

# Eastern Australia Gas Market Outlook

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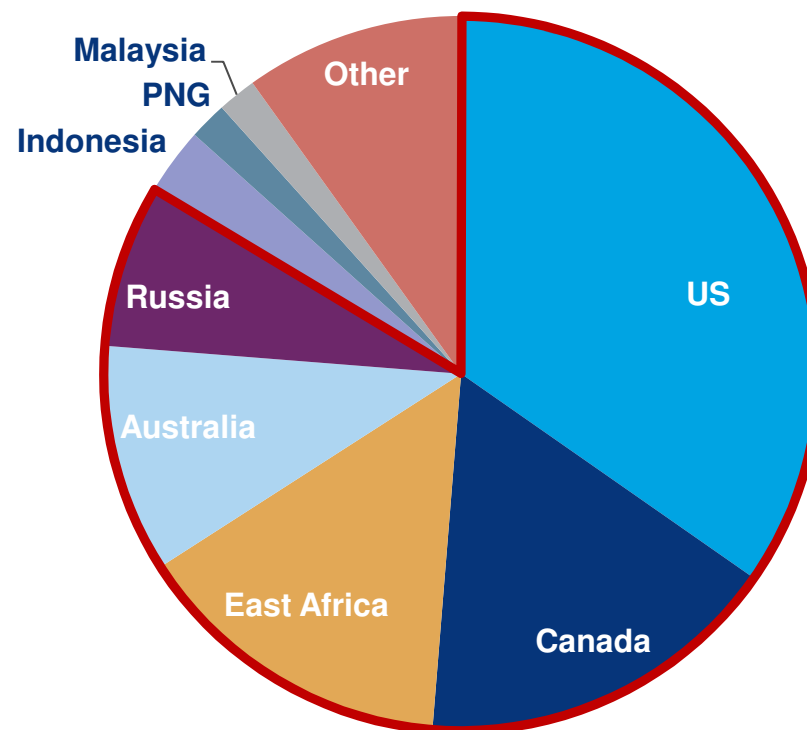
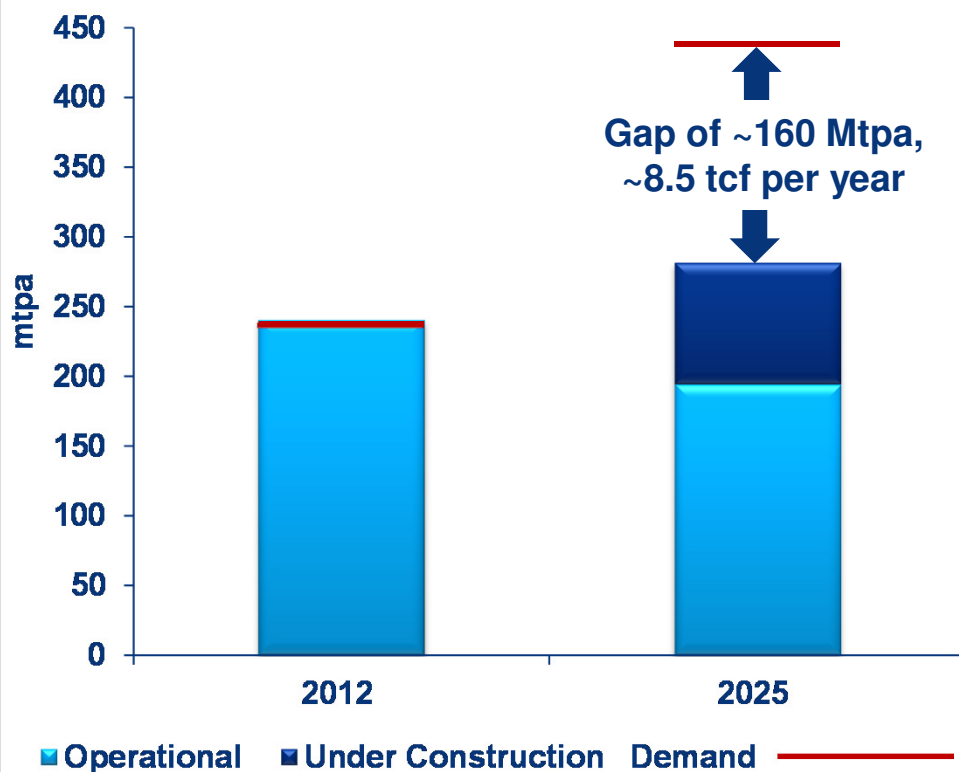
Vice President - Energy Consulting, Australasia



## Robust long-term LNG demand growth in the Pacific Basin will require significant new liquefaction capacity

Additional LNG Requirement (2025)

Potential 2025 additional capacity by country (global)



