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**MAXIMISING THE COMMERCIAL
POTENTIAL OF SHALE GAS ACREAGE IN THE
NAPPAMERRRI TROUGH**

Shale Gas Conference – 23 August 2011

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Introduction

1. The Nappamerri Trough
2. Gas markets
3. Maximising commercial potential
4. A related opportunity – in gas storage

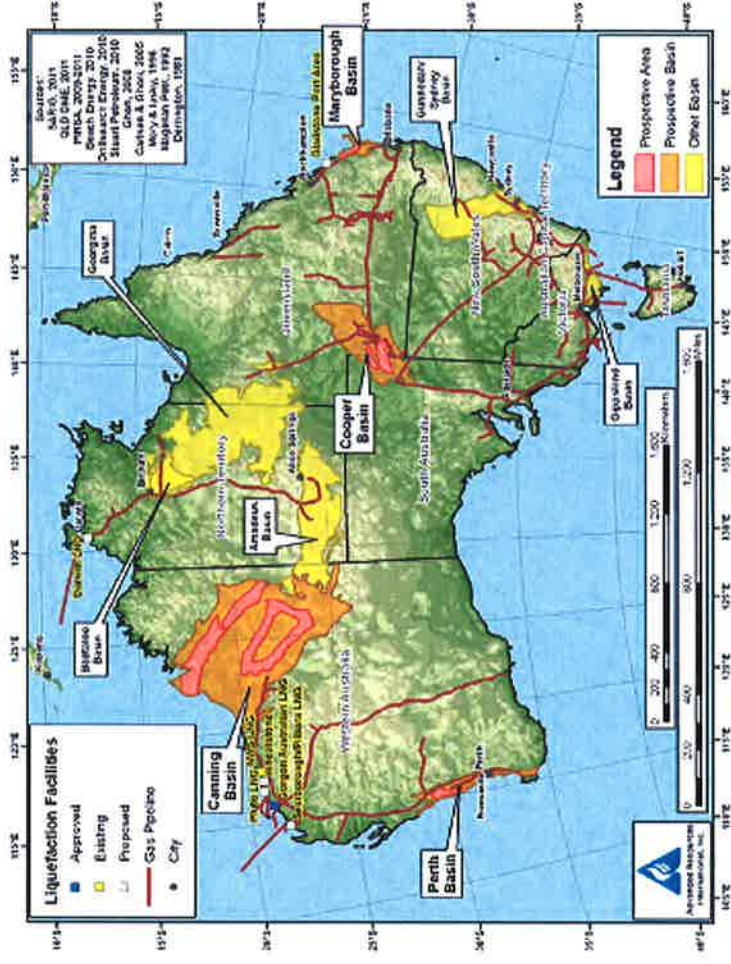


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Shale gas in Australia

- ❑ Shale gas exploration in Australia is underway
- ❑ The Nappamerri Trough is the most advanced (and arguably best located) – but there are a number of other plays
- ❑ IOCs and Majors have started taking positions
- ❑ Australia has the potential to be the No. 2 shale gas area in the world (geology, geography, politics, population density, etc)



Source - EIA



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The problems with shale gas in Australia

It isn't there...

- Rebutted by recent 2 Tcf 2C booking by ADE and BPT

The local gas market is too small...

- Massive liquids deficit
- Wheels can be moved by gas instead
- Realistic carbon solution = gas instead of coal
- Export

It costs too much to produce...

- Haynesville costs (BG) - \$3.2/mmbtu
- Cheap conventional gas - going/gone
- Cheap CBM – going to Asia

