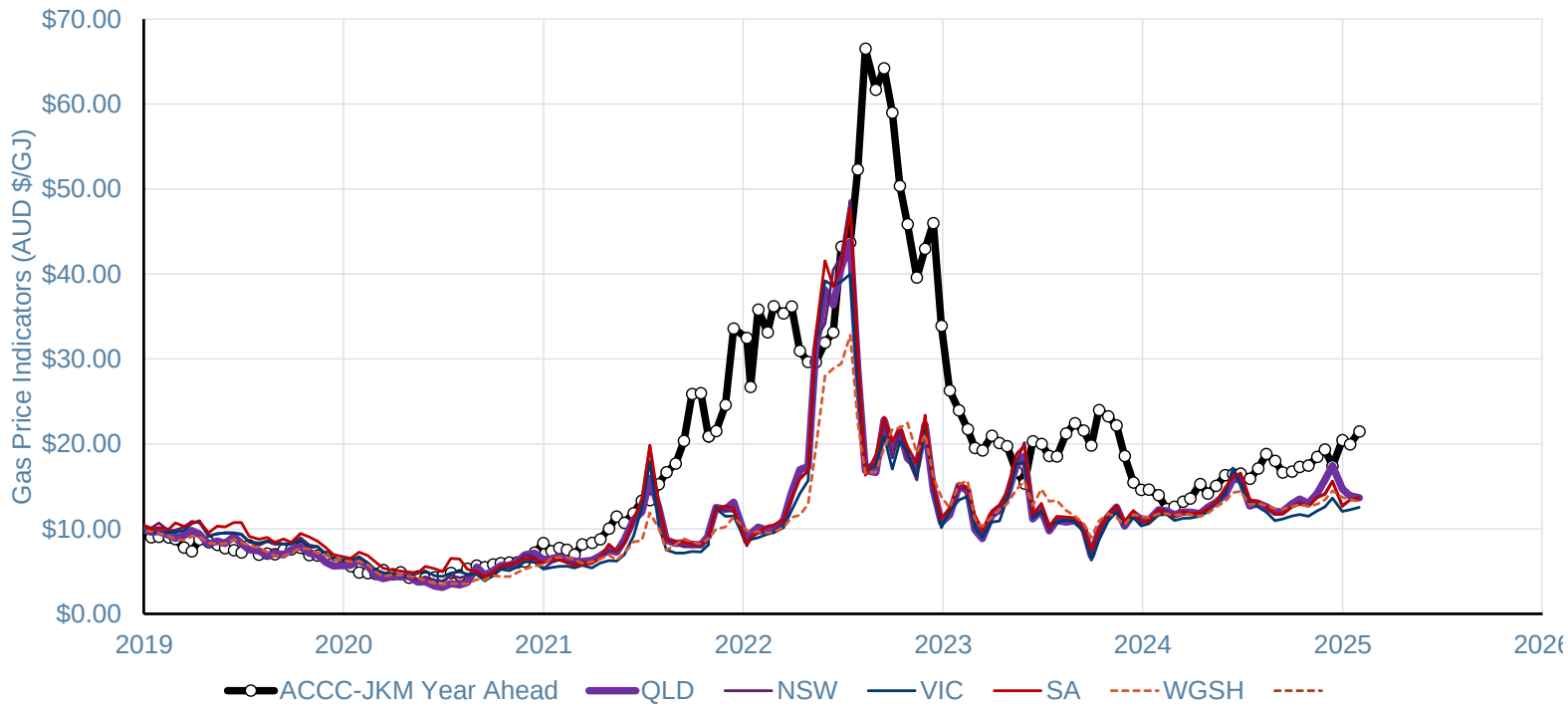
- Eastern Gas Pipeline has limited direct gas consumption



Longford to EGP Gas Deliveries

LNG Imports

- GSOO applies LNG Import solutions with consideration of deliverability
- LNG Imports will embed international gas prices into the Southern Gas Market
  - For better or worse

