GAS PRICE PROJECTIONS for the 2021 GSOO

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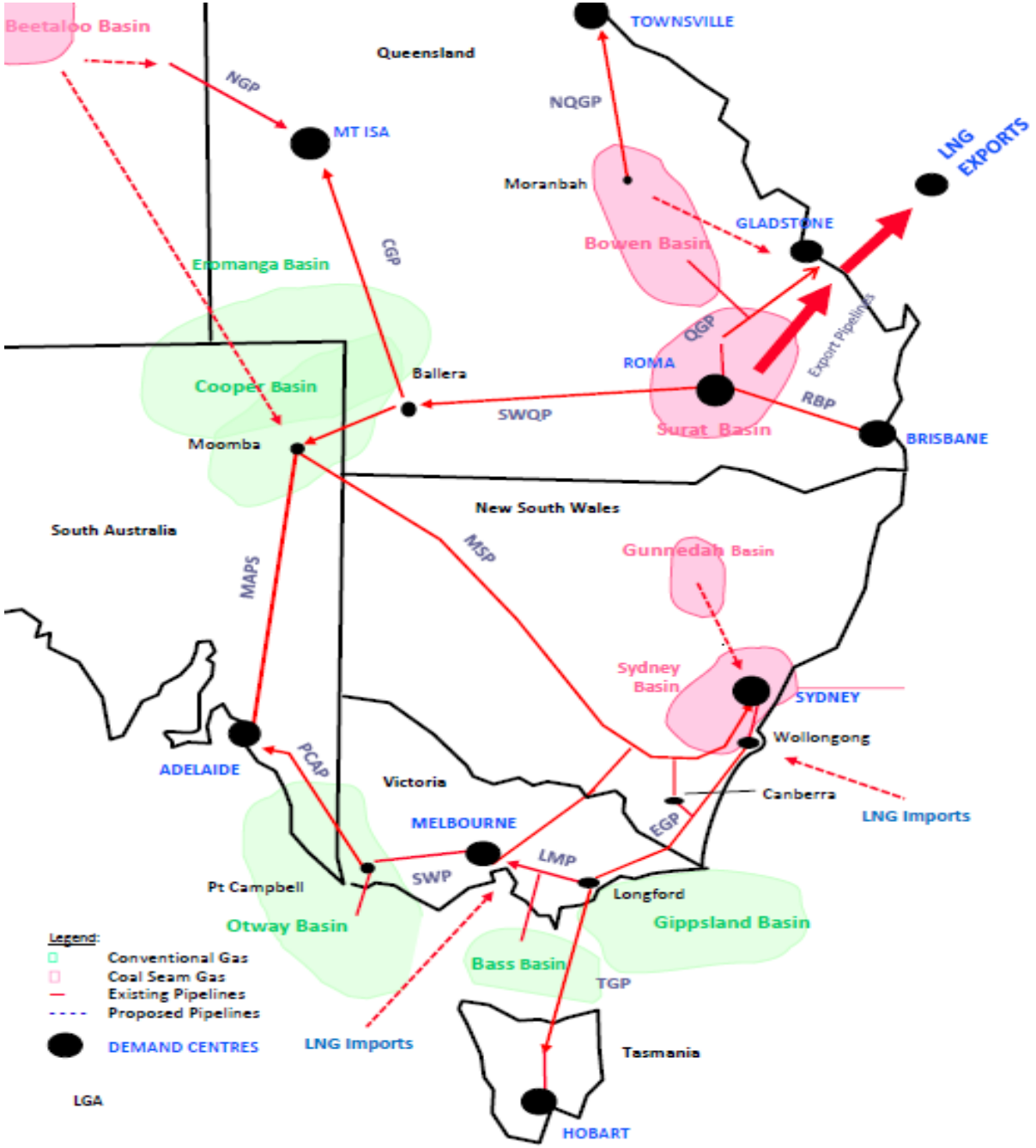
Features of the Eastern Australian Gas Market

- Eastern Australia is served by an interconnected pipeline grid linking:

1. Significant gas resources, mainly unconventional
2. A mature domestic demand sector
3. A recently developed export sector

- The advent of exports has coincided with the decline of older resources and a significant rise in domestic prices.