Source: Wood Mackenzie

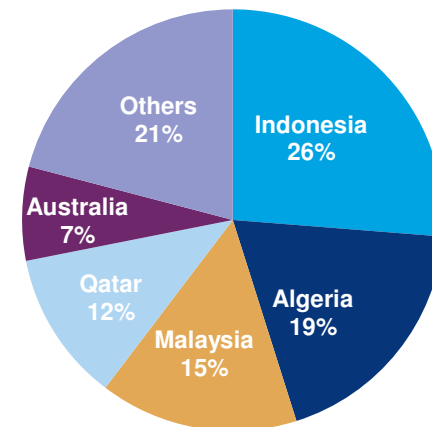
The “Big Five” of US, Australia, Canada, East Africa and Russia will provide the next wave of global LNG supply

Source: Wood Mackenzie LNG Tool, May 2013

## Australia has had unprecedented LNG build – but now faces challenges to be part of the next wave of pre-FID LNG supply

- › Australia will be the largest LNG exporting country by 2018
- › But Australia's success has created a weakness
  - strength of the A\$
  - rising costs
  - risk of project start-up delays
- › Buyers now have more options for potential future supply

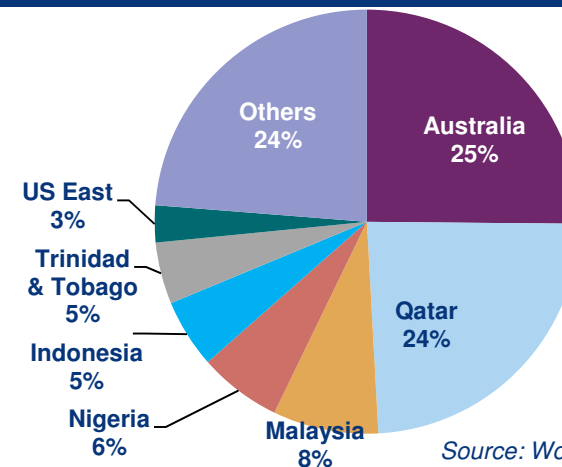
### LNG Supply (2000)



