

Unconventional Gas in Australia – Opportunities and Challenges

Shale Gas Summit

Shanghai 27 October 2010

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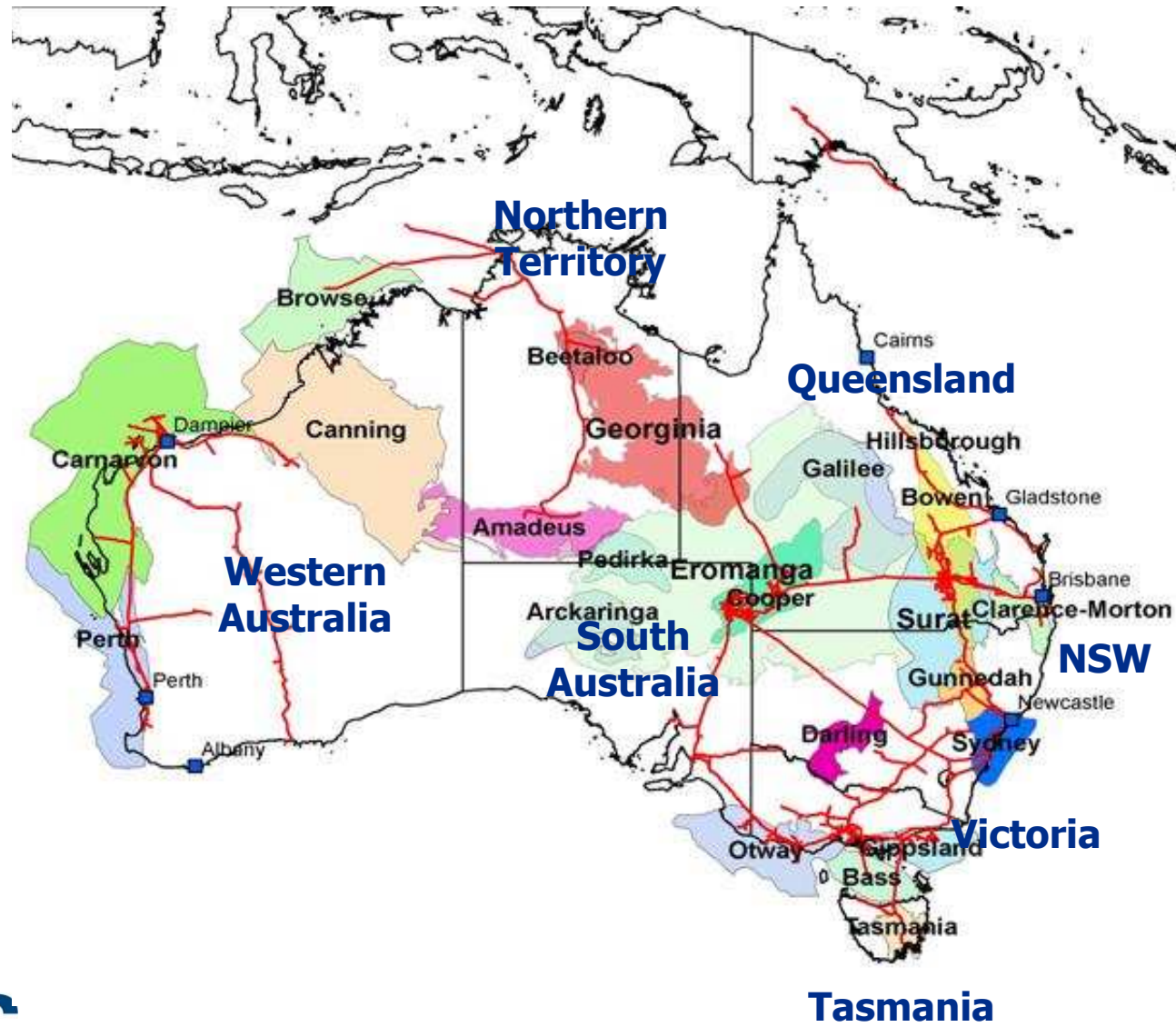
Unconventional Gas in Australia

The story so far....

- Gas supply in Eastern Australia has been transformed
- Unconventional gas is dominated by the CSG sector
 - US\$19 b of M&A transactions in the CSG sector alone since 2006 driven by world scale LNG export potential
 - LNG export contracts approximately \$200 b
 - Capital projects circa \$30b nearing approval
 - Production from zero to 150 bcf/a in 12 years
 - CSG represents 25% of total Eastern Australian domestic gas supply and will continue to grow
- Shale gas and Tight gas increasing in profile – what is the potential and what are the issues?

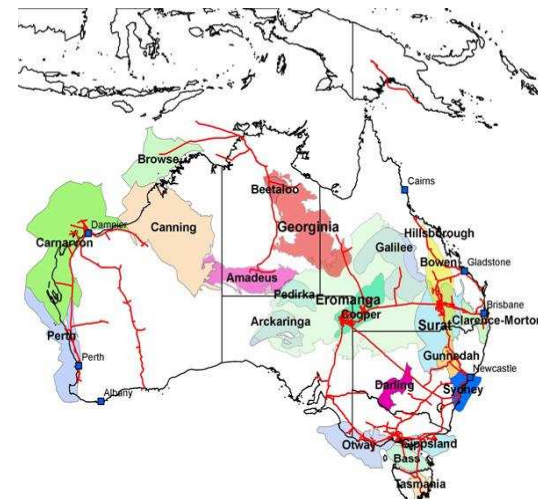


Australian Gas Market



Australian Gas Market – Eastern States

1. Eastern states domestic gas market
 - Higher population density, reasonable open access infrastructure, stronger competition
 - General oversupply
 - Typical price ex field US\$3.3/mcf in 2009
 - “Well head to wires” options ie local power generation supply to grid can yield higher value
 - NEM values US\$31-34/MWh in Queensland & NSW in 2008-9 increasing netbacks up to US\$6/mcf
 - Increased growth/prices if carbon reduction pricing scheme implemented driving gas powered electricity generation