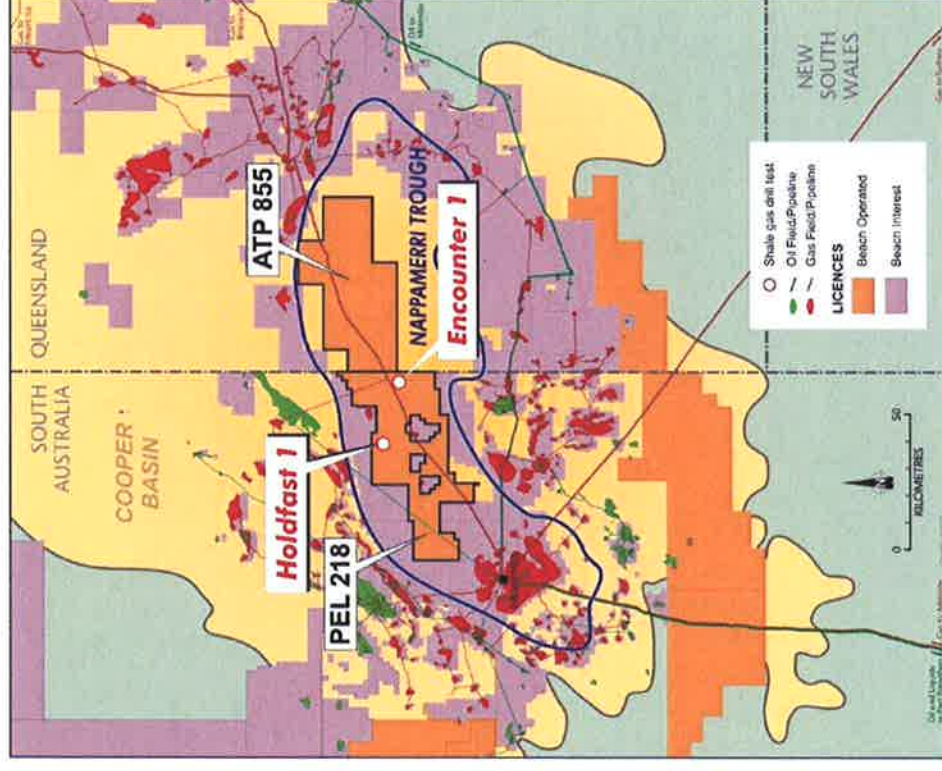


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The Nappamerri Trough

- ❑ The Nappamerri Trough is at the forefront of shale gas exploration in Australia
- ❑ Geologically, this area has very thick and carbon rich shales/tight sands – gas presence established through earlier drilling
- ❑ A 2 well program in PEL 218 Permian (BPT and ADE) has led to an initial contingent resource booking of 2 Tcf
- ❑ Significant upside exists beyond this initial number



Map source: BPT

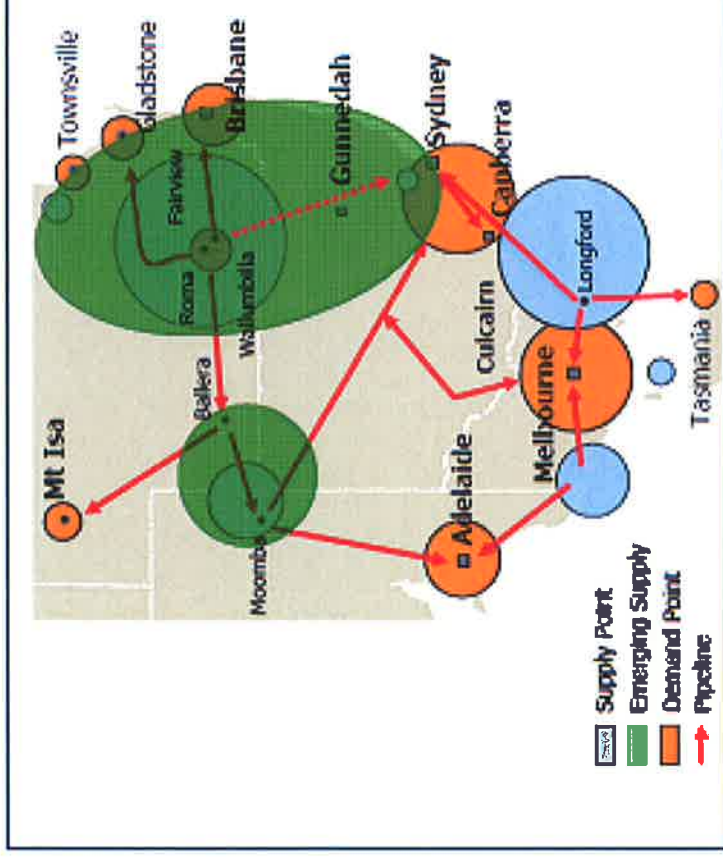


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The Nappamerri Trough's Advantages

- ❑ **Geology** – 2C resource booking
- ❑ **Domgas market access** – at heart of Eastern Australian pipeline system
- ❑ **International market access** – Cooper gas already contracted for export
- ❑ **Infrastructure** – existing gas plants
- ❑ **Acceptance** – 60 years of oil and gas exploration/production
- ❑ **Politics** – desert/scrub with extremely low population density



Source - STO



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Shale gas in Australia – Markets