Operating

Total Supply: 108Mt

### LNG Supply (2018)



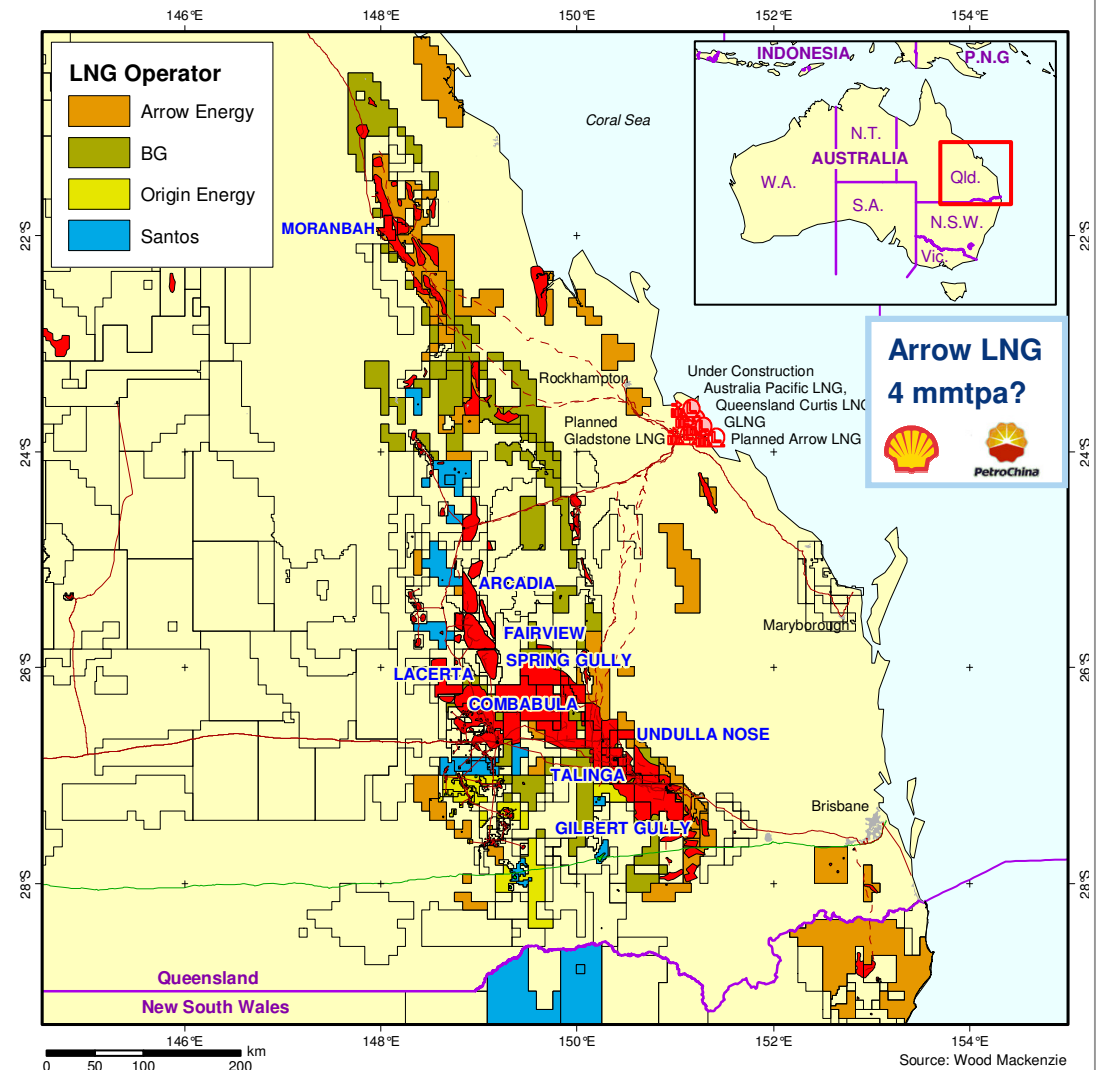
Operating, under-construction

Total Supply: 329Mt

Source: Wood Mackenzie LNG Tool, May 2013

## It is now unlikely that Arrow LNG will develop a fourth standalone CSG to LNG project on Curtis Island

- › High costs and Arrow's disperse geographic resource base are expected to have made a two train greenfield development marginal
- › Co-operating with one or more of the other proponents now seems the most viable option for Arrow LNG development (expansion train)
- › Potential synergies with upstream could be the key driver for partner selection
- › Expansion trains for other projects (eg QCLNG) seem some years away as focus now is on delivery

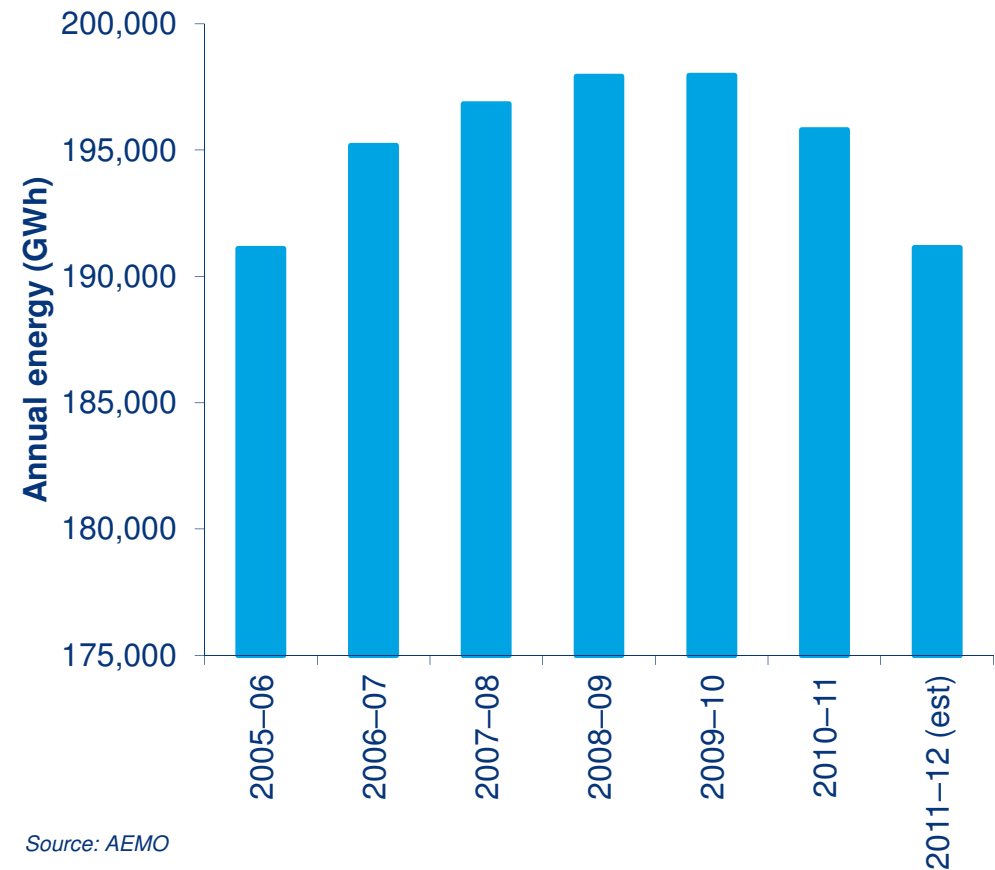


## Electricity demand in Eastern Australia has fallen dramatically in recent years

› **A number of factors have contributed to the reduction of electricity demand**

- Small-rooftop Solar PV uptake
- Solar hot water installation
- Large embedded generation
- Large Industrial closures
- Energy Efficiency/price response