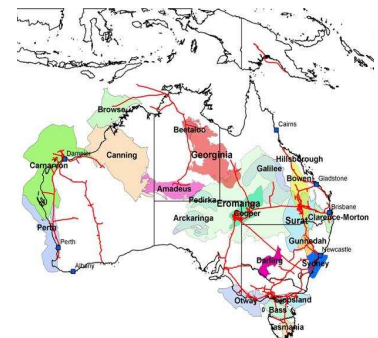
Australian Gas Market – WA and LNG Export

2. Western Australian domestic gas market

- Low population density, scarce infrastructure, limited competition
- Project driven market, high demand for gas
- Large industrial consumers (alumina, minerals processing, iron ore etc)
- High arbitrage opportunity for major producers – can sell as LNG or domestic gas
- Typical clearing price in excess of US\$6/mcf

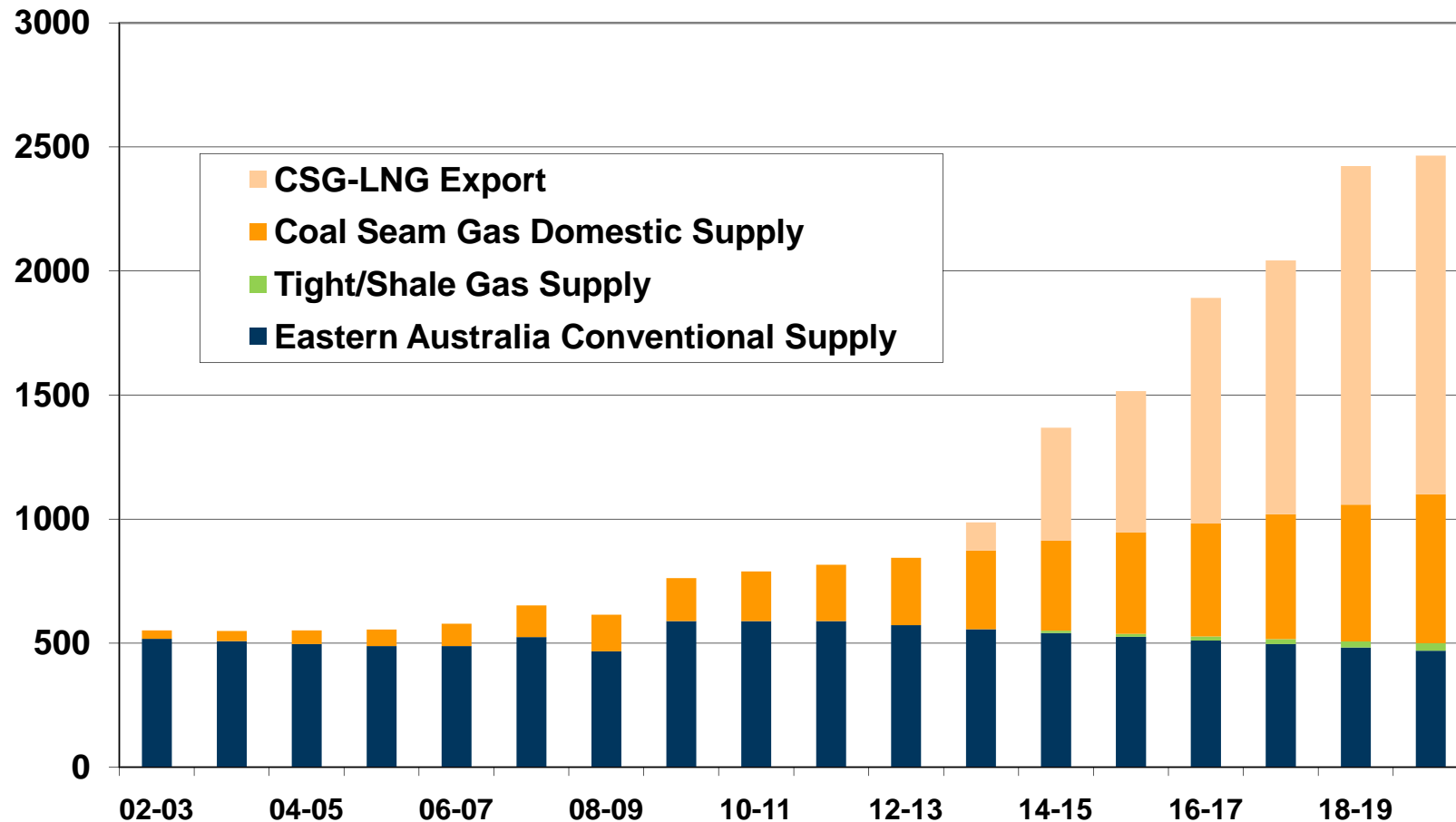
3. Export (LNG) Market

- Australia currently exports 16 Mtpa LNG from the NWS Gas project in Western Australia and the Bayu Undan project in Darwin
- Forecast to triple by 2020 (Pluto, Gorgon, Wheatstone, CSG-LNG and others)
- High netback prices driven by access to world markets