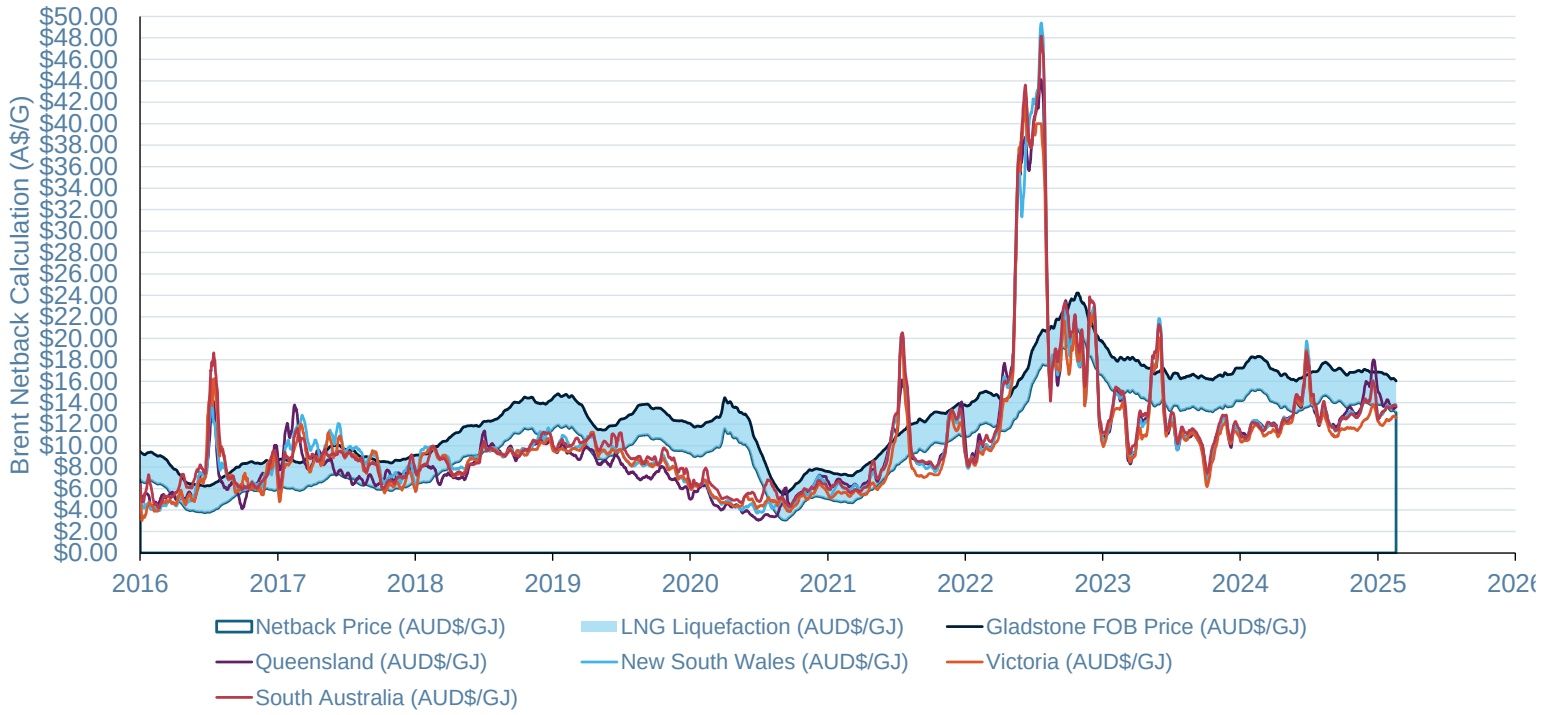


Domestic gas prices vs ACCC JKM Netback Year Ahead

Source: ACCC, AEMO via Energy Edge

LNG Imports

- Brent netback prices are still higher than domestic gas prices
- LNG Imports will embed international gas prices into the Southern Gas Market
  - For better or worse