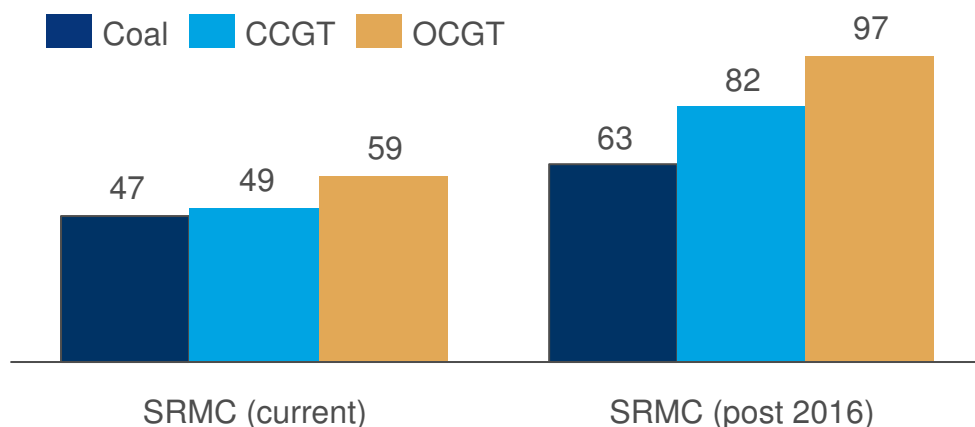
**Eastern Australia (NEM) Energy Demand**



Source: AEMO

## Gas is expected to become less competitive with coal (for existing generation) in response to forecast higher prices and lower carbon tax

### SRMC (\$/MWh)



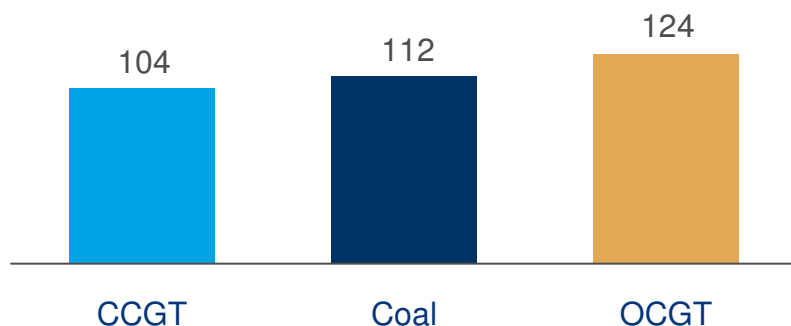
› Existing gas-fired generation is expected to become less competitive with coal generation in Eastern Australia:

- Gas prices are expected to rise much faster than coal
- The carbon price is expected to fall and could be repealed altogether

› On a LRMC basis, CCGT power generation can be competitive with coal based generation:

- Relatively higher capital cost of coal based stations
- But, subdued demand and growing wind generation may result in OCGT build being preferred over CCGT