Eastern Australian Gas Resources, Infrastructure and Markets

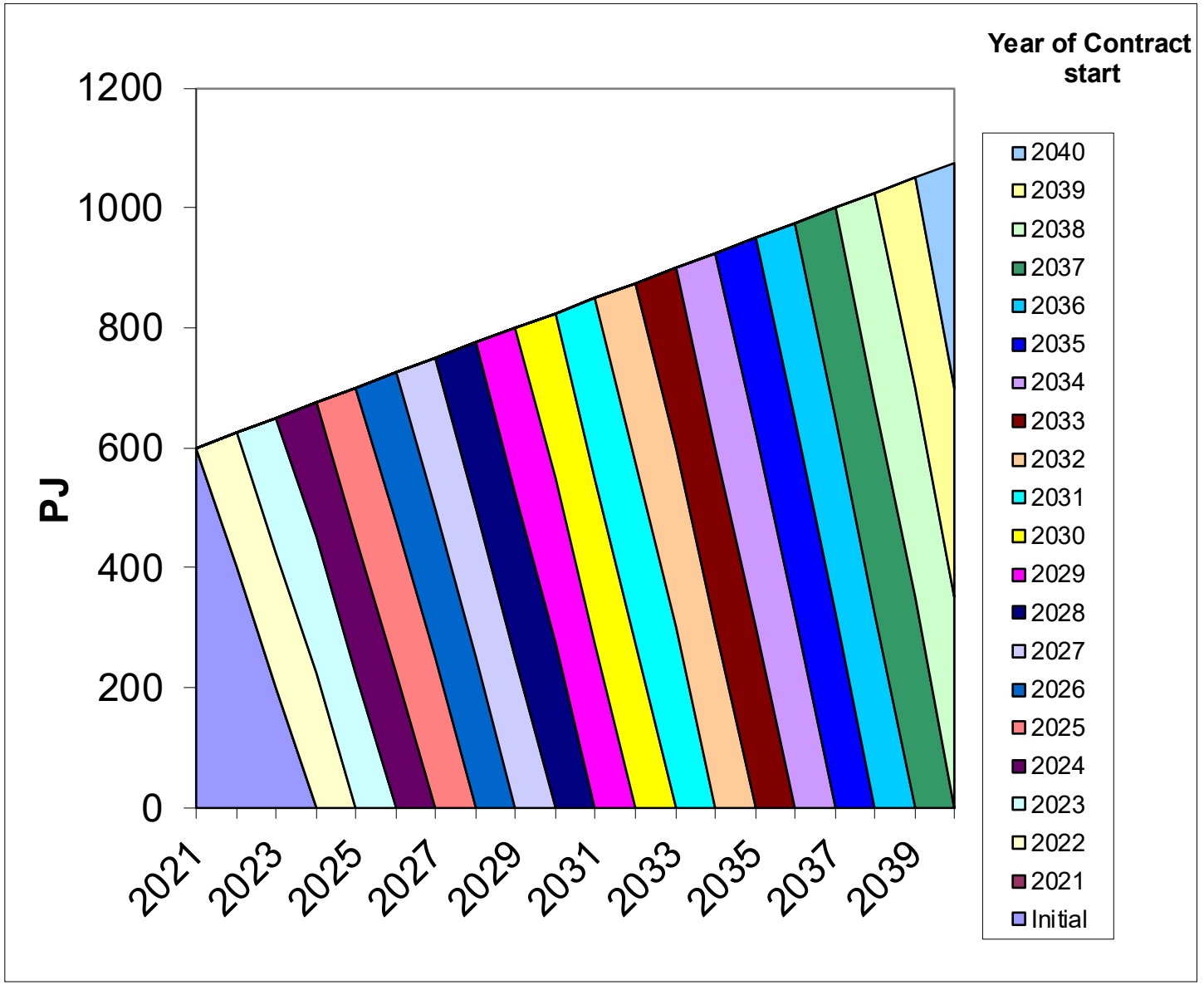


Methodology

- Methodology captures the realities of the market
- Prices are the outcome of demand-supply balance in the New Contracts market, which brings incremental gas to the market
- New Contract Demand (year x) = Gap between 2020 GSOO demand forecasts and previously contracted gas (cum to year x-1)
- 3-year new contracts assumed - existing contracts input

Contract Build Up (Hypothetical)