Domestic gas prices vs Brent Netback

Source: ICE, AEMO via Energy Edge

Potential Solution #4

Demand Substitution

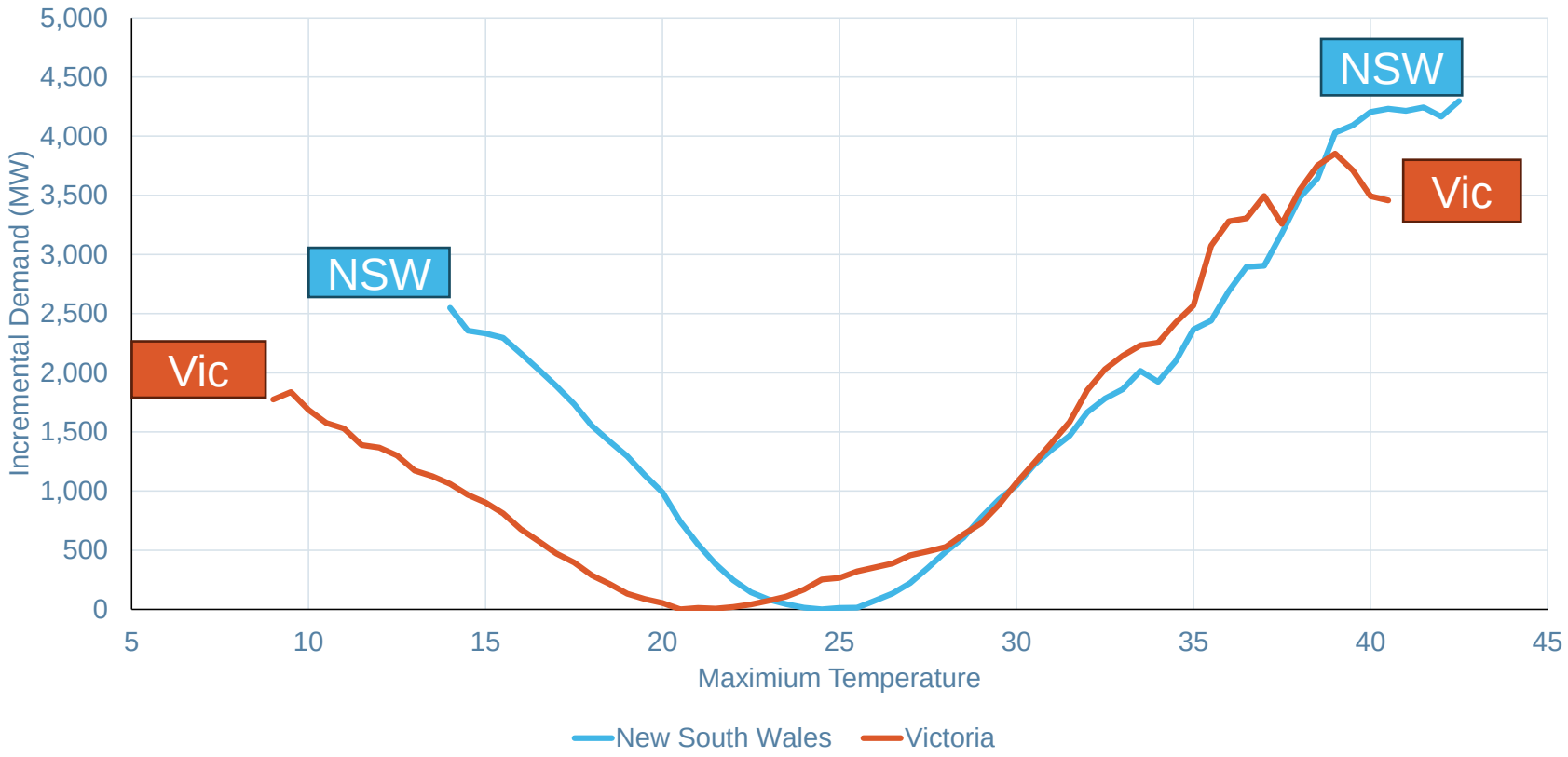
Electricity: Weather Dependency

NSW Electricity response to weather is **Symmetric**

- Hot: Substantial increase