### LRMC in long term (\$/MWh)

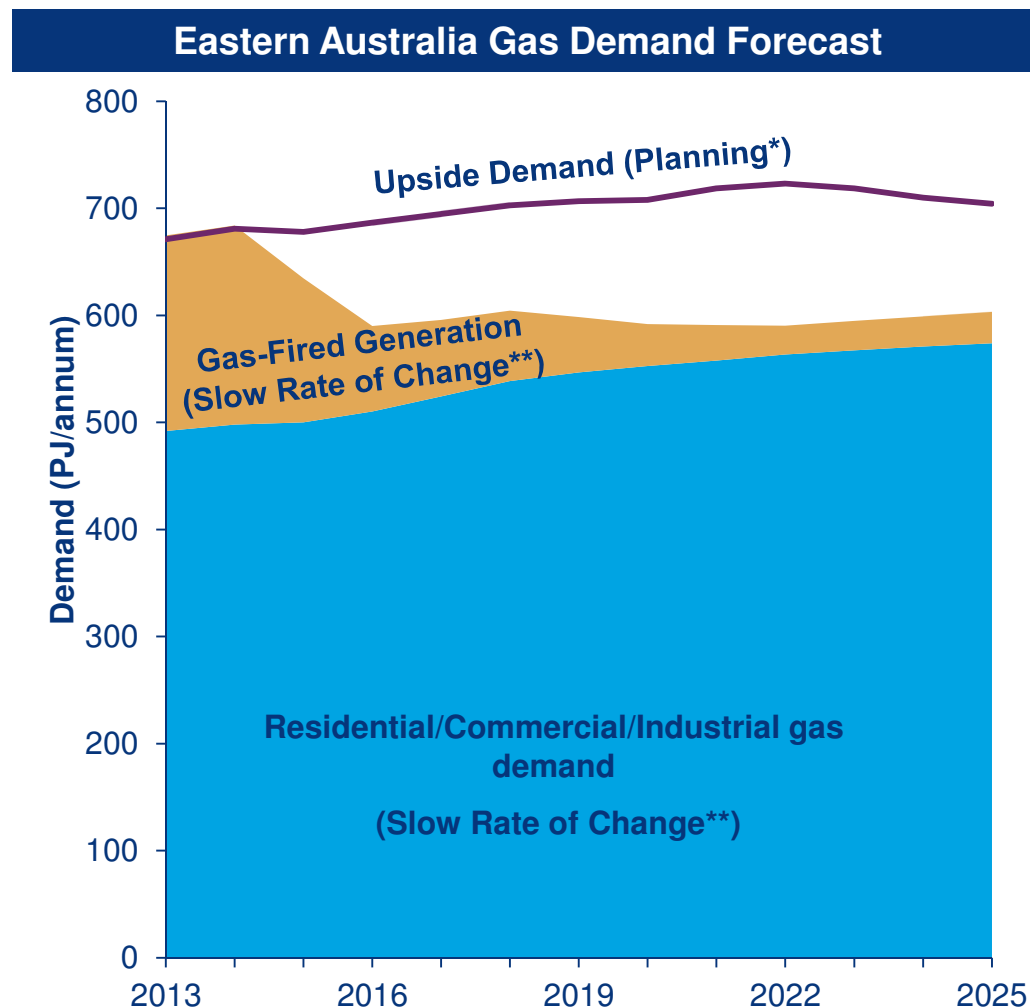


### Assumptions

Current	Carbon price	\$24/tco2
	Gas price	\$3.5/GJ
Post 2016	Carbon price	\$15/tco2
	Gas price	\$7/GJ
LRMC	Carbon price	\$15/tco2
	Gas price	\$7/GJ

## Eastern Australia's domestic gas demand outlook is highly sensitive to gas powered generation

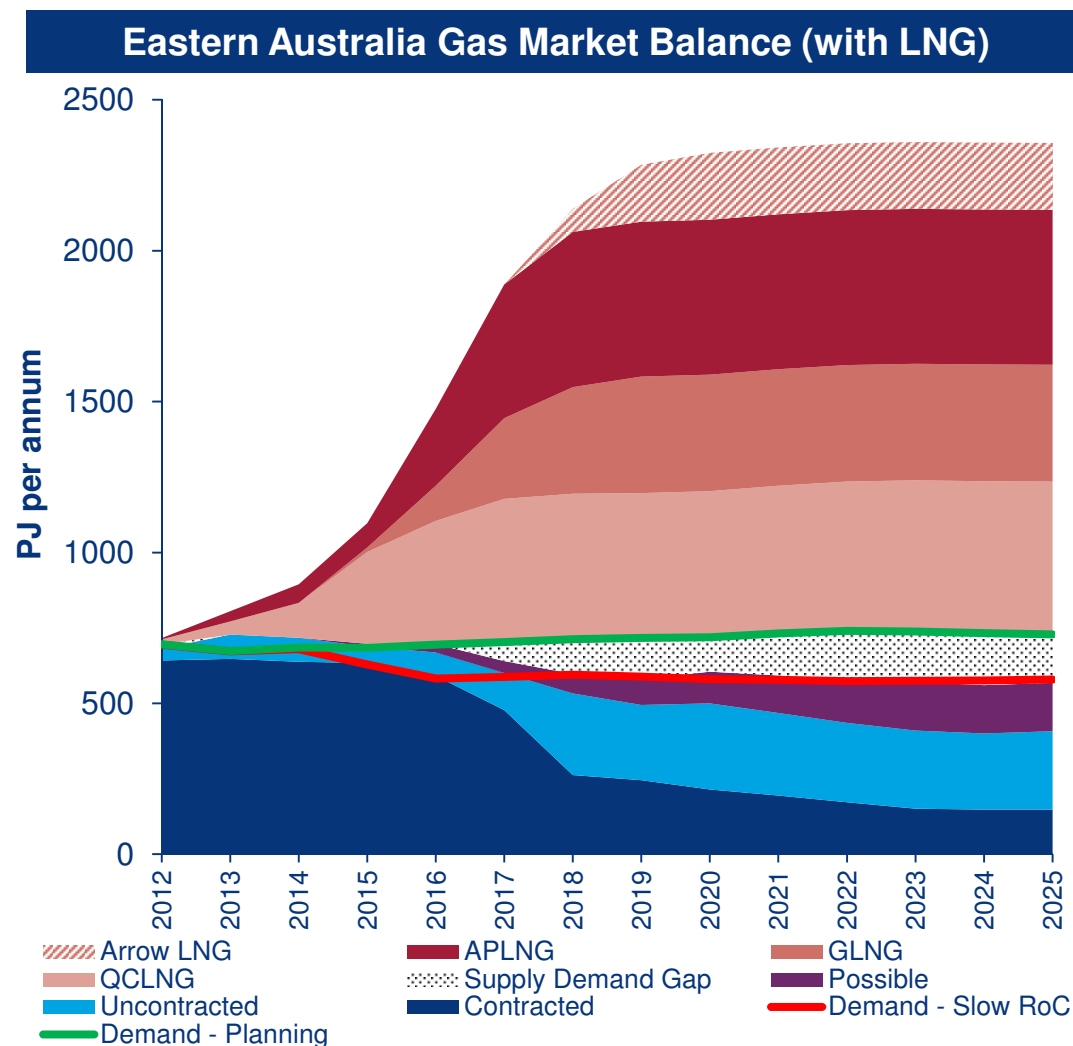
- › Residential/Commercial/Industrial demand is forecast to grow modestly
- › Gas-fired generation outlook is highly uncertain
- › Gas is forecast to be backed out of power generation as a result of:
  - Lower energy demand in electricity
  - Higher gas prices
  - Impact of growing wind generation
  - Forecast fall in carbon price