- ❑ **Current gas market:**
 - Base demand growing at ~ GDP (presently ~700 PJ per annum)
 - Depletion of conventional gas supplies (only Gippsland JV has material uncontracted reserves)
 - CBM reserves largely committed to export markets – and LNG exporters are short gas to fill planned trains
- ❑ **Future gas market possibilities:**
 - Australia's growing liquids deficit – 5 PJe per day by 2015 – massive potential new demand if gas substitution occurs
 - Low quality coal in SA/Vic – 2 PJe per day – Australia's simplest carbon solution policy is to replace with gas



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Dynamic competitive analysis

- ❑ Some analysis has recently concluded that the cost of extracting shale gas in Australia is such that it will not be competitive in the local gas market
- ❑ However, that is a static rather than dynamic perspective, and as such has little real world application
- ❑ Current East Coast gas prices (~\$4+) were set by the historical costs of conventional gas supply
- ❑ However, such supplies are rapidly depleting whilst demand is increasing (potentially exponentially if material coal and oil replacement occurs)
- ❑ The new price setter will not be conventional gas – but the cost of the new marginal gas supply – unconventional gas of some type (*high cost* CBM, tight gas or shale gas)
- ❑ WA shows that historical gas prices can rapidly increase (from less than East Coast prices to close to oil parity) as demand has expanded whilst traditional supplies have declined
- ❑ The issue for Nappamerri shale/tight gas is therefore not its absolute cost, but where it sits on the supply stack. The regional advantages noted above position it favourably

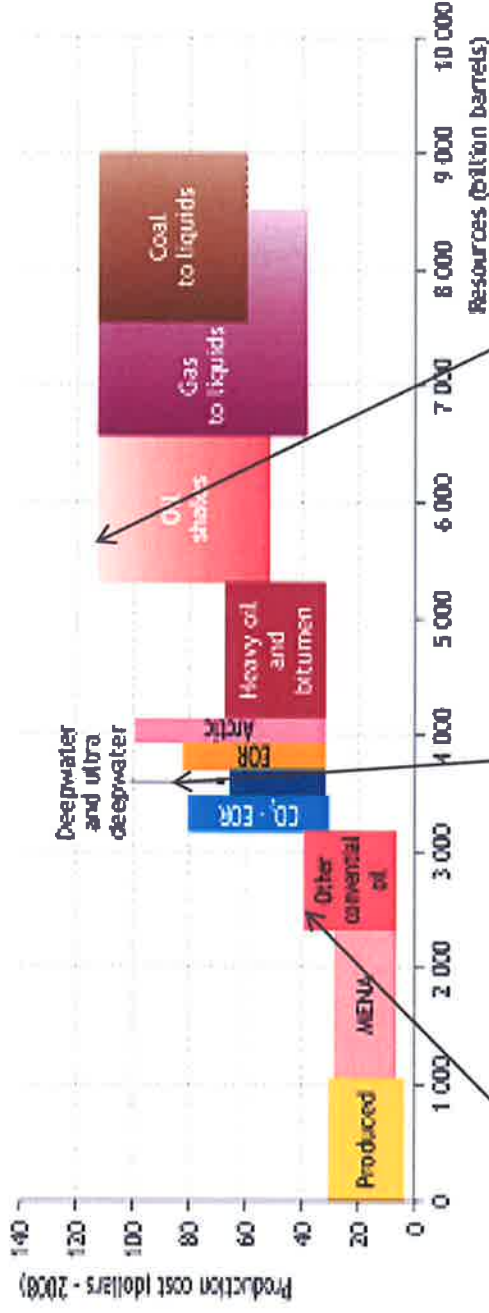


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Dynamic price analysis – oil price example

- The following EIA long term oil supply curve illustrates the dynamic analysis point:

Figure 9.10 • Long-term oil-supply cost curve



Oil price used to be set at this point (in EA gas terms – where we are just now)

Cooper Shale Equivalent?