- Cold: Substantial increase

Victorian Electricity response to weather is **Asymmetric**

- Hot: Substantial increase
- Cold: Moderate increase



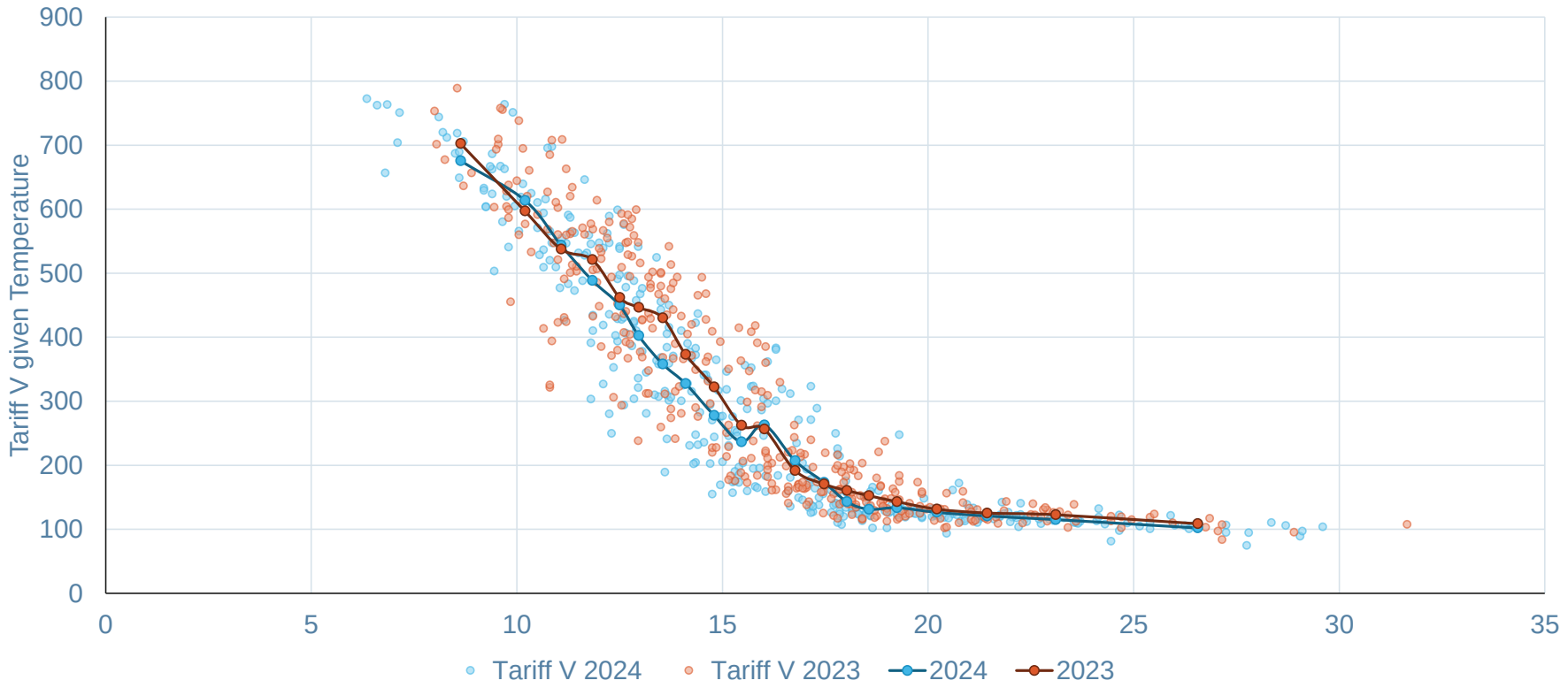
Victorian Underlying Peak Electricity Demand given Daily Temperature