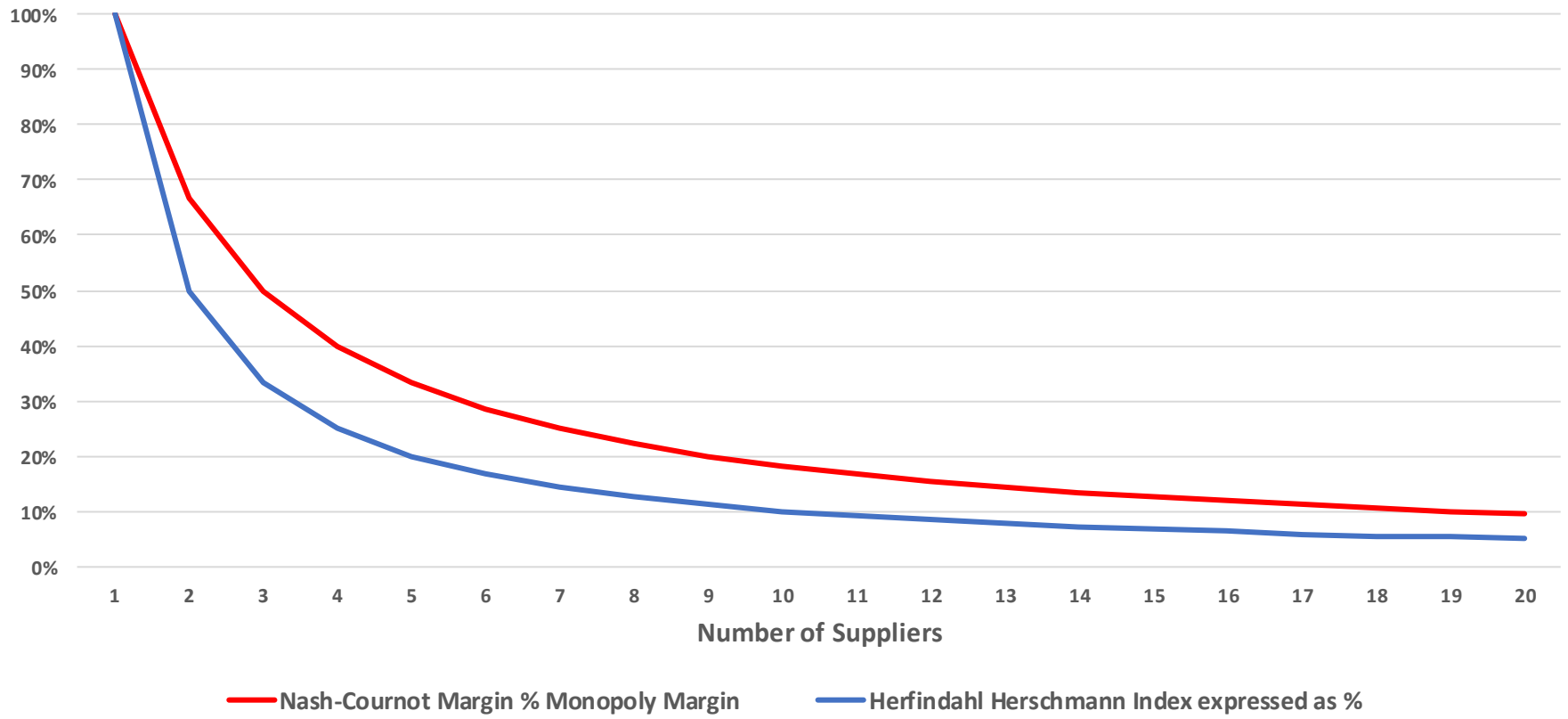
New contracts are entered each year to add up to demand



Methodology contd.

- Potential Supply Available = Uncontracted capacity, based on reserves, development timing. Reserves from Wood Mackenzie and Queensland Government
- New Contract Supply Cost = 2P undeveloped or 2C, depending on gas source
- Range of production costs provided to AEMO by Wood Mackenzie. Used 50% to 100% of range for 2P and 15% to 50% of range for 2C to derive scenarios
- Each supply project is regarded as a separate producer
- Distributed market solution – producers compete to maximise profits across 10 zonal markets
- Solution uses Nash-Cournot game approach – level of competition determined by the inputs
- Can model separate marketing and ownership of multiple projects

Nash-Cournot relative profit margin vs Herfindahl Herschmann Index expressed as %



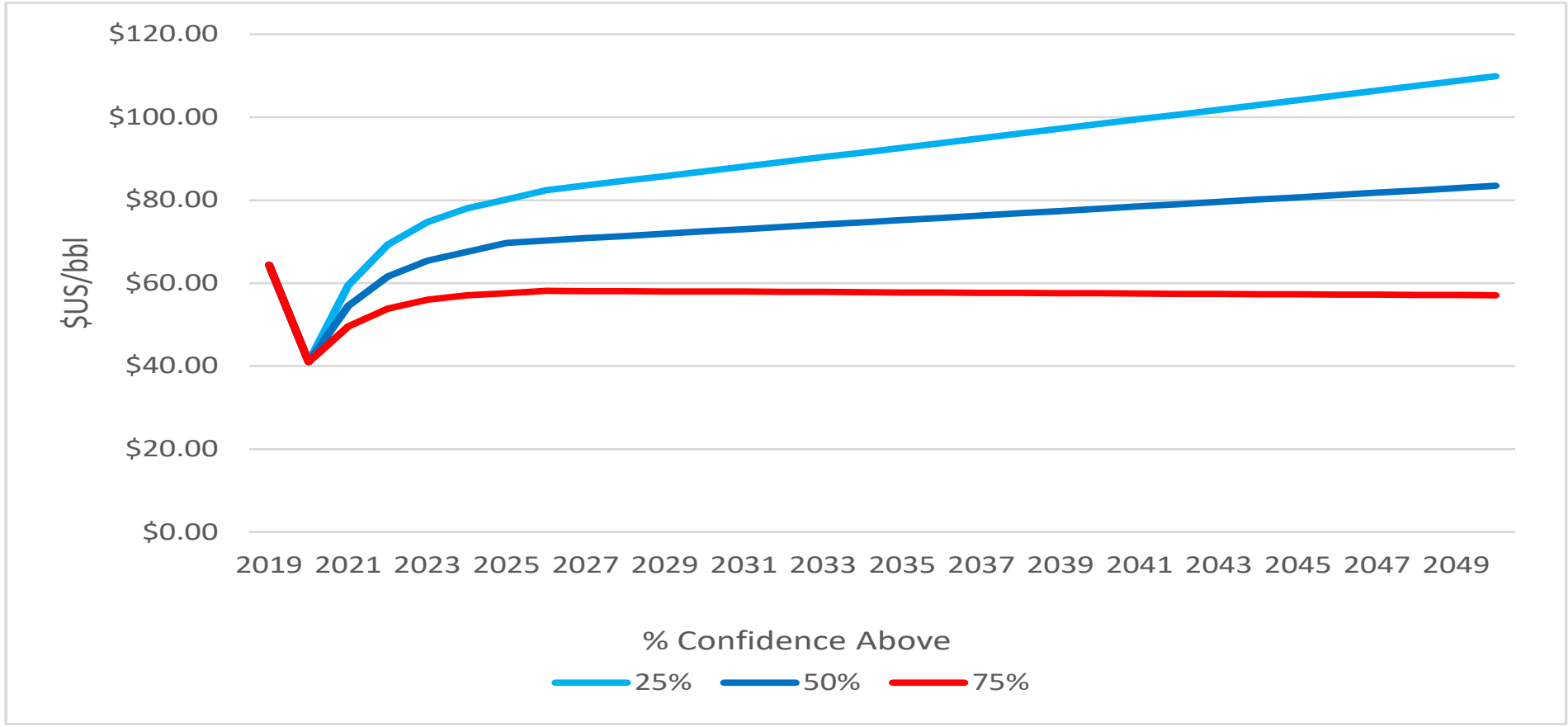
Methodology contd.