Source: AEMO 2012 Gas Statement of Opportunities (GSOO) \*Reflects a permanent price on carbon \*\* Reflects no price on carbon post-2015

## LNG export commitments and delays in NSW CSG development will constrain available supply

- › CSG to LNG requirements have created a pull on available gas supply
- › Still a large degree of uncertainty on how CSG into LNG will perform
  - Ramp-up issues will draw gas from domestic supply
  - Contracts for supply due to resource shortfall (GLNG)
  - Longer-term cost of supply and deliverability
- › Gas prices expected to be pulled towards LNG netback equivalent

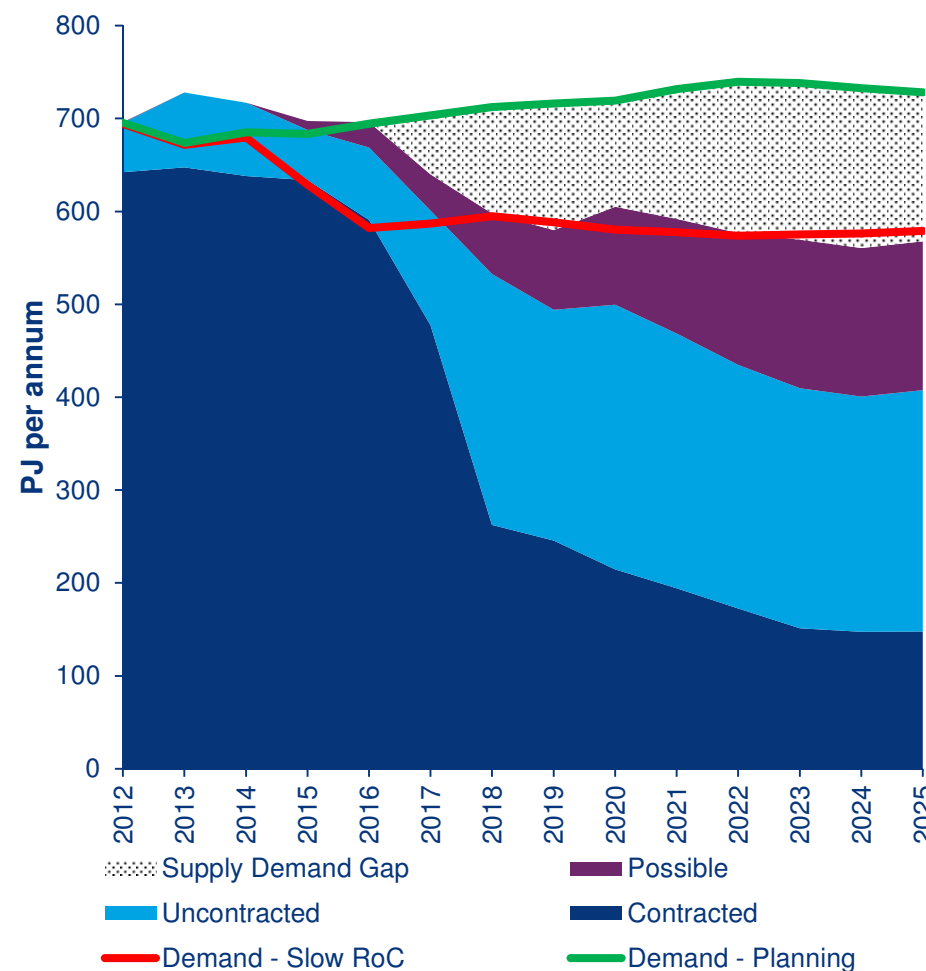




## The forecast domestic supply gap may be closing as a result of reduced demand

- › Forecast supply gap may not eventuate as demand response kicks in
  - Gas-fired generation is expected to fall in response to the challenges in the electricity market
- › Our “Possible” supply projects are largely made up of NSW CSG and therefore uncertain
  - › Gloucester and Gunnedah Basin development
- › Additional supply is expected from Cooper Basin “infill drilling” of conventional reservoirs
- › Unconventional resources are expected to take some time for material supply

Eastern Australia Gas Market Balance (without LNG)