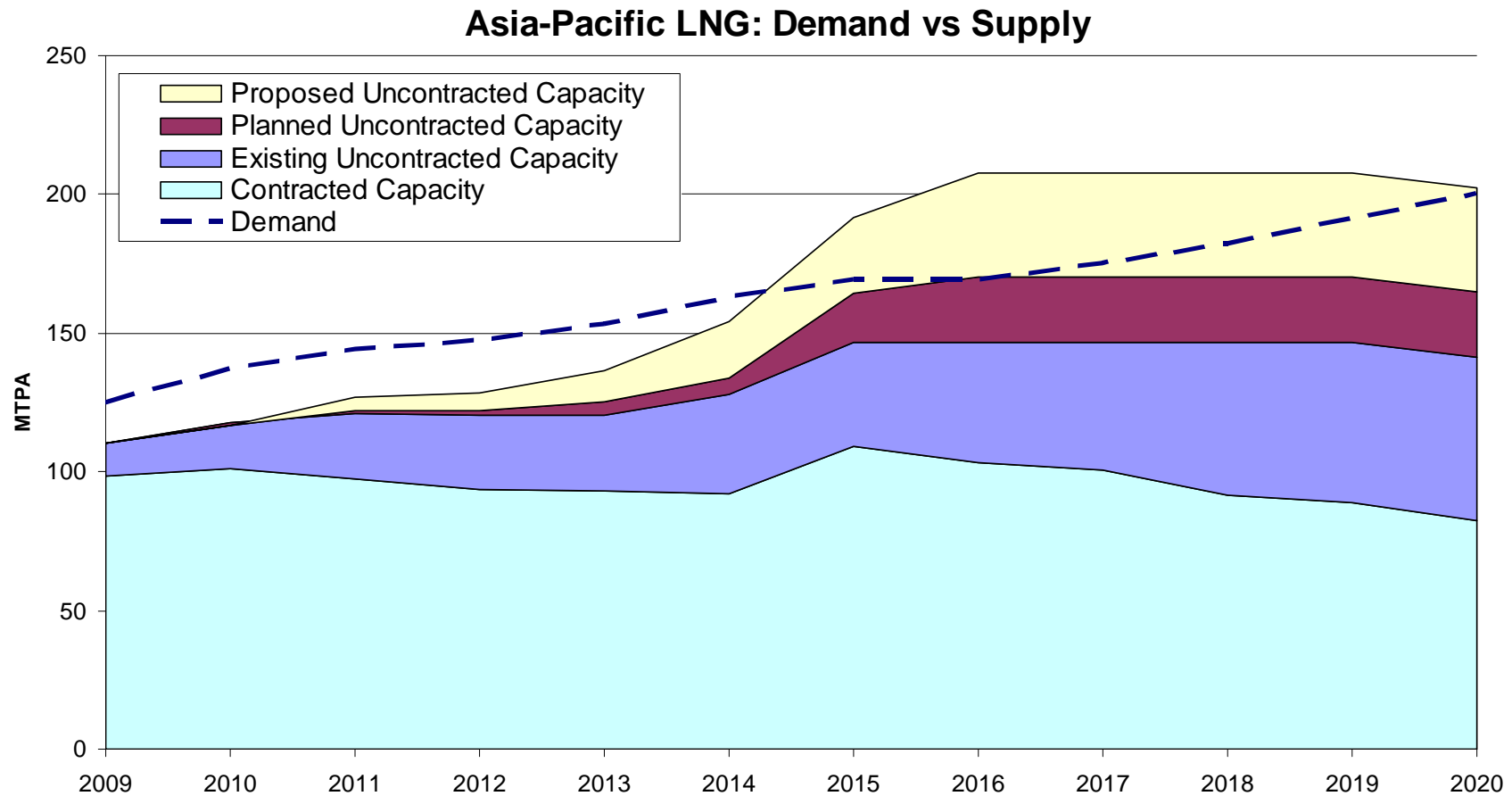


The CSG Industry has transformed Eastern Australian Gas Supply

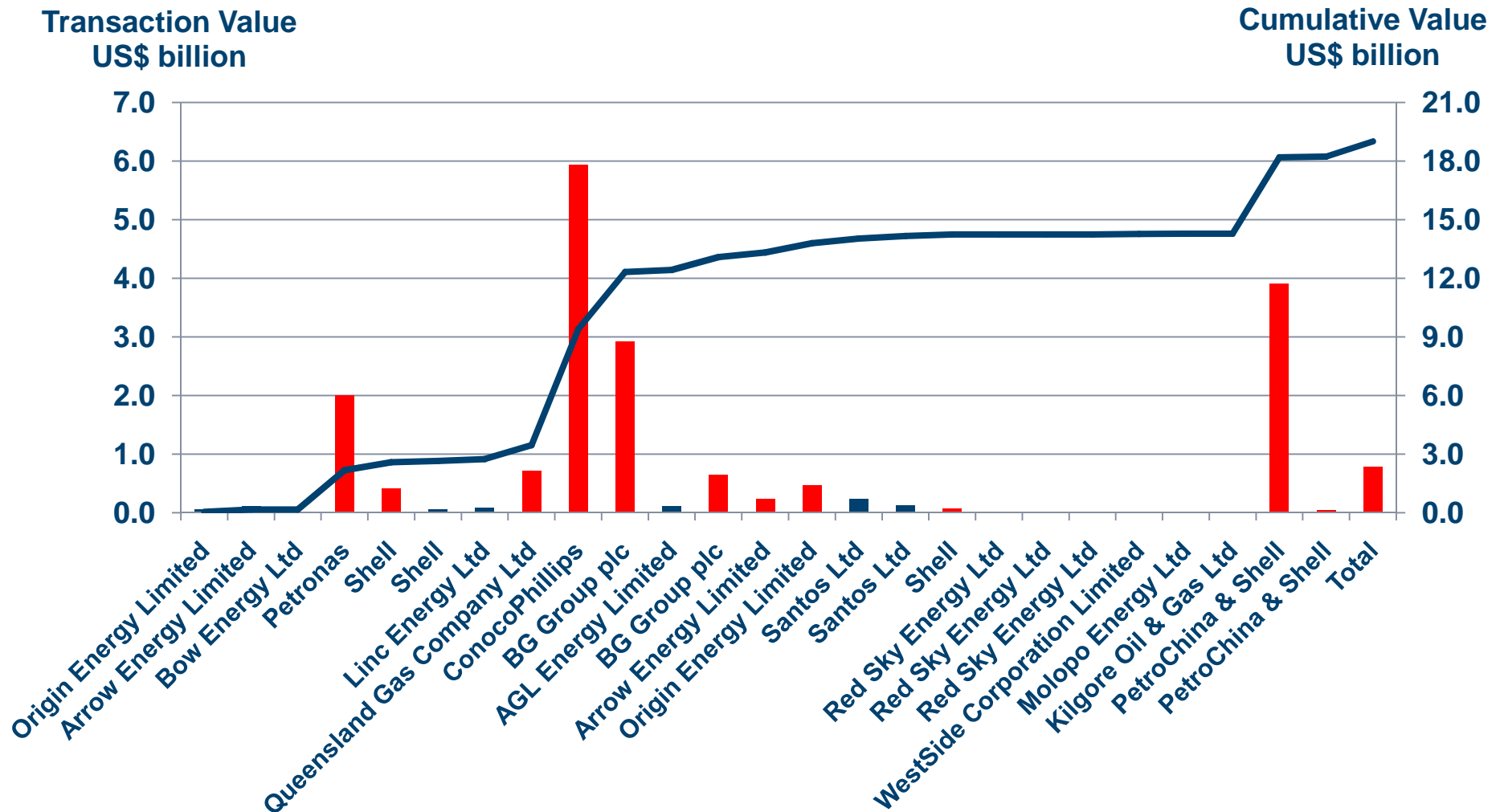
Gas Production PJ



Asia Pacific Demand and Supply



CSG M&A Value has been dominated by CSG-LNG Transactions



Source: JS Herold and RISC Analysis

RISC Report - Unconventional Gas in Australia 2010

- Non-exclusive report
- Status of the unconventional gas industry in Australia as at May 2010
- Covers Coal Seam Gas, Tight Gas and Shale Gas
- Approximately 200 pages
- Uses public domain data
- Supplemented by RISC analysis



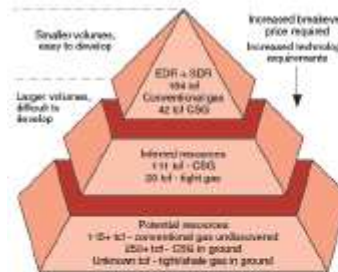
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Unconventional Gas in Australia 2010