- LNG market represented – Queensland exporters compete with global suppliers
- Captures impact on domestic prices without having to assume netback pricing
- Oil indexation – applied ex-post by reference to known 2020 prices
- Model estimates prices for industrial (high load factor) contracts
- R&C prices estimated by adjusting transmission cost for load factor and adding a storage/balancing charge
- Initial new contract prices benchmarked to ACCC Gas Inquiry data

Methodology contd. GPG Prices

- OCGTs are important to have firm contracts – assumed firm transport pricing:
  - OCGT Price =R&C Price + locational adjustment
- CCGTs run more consistently and have a higher utilisation of their pipeline charges, reducing the $/GJ cost of the gas
  - E.g. Swanbank E
  - CCGT Price = Industrial Price + locational adjustment

Oil Price Projections – LGA analysis of EIA Data



Key Assumptions

Parameter	Central	Slow Change	Gas Led
Domestic Demand	2020 GSOO Central	2020 GSOO Slow Change	2020 GSOO Step Change
Pipeline Tariffs	ACCC	ACCC	ACCC
New Pipelines	None	None	Wallumbilla-Sydney NT-Moomba
New Gas Sources	None	None	Gunnedah, Beetaloo
Gas Reserves*	Current 2P, 2C	Current 2P, 75% of 2C	Current 2P, 2C plus addn. Gunnedah and Beetaloo
Average Gas Production Costs Undevel. 2P*	$5.35	$6.24	$5.35
Average Gas Production Costs 2C*	$7.33	$8.13	$7.04

* WoodMackenzie assumptions sourced and provided by AEMO

Key Assumptions

Parameter	Central	Slow Change	Gas Led
Number of Independent Sellers	Current number - 20	Fewer - 17	More- 32
Initial Domestic Contracts*	Current	Current	Current
LNG Contracts*	Est Actual Contracts	2020 GSOO Slow Change Export Forecasts	Est Actual Contracts
Heads of Agreement	120 PJ capacity	Discontinued	120 PJ capacity
Exchange Rates**	Medium $A	Low $A	Medium $A
Oil Prices	50% probability of exceedance (Med)	25% probability of exceedance (High)	75% probability of exceedance (Low)