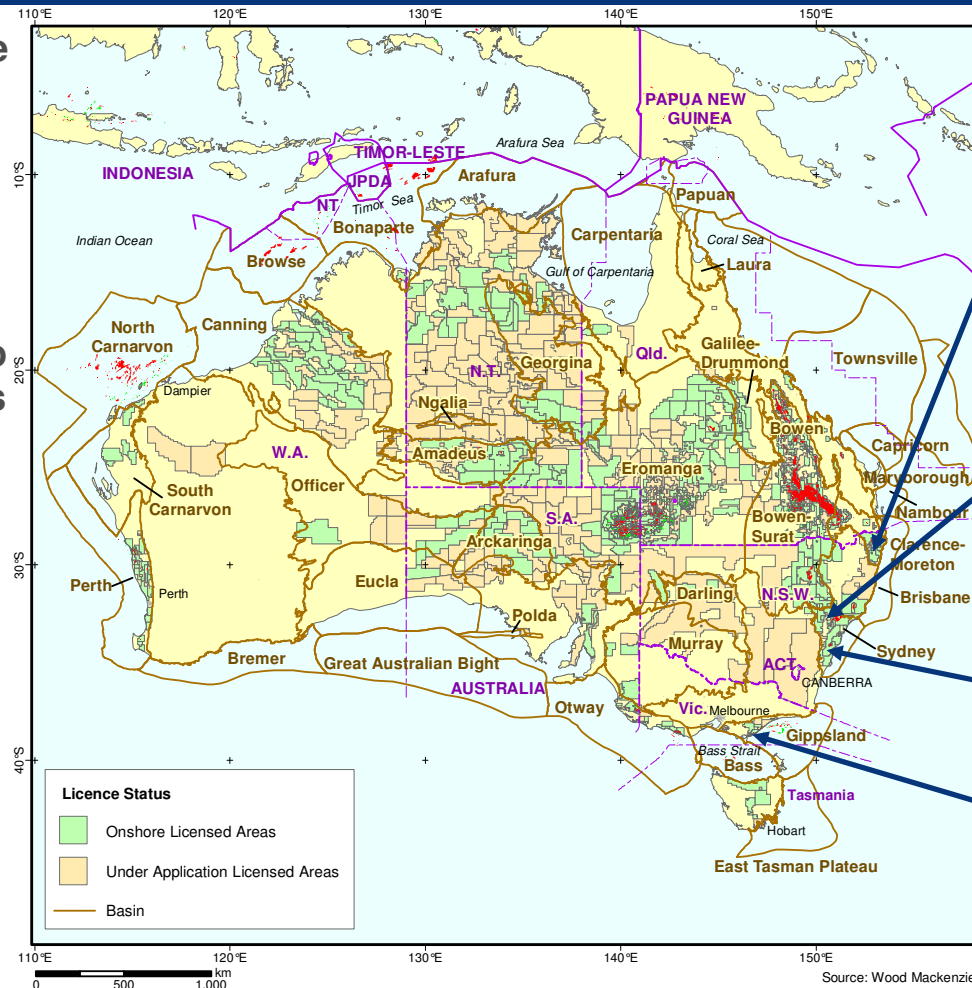


Source: Wood Mackenzie, AEMO 2012 GS00

# A number of projects have suspended activities until clearer regulation and community issues are addressed

## Slow-down in activity in Eastern Australia

- › A number of projects in the early stages of appraisal and development have been suspended due to regulatory uncertainty
- › Community issues are also slowing down the progress of exploration and development
- › Potential impact on future development funding
- › Slippage in development timelines and reduced scale of development



### Clarence- Morton

- Metgasco – suspended exploration and development activity

### NSW Hunter Valley

- Dart Energy – activities put on “care and maintenance”