RISC has applied extensive technical and commercial experience to compile an independent business focused assessment of the coal seam gas and emerging shale gas and tight gas industry in Australia.



The RISC report will include:

- Global context
- Key differences, critical success factors, resource maturation
- Australian unconventional gas industry:
 - coal seam gas - LNG Projects
 - fractured shale gas
 - tight gas
- Key players
- Prospective basins, existing and emerging plays
- Costs and economics of gas supply
- Regulatory and environmental issues

Available from May 2010 for A\$9,500 (exc GST).

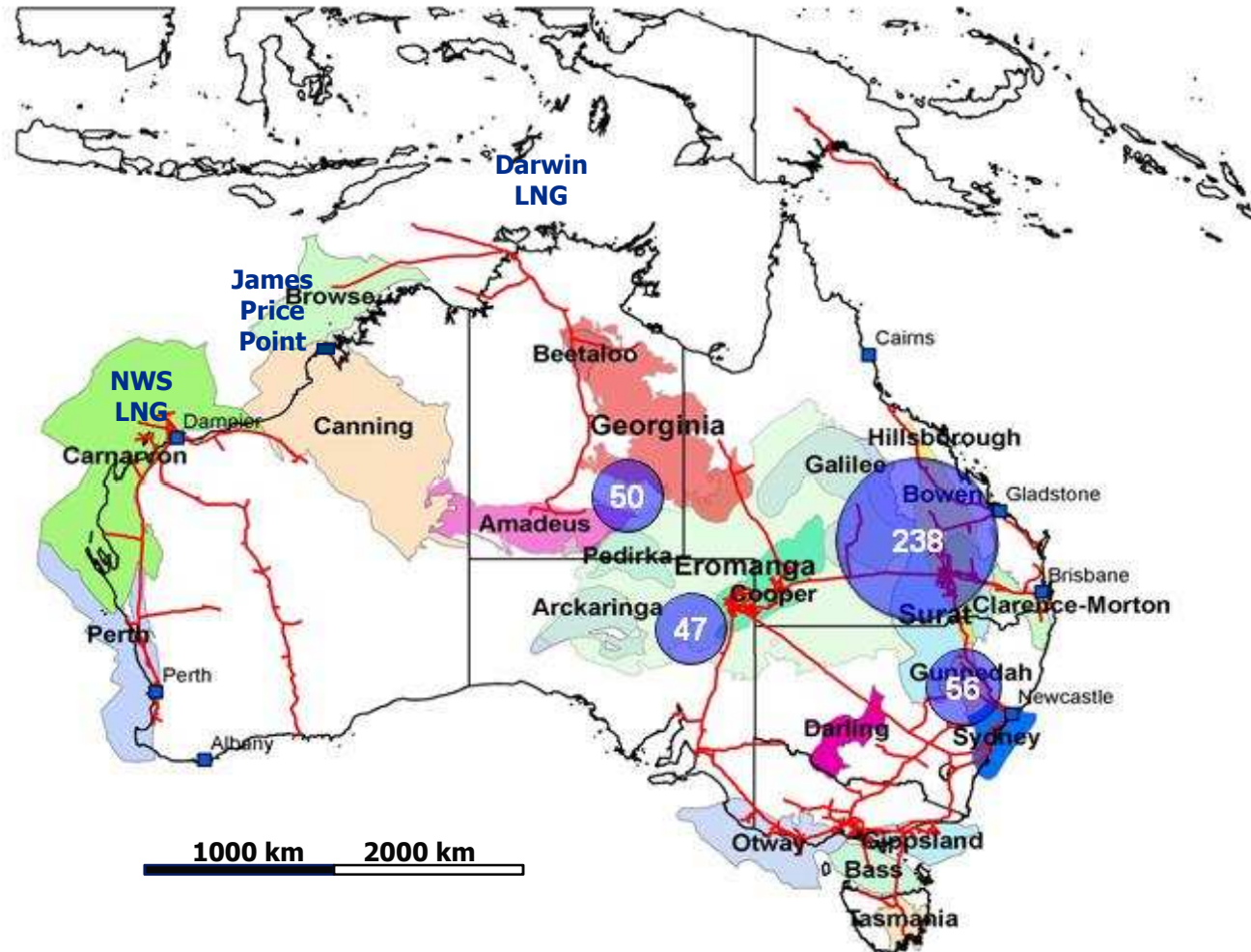
Also available in USD \$8,000, GBP £8,000 or EUR €8,750.