Source: BOM, AEMO via Energy Edge

Vic Gas: Weather Dependency

Victorian Gas response to weather is **Asymmetric**

- Hot: No increase
- Cold: Substantial increase



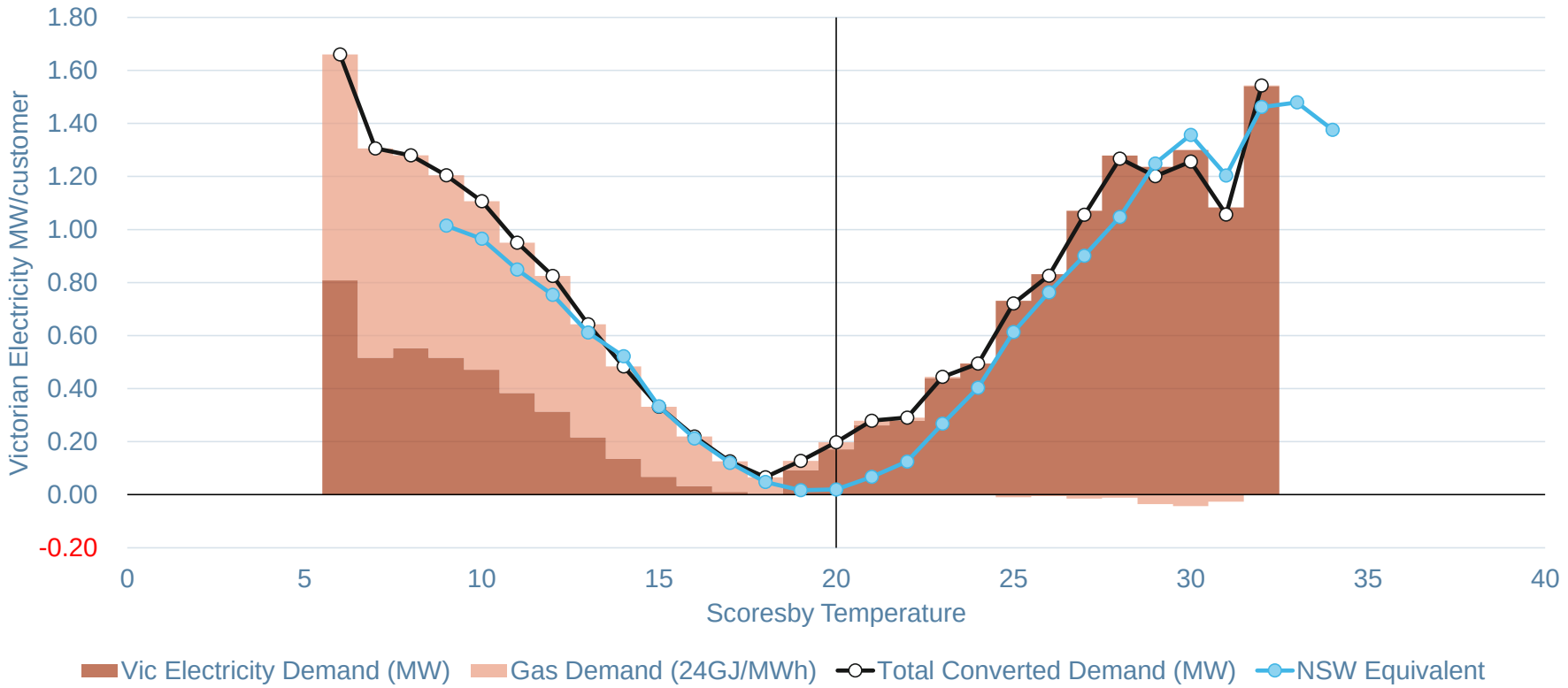
DWGM Gas Demand given Daily Temperature

Source: BOM, AEMO via Energy Edge

Vic Energy: Converted Weather Dependency

If Victorian Electricity and Gas Response to Weather is shifted to be **Symmetric**

- Hot Weather: Vic Energy Demand increases substantially
- Cold Weather: Vic Energy Demand increases substantially