Oil price now set here (in EA gas terms where we will be post 2014)



Shale Gas in Australia – Lessons from CBM

- Very large resources are attractive to the deep – pocketed (but opportunity constrained) Super-Majors, large IOCs and NOCs
- Australia is (still) an attractive investment destination
- Asia is the world growth hub for the foreseeable future
- Unconventional gas can be exported
- Current domgas pricing is irrelevant to acreage values
- The service sector follows large resources – costs come down over time
- The most profitable role for local companies is to establish initial resources/reserves – let others develop and produce

Recent new entrants to on-shore Australia

Super-majors:

- **Shell**
- **Conoco-Phillips**
- **Total**

Large IOCs:

- **BG**

NOCs:

- **Petronas**
- **Petrochina**
- **CNOOC**
- **Kogas**



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Maximising Commercial Potential

- The lessons from CBM indicate that the optimal role of a small explorer is likely to be:
 - Obtain the acreage (*ADE has built a land position in the Nappamerri Trough*)
 - Fund exploration (*farm-out to BPT*)
 - Establish the resource (*an initial 2C booking has been made*)
 - Commence proving commerciality (*the next steps*)
 - Optimise its exit path (*Farm-out? Asset sale? Corporate transaction? Etc?*)
 - Recycle into the next play (*e.g. the Maryborough or Otway Basins*)
- The definition of a “small” explorer in the context of the high capital costs of large scale shale gas development could be a very wide one (US experience of asset and corporate sell-downs/outs)
- Partner alignment facilitates maximising value – ADE and BPT have recently strengthened their Nappamerri Trough alliance to this end



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What could the Napp Trough be worth?

- ❑ North American shale assets are often valued on a per acre basis
- ❑ Structural traps are not required – rather thick “blankets” of tight reservoir over large areas (as per CBM)
- ❑ Per acre metrics vary from Shale Basin to Basin, reflecting different levels of maturity, gas/condensate mix, pressure (and hence production rates), etc
- ❑ It is arguable that traditional reserves definitions have not caught up with commercial practice in North American Shale valuations and transactions (again, as for CBM)
- ❑ Typical deal prices have been US\$10k – 20k per acre

	PEL 218	ATP 855P	Total
Square kilometres	1,603	1,679	3,282
ADE share	10%	20%	
Net km2	160	336	486
Net acres	39,520	82,992	122,512
\$500/acre	\$20M	\$41M	\$61M
\$1k/acre	\$39M	\$83M	\$122M
\$5k/acre	\$198M	\$415M	\$613M
\$10k/acre	\$395M	\$829M	\$1.2B