RISC is an internationally experienced Oil and Gas Consulting firm providing independent commercial and technical advice.

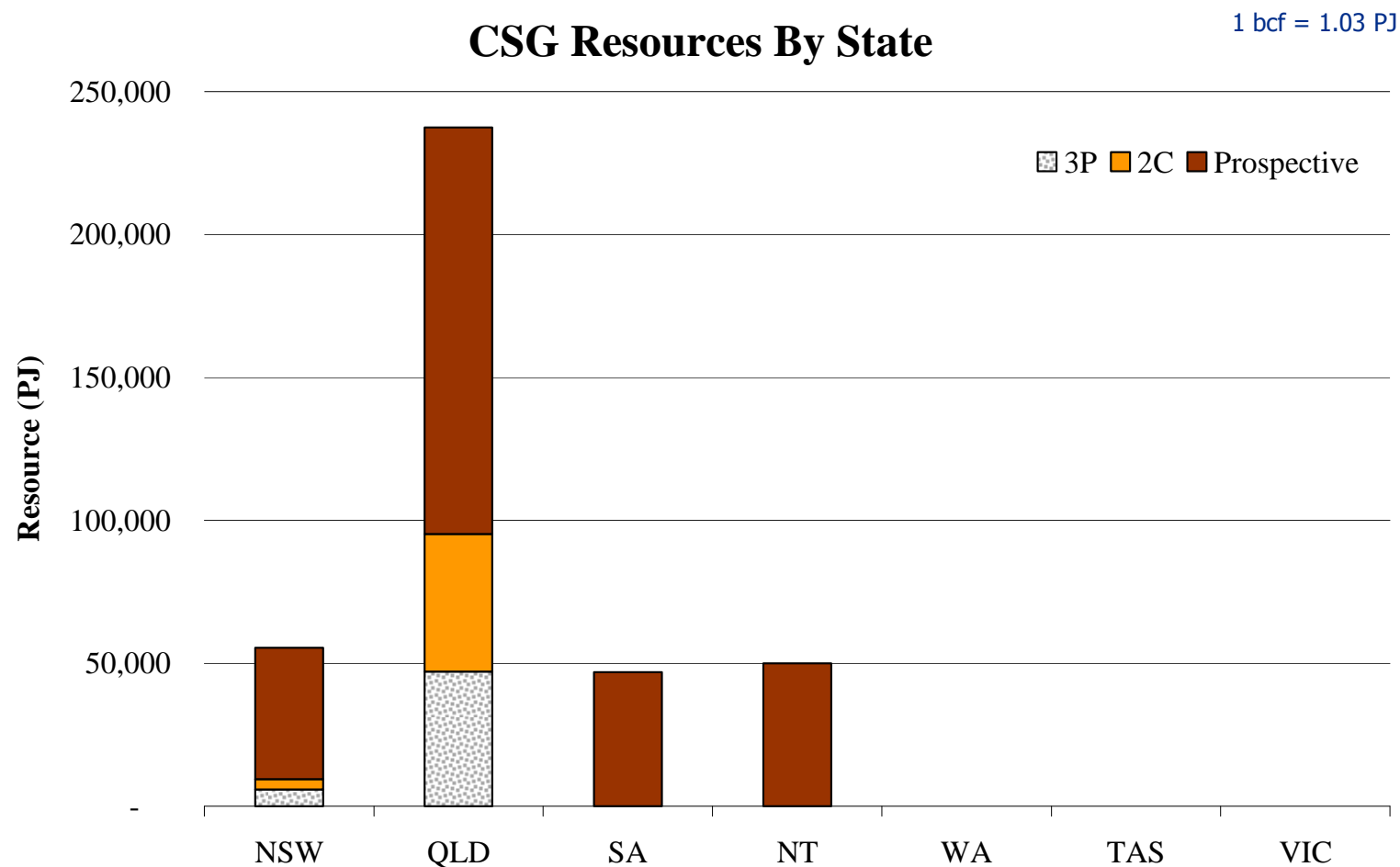
For further details please visit our website or to register interest, please contact: Robbie Swower +61 (0)8 9420 6660
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Coal Seam Gas Resource Unrisked Potential 390 Tcf - May 2010