### NSW Camden

- AGL– suspends Camden expansion plans

### Gippsland

- Lakes Oil tight gas – testing program suspended due to fracking moratorium

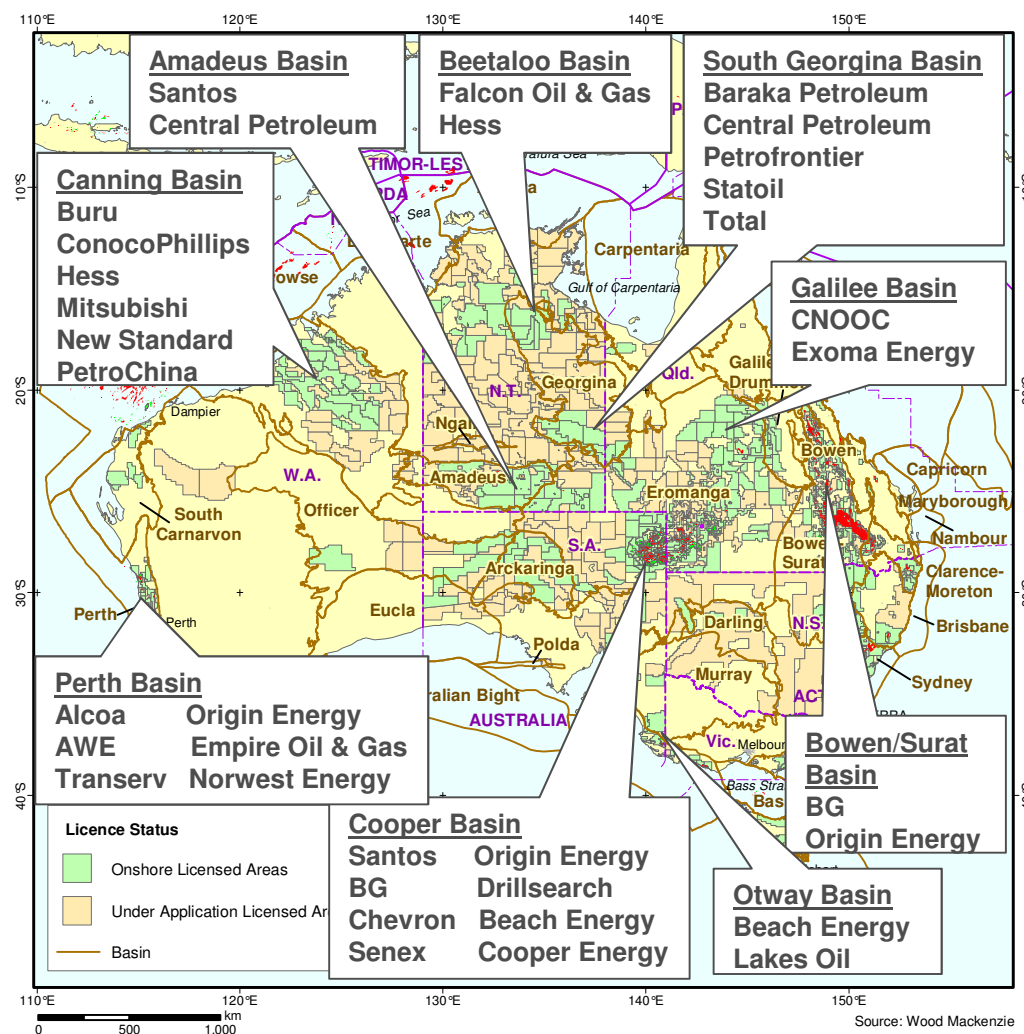
## Significant international interest is driving ~US\$1.75 bn commitment to tight / shale exploration in Australia...

Buyer	Seller	Date	Basin	Primary Target	Est. spend (US\$m)
Mitsubishi	Buru Energy	Jun-10	Canning	Gas	80
CNOOC	Exoma	Dec-10	Galilee	Oil	50
Hess	Falcon Oil and Gas	May-11	Georgina	Oil	140
ConocoPhillips	New Standard Energy	Jul-11	Canning	Gas	110
BG	Drillsearch Energy	Jul-11	Cooper	Gas	130
Senex Energy	Planet Gas	Aug-11	Cooper	Gas	30
Beach Energy	Territory Oil and Gas	Oct-11	Bonaparte	Oil	36
Statoil	Petrofrontier	Jun-12	Georgina	Oil	230
Santos	Central Petroleum	Oct-12	Amadeus	Gas	150
Total	Central Petroleum	Nov-12	Georgina	Gas	190
Chevron	Beach Energy	Mar-13	Cooper	Gas	349
<b>TOTAL</b>					<b>1,495</b>

Source: Wood Mackenzie, Company Reports

- › In addition, the Santos-operated Cooper Basin JV (CBJV\*), has dedicated around **US\$250 million** to exploration over the next two to three years

CBJV\* SA - Santos (66.6%), Beach Energy (20.2%), Origin Energy (13.2%)  
 CBJV\* QLD - Santos (60.1%), Beach Energy (23.2%), Origin Energy (16.7%)



## **Australian Unconventionals are expected to take some time to develop as a material source of supply**

### **› International interest in Australian unconventional continues to grow**

- Chevron, PetroChina, Statoil, Total are new entrants in 2012/13

### **› Committed spend continues to be spread across multiple basins and the level of wells drilled remains relatively low**

- Canning, Cooper and Central Australian basins are attracting the most significant commitments to date
- Focussed, material spend required to break open a new play
- Service sector (rigs, fracturing units etc) will require a significant commitment to be established

### **› No “game changers” seen so far**

### **› But when and how will unconventional impact on the supply picture?**

- Cost of supply is key

## Eastern Australia Domestic Gas Market Implications

- › **The forecast supply to demand shortfall of gas in the Eastern Australia market may not eventuate**
  - The pull of gas supply to support CSG to LNG development and delays in approval of NSW CSG developments had created concerns for a supply shortfall in Eastern Australia
  - However, subdued demand in the power market, rising gas prices and forecast fall in the carbon price may result in gas demand into power falling
  - Gas prices are still forecast to trend upwards in the medium term, based on LNG net-back pull
- › **New supply sources are required to provide relief to supply and prices**
  - NSW CSG projects
  - Unconventional supply is likely to be higher cost and take longer to understand – but associated liquids could change this view
  - Short term higher prices may help in encouraging more exploration and competition for supply

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