* LGA estimates ** BIS Oxford Economics provided to AEMO

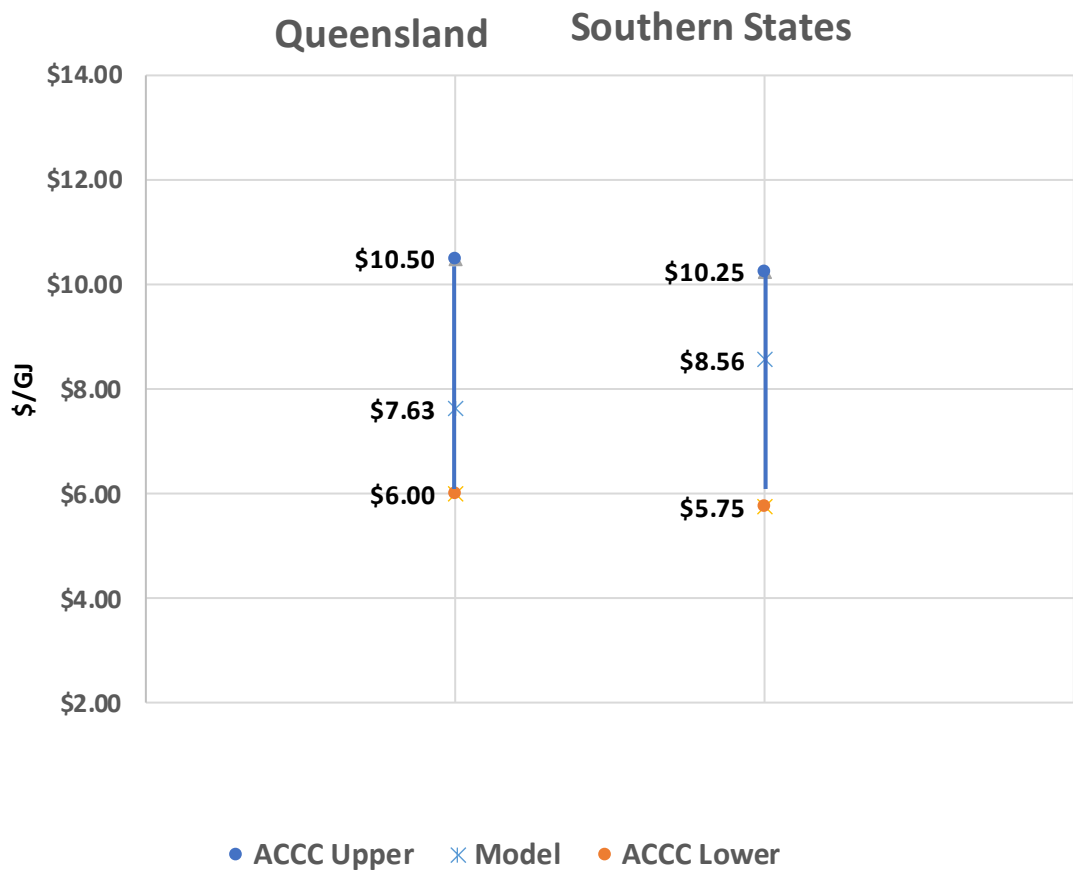
Benchmarking

Comparison of New Contract Prices for Industrial Users with Producers for 2021:

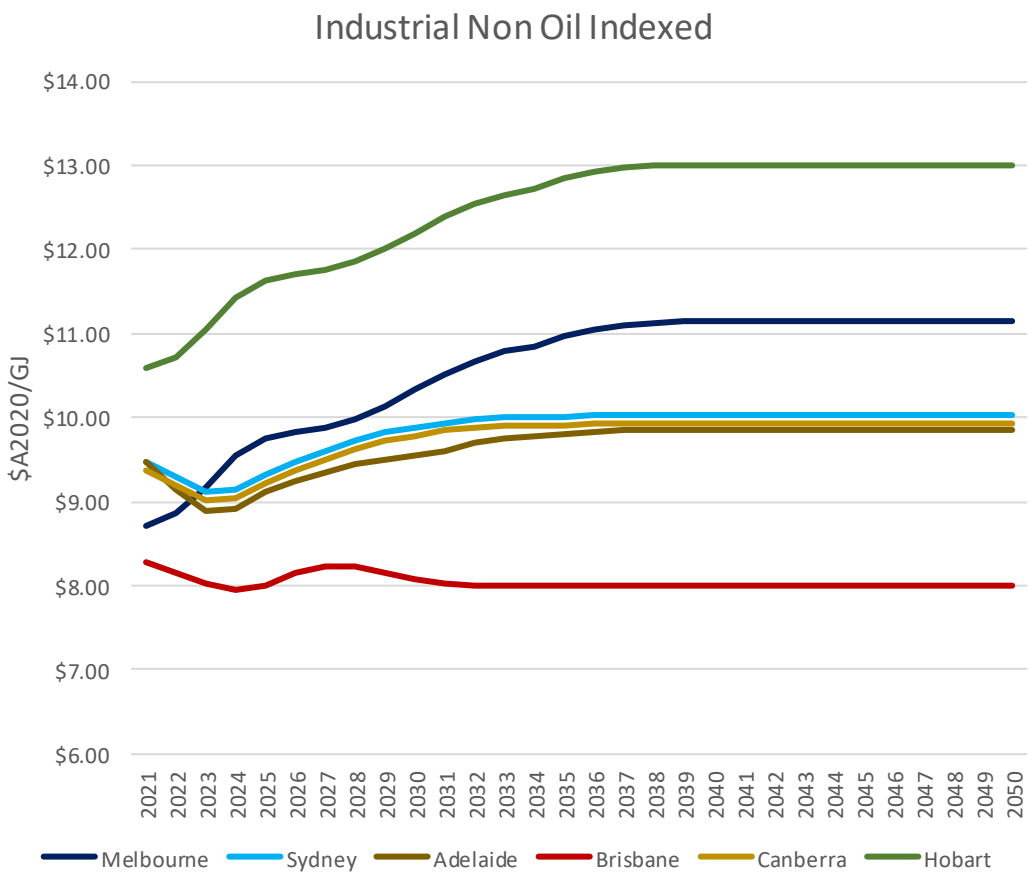
ACCC Gas Inquiry (January 2021, section 3.4.2)