Australian Coal Resources by State – May 2010

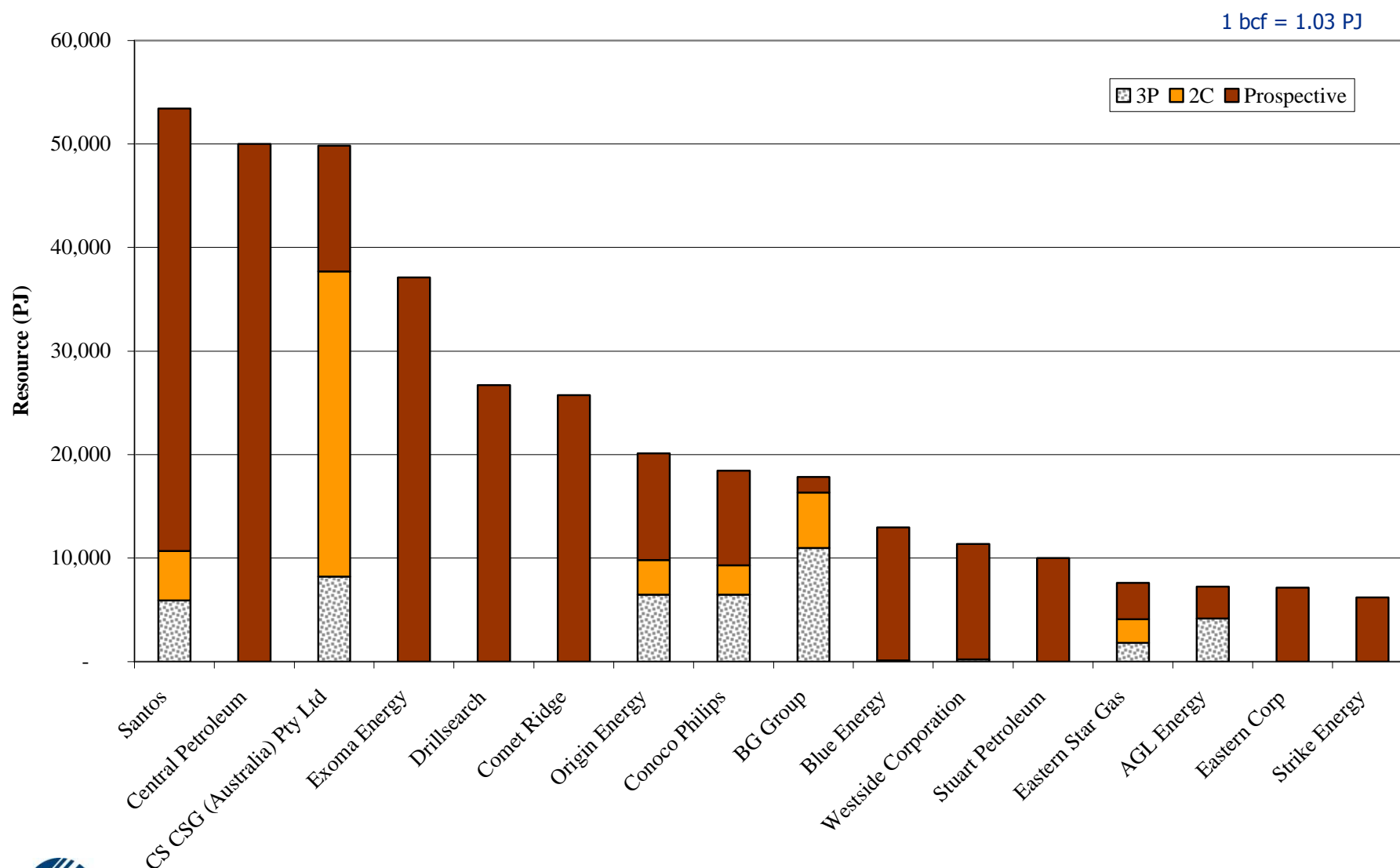


Source: Company websites and RISC analysis



Source: Unconventional Gas In Australia. May 2010 RISC

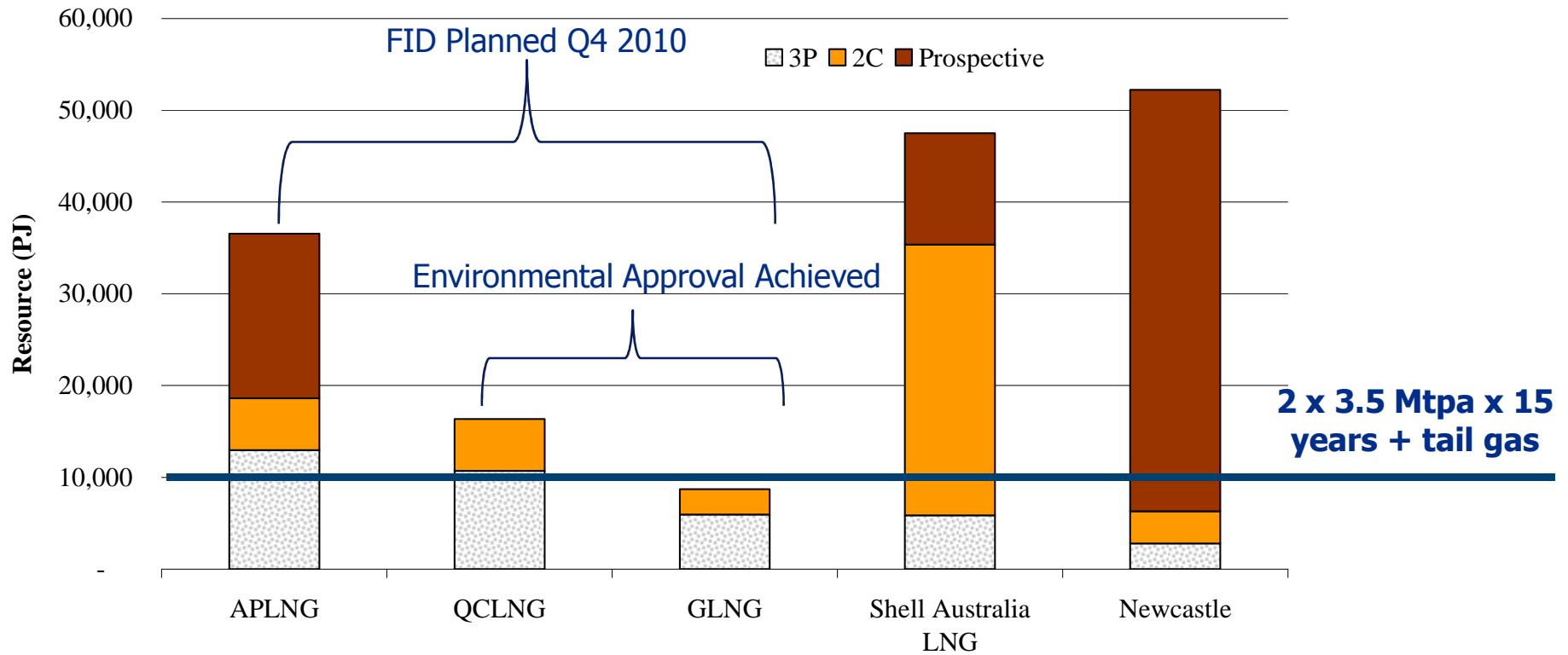
Coal Seam Gas Who's Who – May 2010



Note: Predates Santos/Petronas/Total Transaction