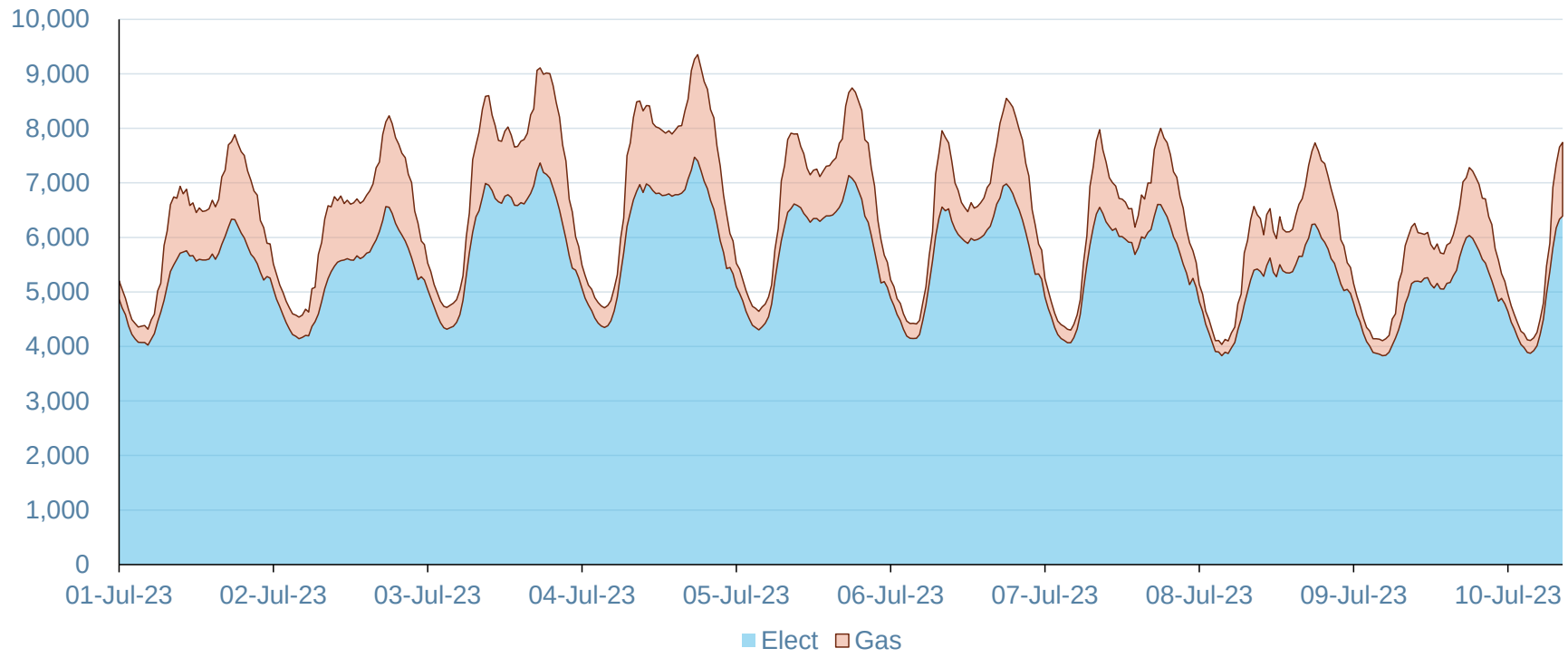
Victorian Converted Energy Demand given Daily Temperature