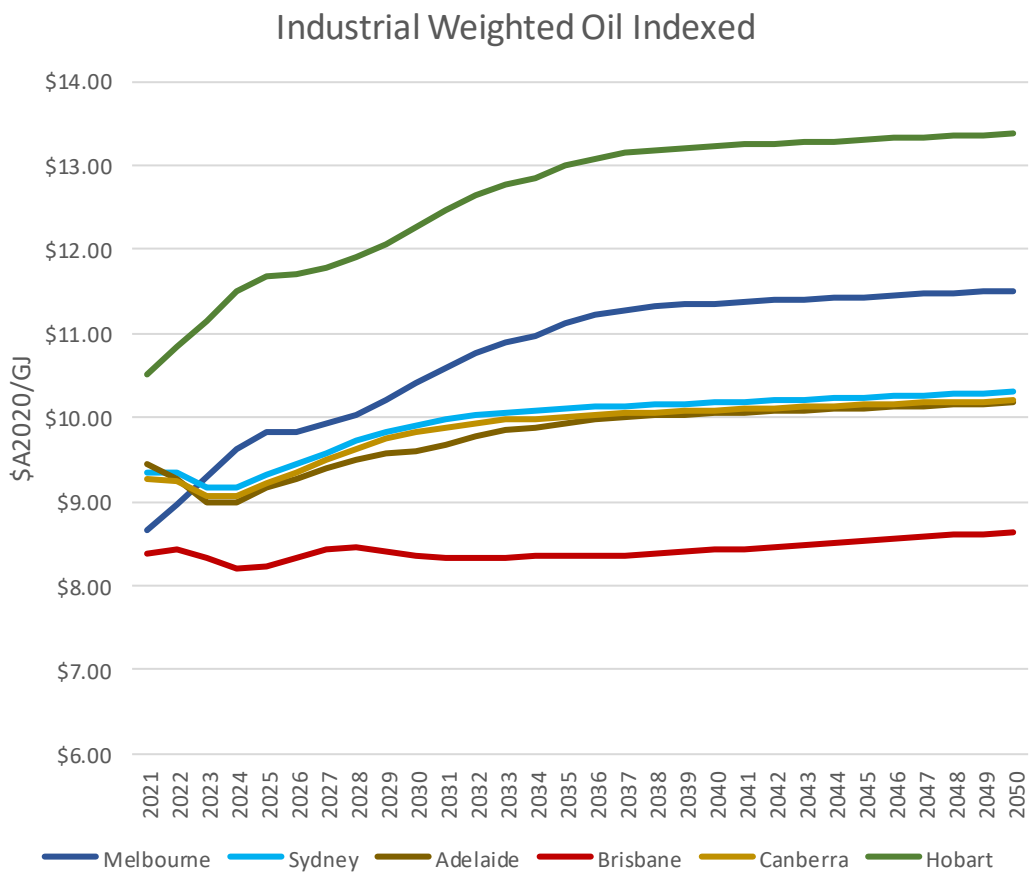
Vs

LGA Model

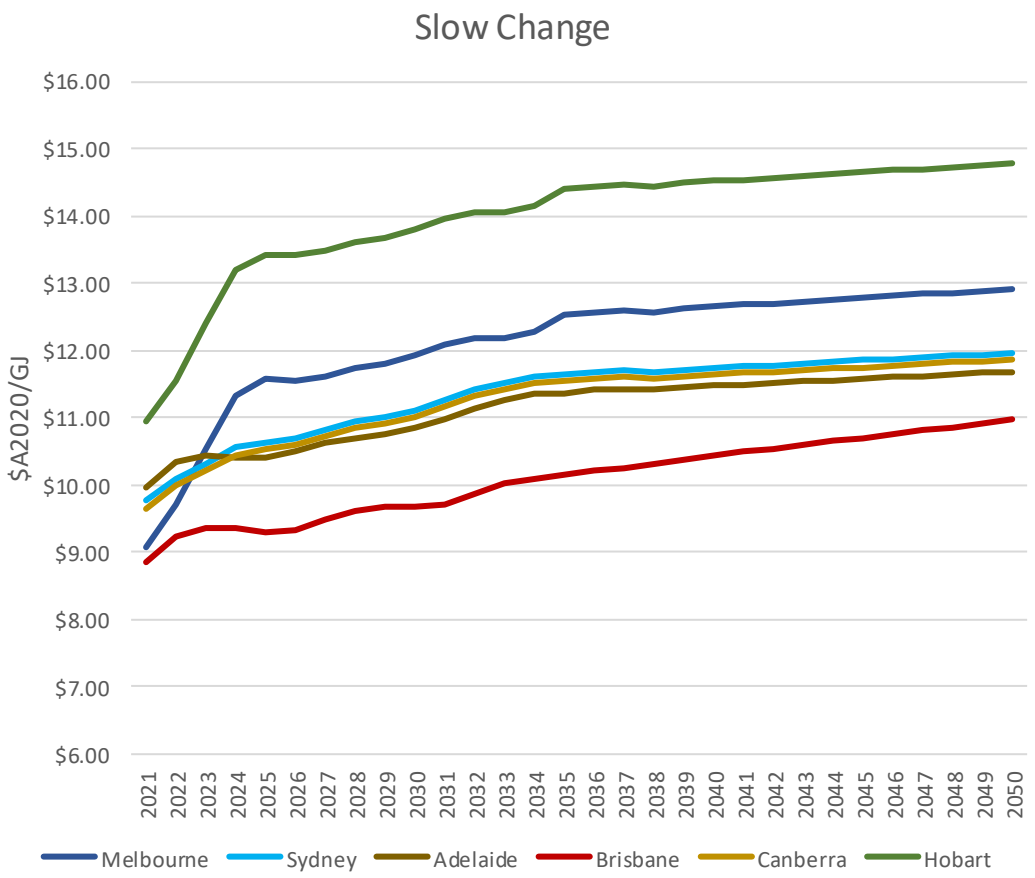


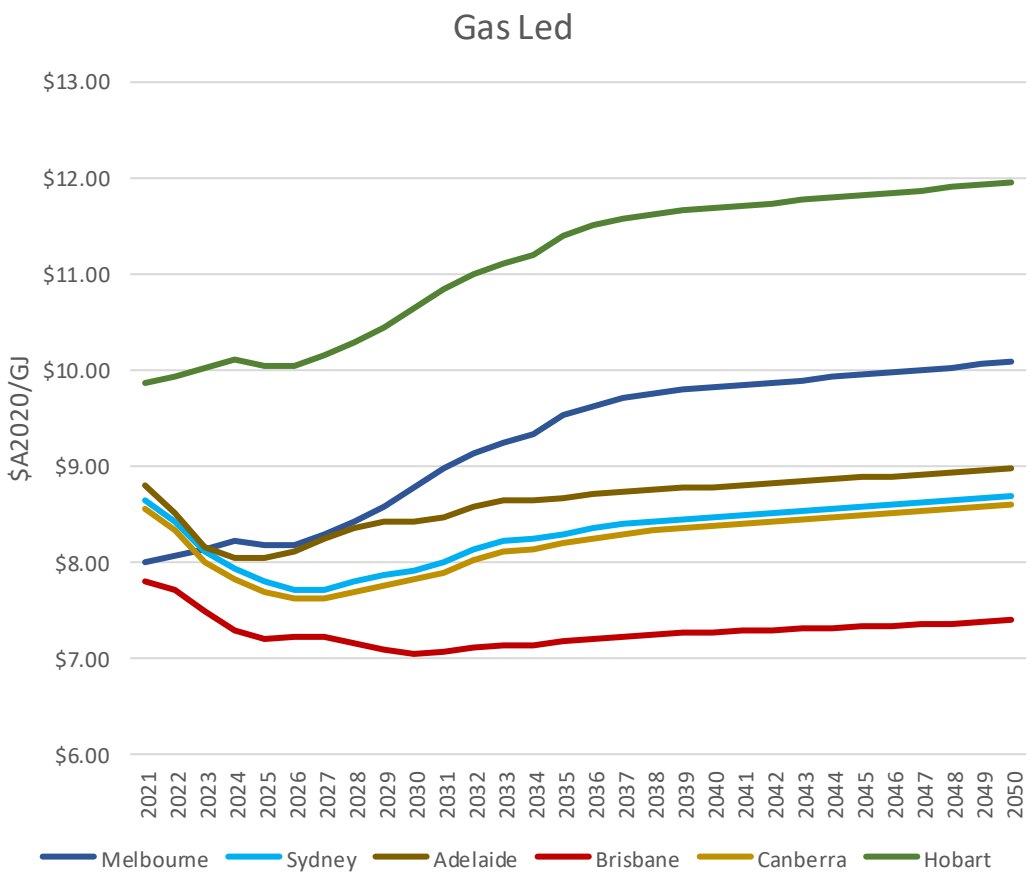
Central Scenario