Source: Unconventional Gas In Australia. May 2010 RISC

Eastern Australian CSG – LNG Resources by Project Group - May 2010

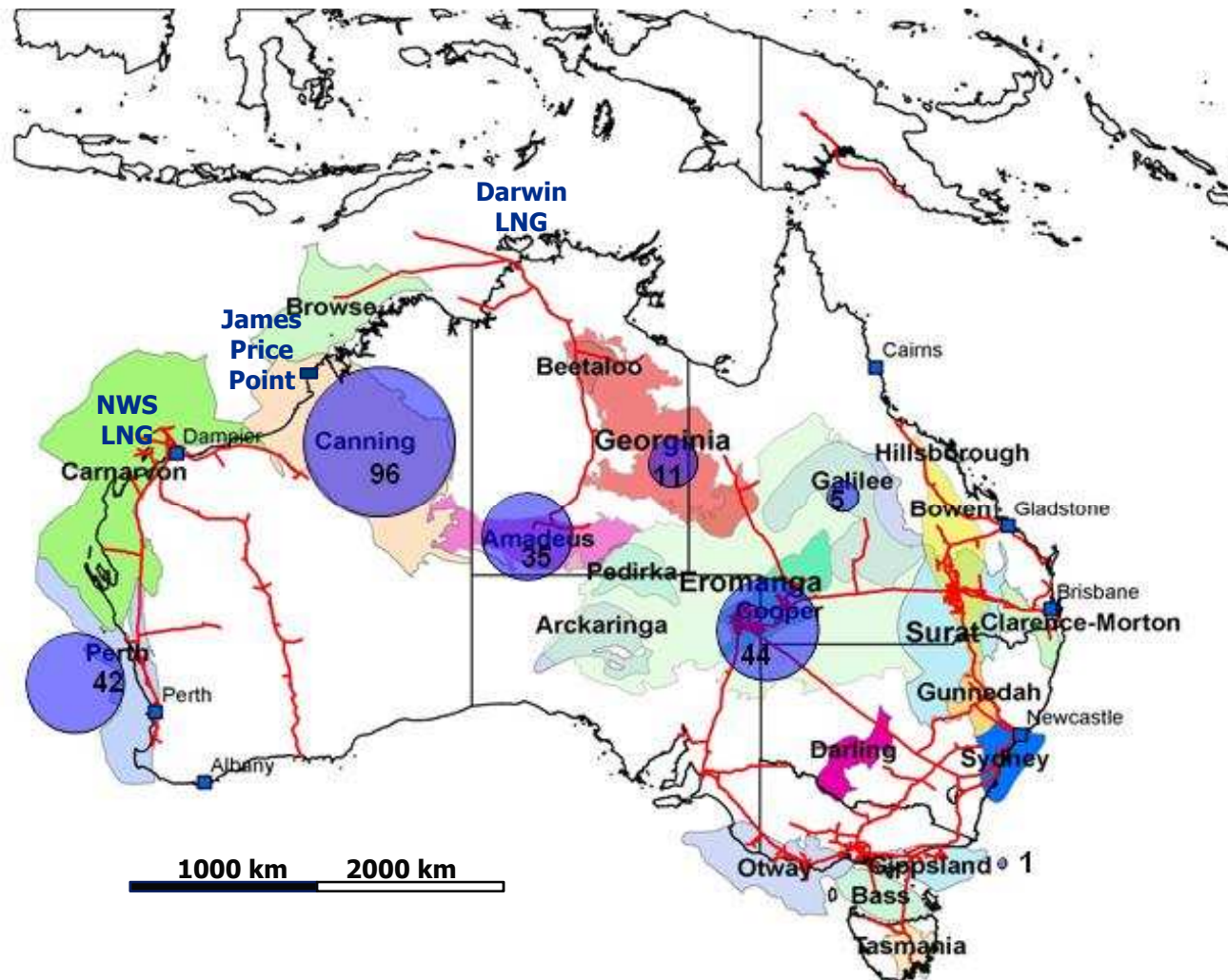


Includes domestic gas obligations



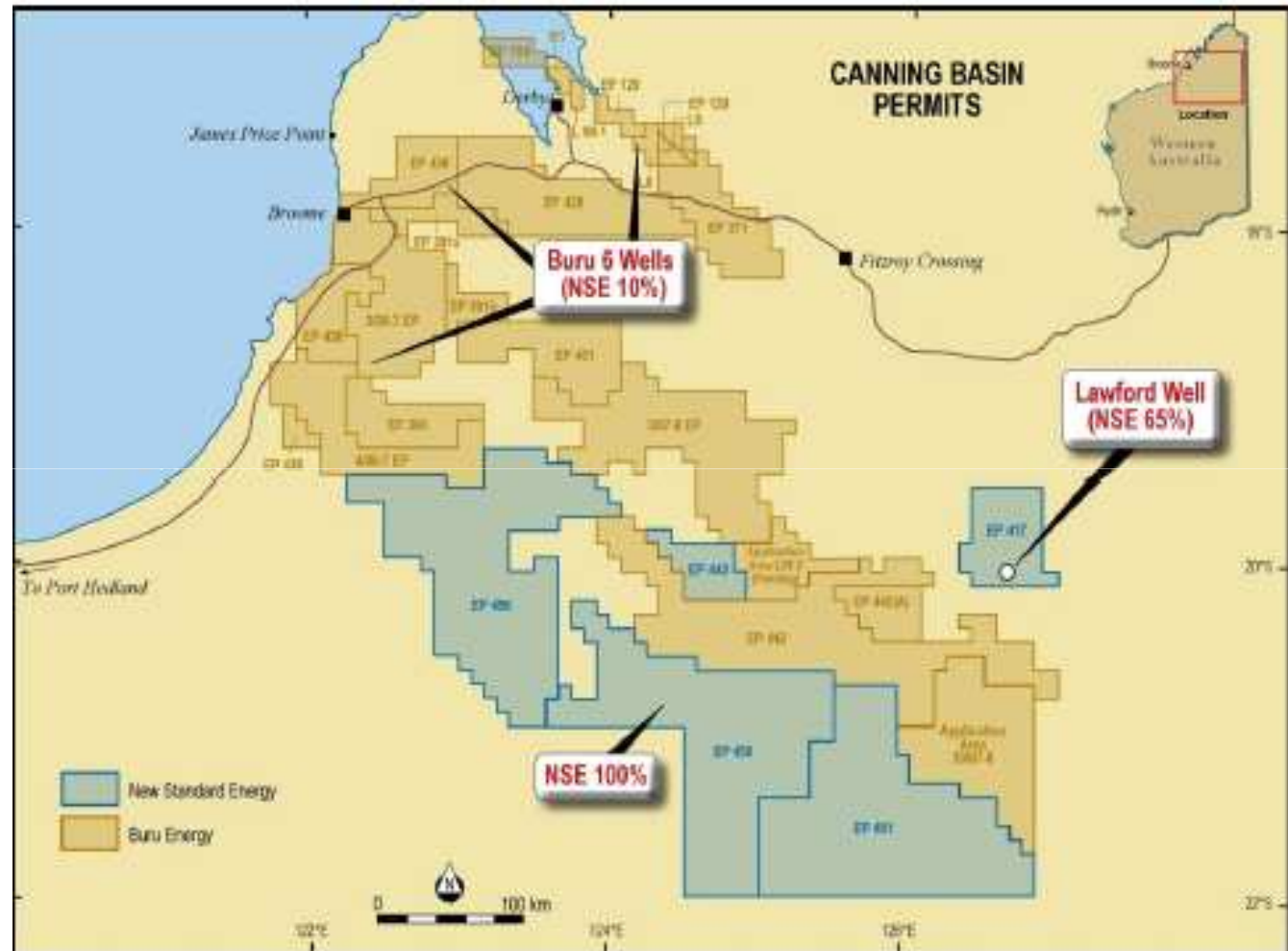
Source: Unconventional Gas In Australia. May 2010 RISC