Note: the above \$ figures are illustrative only

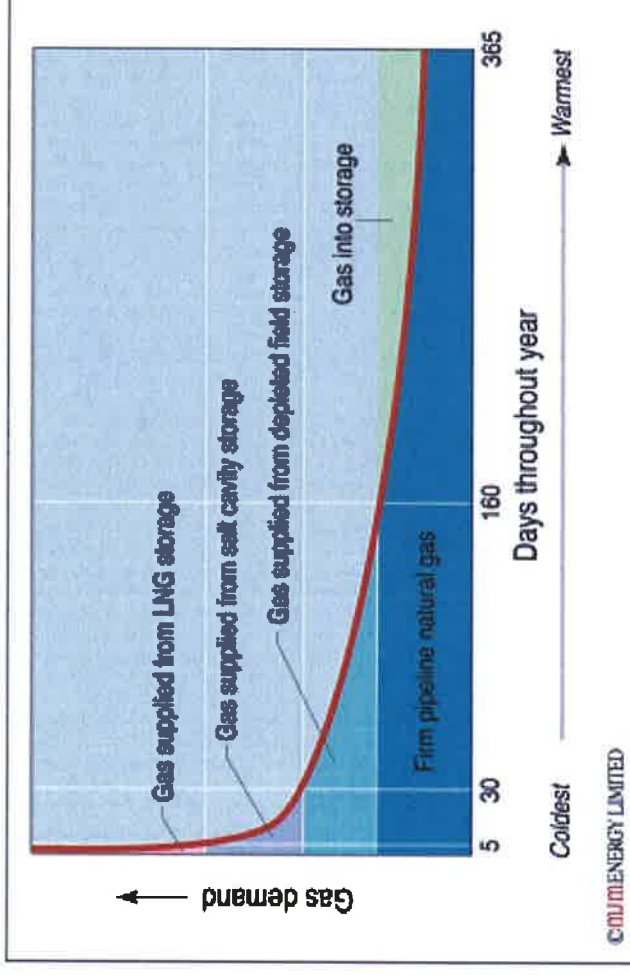


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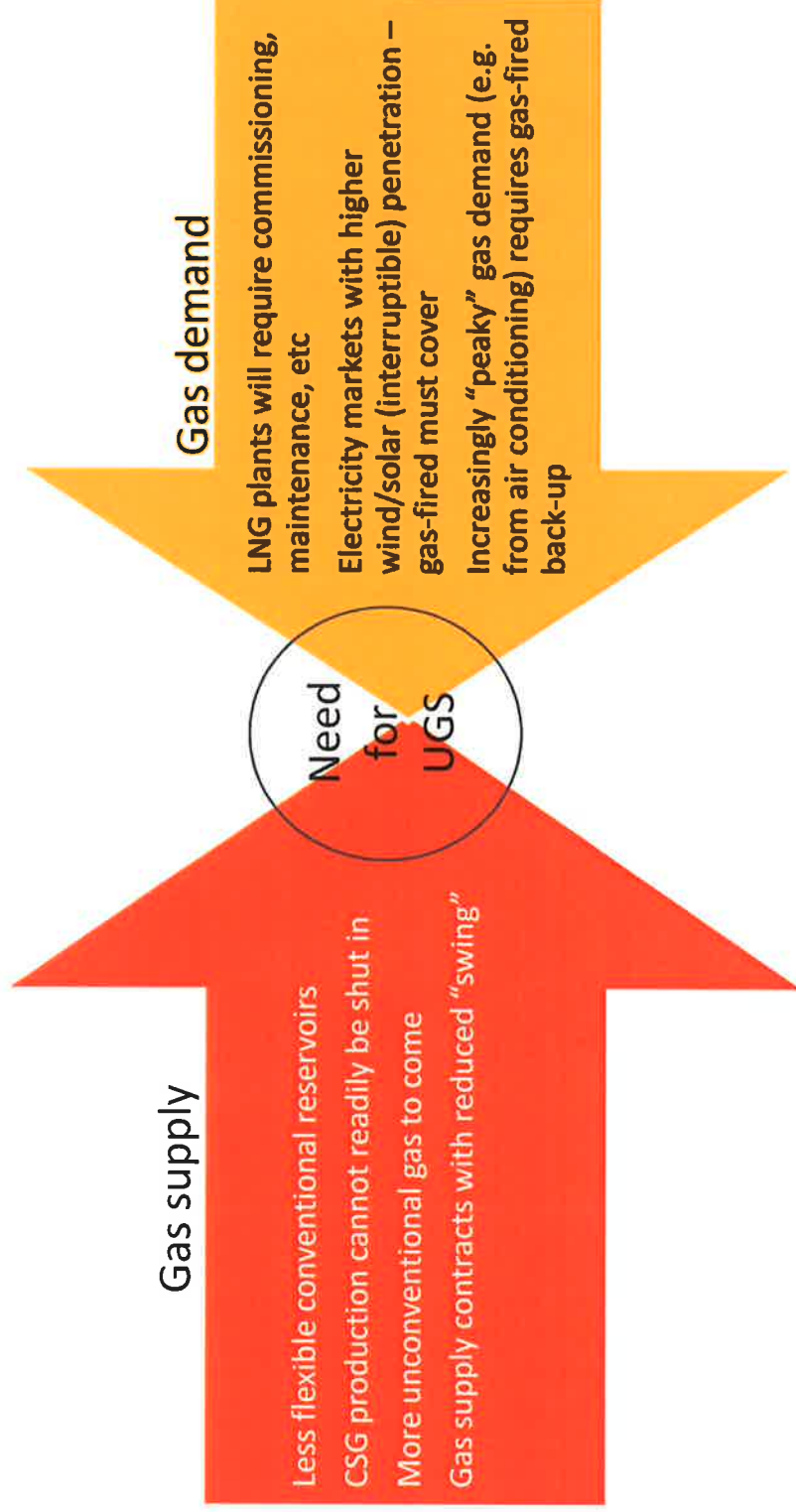
Shale Gas and Gas Storage

- An increasing share of Australian gas supplies must come from unconventional reservoirs (shales, coal seams and tight sandstones)
- Such reservoirs have inherent physical limitations over the flexibility of gas supplies
- At the same time, gas demand is becoming more variable
- The system must be balanced – and underground gas storage will play an increasing role in doing so





Changing market dynamics



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Some conclusions

- ❑ Australia is becoming increasingly recognised for its shale gas potential – it is well placed to become the 2nd largest producer after the US
- ❑ The Nappamerri Trough is the most advanced (and arguably best located) shale gas region in Australia
- ❑ Multiple large gas market opportunities exist for shale gas in Australia
- ❑ Dynamic market analysis indicates Cooper shale gas should have a profitable supply role
- ❑ Smaller companies may maximise their role in shale gas development in the earlier stages – and they have the key commercial challenge of managing their exit route
- ❑ The increasing role of unconventional gas in the supply mix means gas storage facilities will be required



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Questions?



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