Source: BOM, AEMO via Energy Edge

Vic Energy: Converted Energy Consumption

Conversion of cold weather gas into electricity

- Cold Weather energy consumption can be assessed

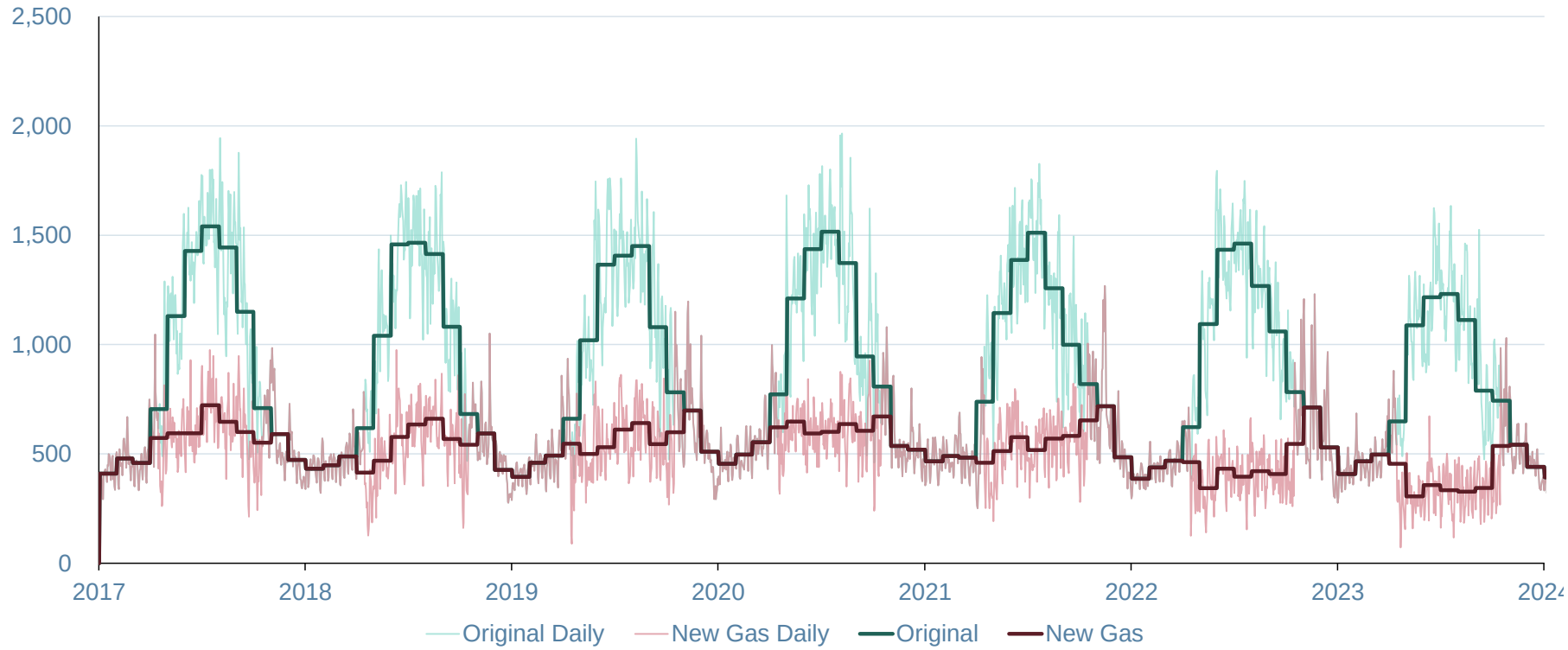


Victorian Converted Energy Demand (Historical sample period)

Source: BOM, AEMO via Energy Edge

Vic Gas Demand: Shifting weather dependency

- Historical Southern Gas Market gas demand
- Green: Including winter weather dependency
- Red: Remove winter weather dependency