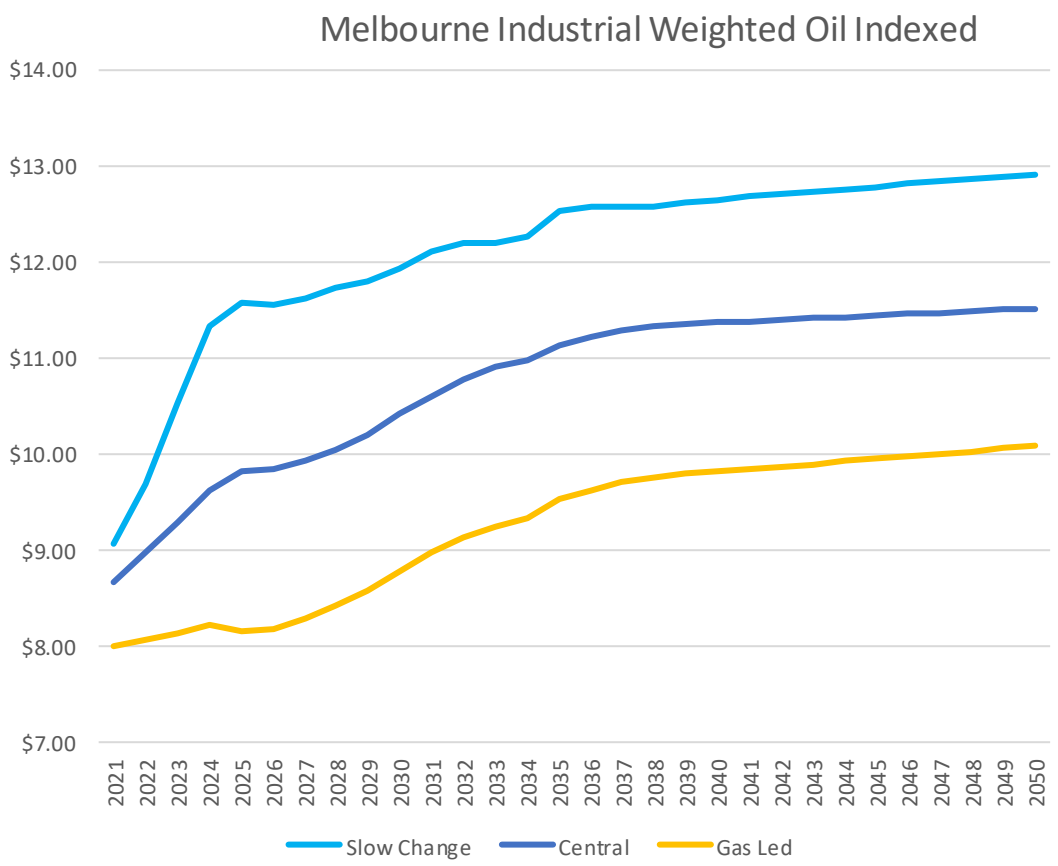


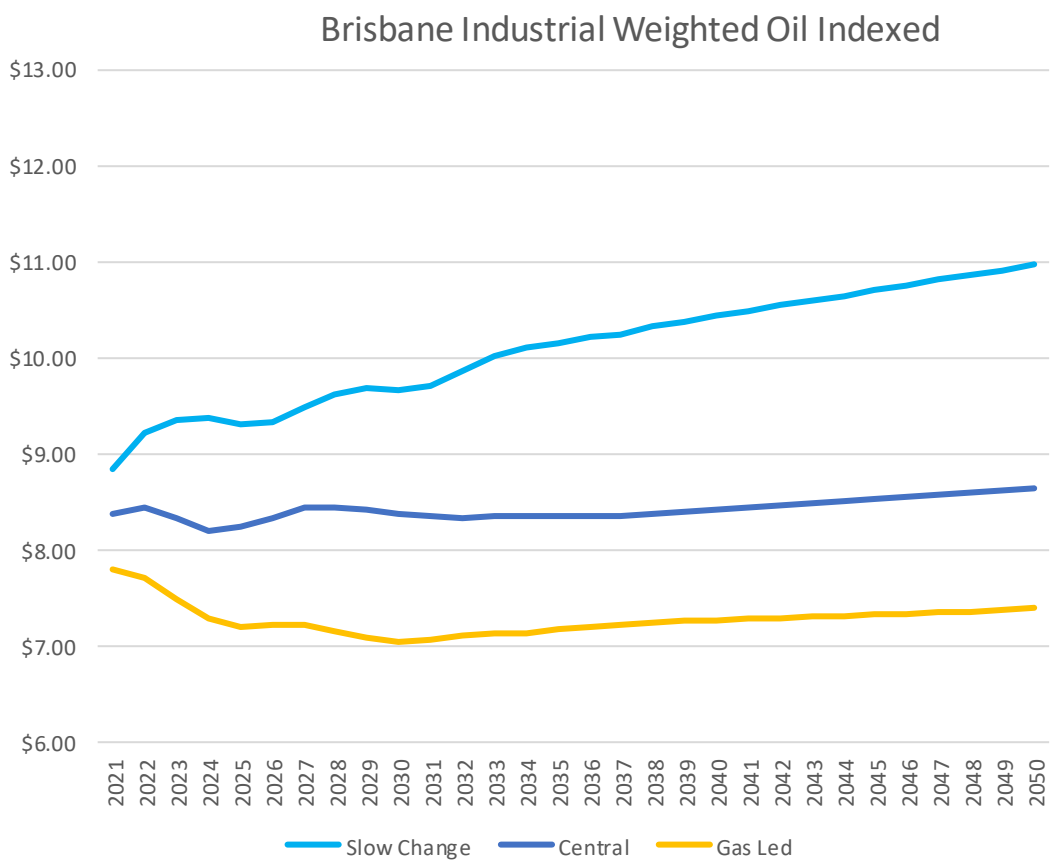
Slow Change and Gas Led Scenarios (weighted oil indexed)





Scenario Comparisons





References

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- ACCC contract prices - January 2021 interim report | ACCC
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