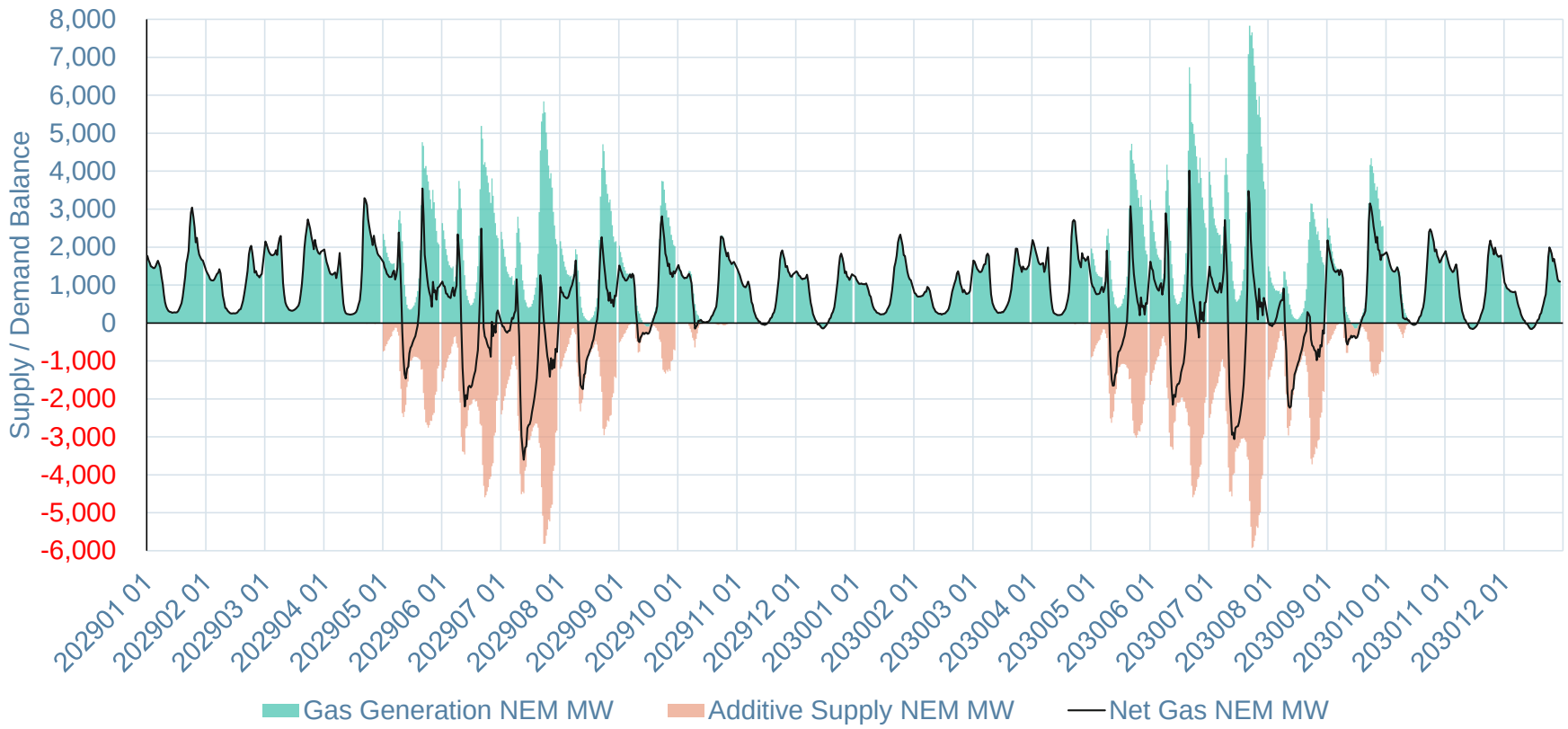


Southern Gas Market – Before and After weather dependency

After modelling…

Allowing for modelling

- Liberated gas from reduced weather dependency gas consumption is substantial
  - 100%: 60-70PJ p.a.
- Energy efficiency (reverse cycle air conditioners) is an incredible opportunity to resolve the Supply Problem



Energy Edge Modelling – Time of Day by Month for 2029 to 2030

Role of Gas: Saviour or Villain

Saviour

- Gas Substitution away from gas heating
  - Energy efficiency is a golden opportunity
  - Reduces winter capacity – not just energy
- LNG Imports and Pipeline infrastructure
  - Why not have both?
- Additional winter gas supplies are critical to system resiliency.
  - Winter gas covers probable cold weather, known reduced solar output, potential wind droughts and potential coal outages

Villain

- Local gas supplies within the Southern Gas Market are declining rapidly
  - Replacement gas supplies have been delayed or disappointing
- Gas generation capacity requirements are growing to manage coal exit
  - Gas turbine lead time has extended to 6-8 years

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