Tight Gas and Shale Gas Resource Unrisked Potential 230 Tcf - May 2010



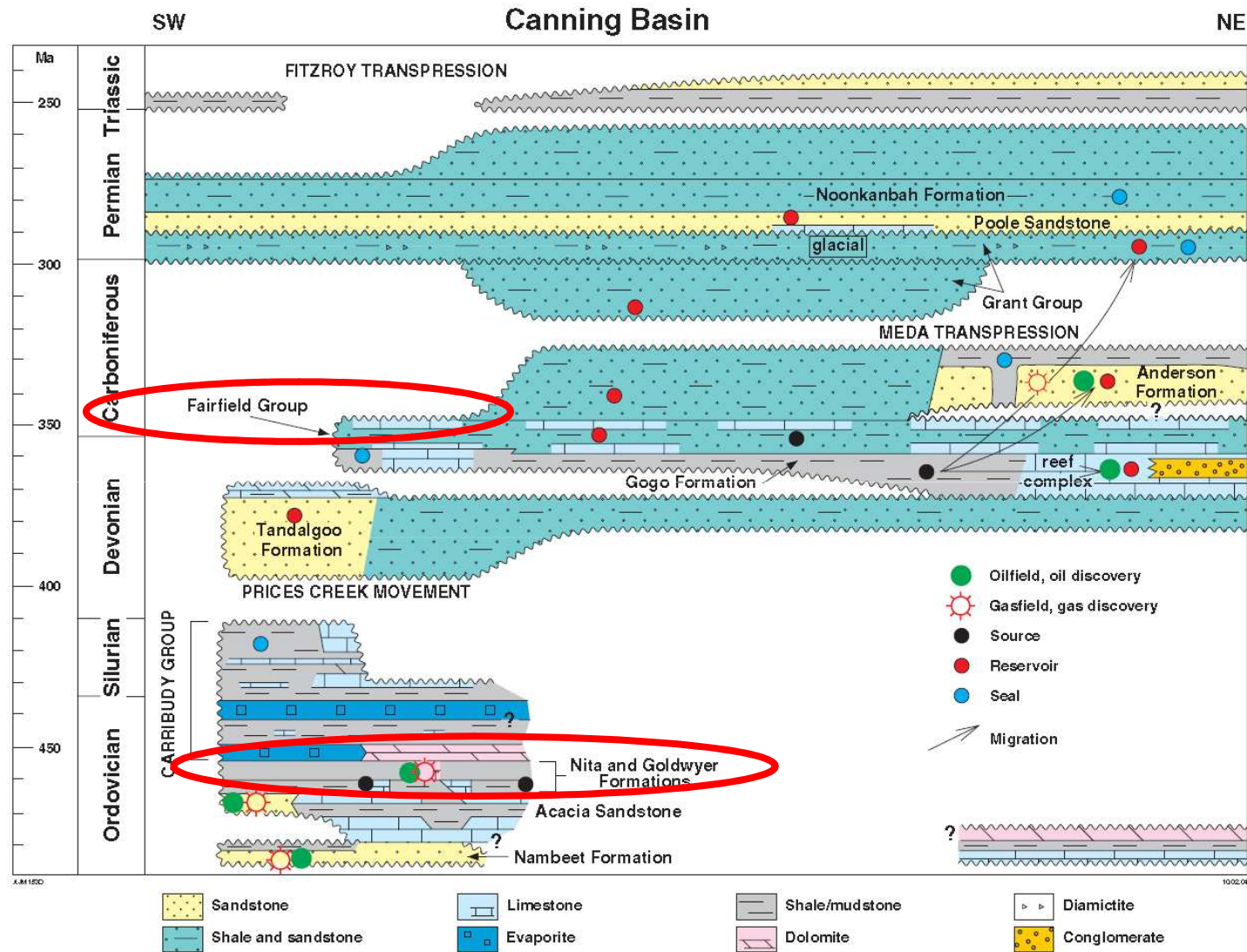
Canning Basin Example – Permit Map

- Basin has vast area :
Basin – almost 600,000 km² (148 million acres)
- Much of Canning Basin secured by Buru Energy and New Standard Energy
- Mitsubishi has farmed in to Buru's acreage (US\$90m deal, up to 50%)



Source: New Standard Energy website

Canning Basin – General Stratigraphy



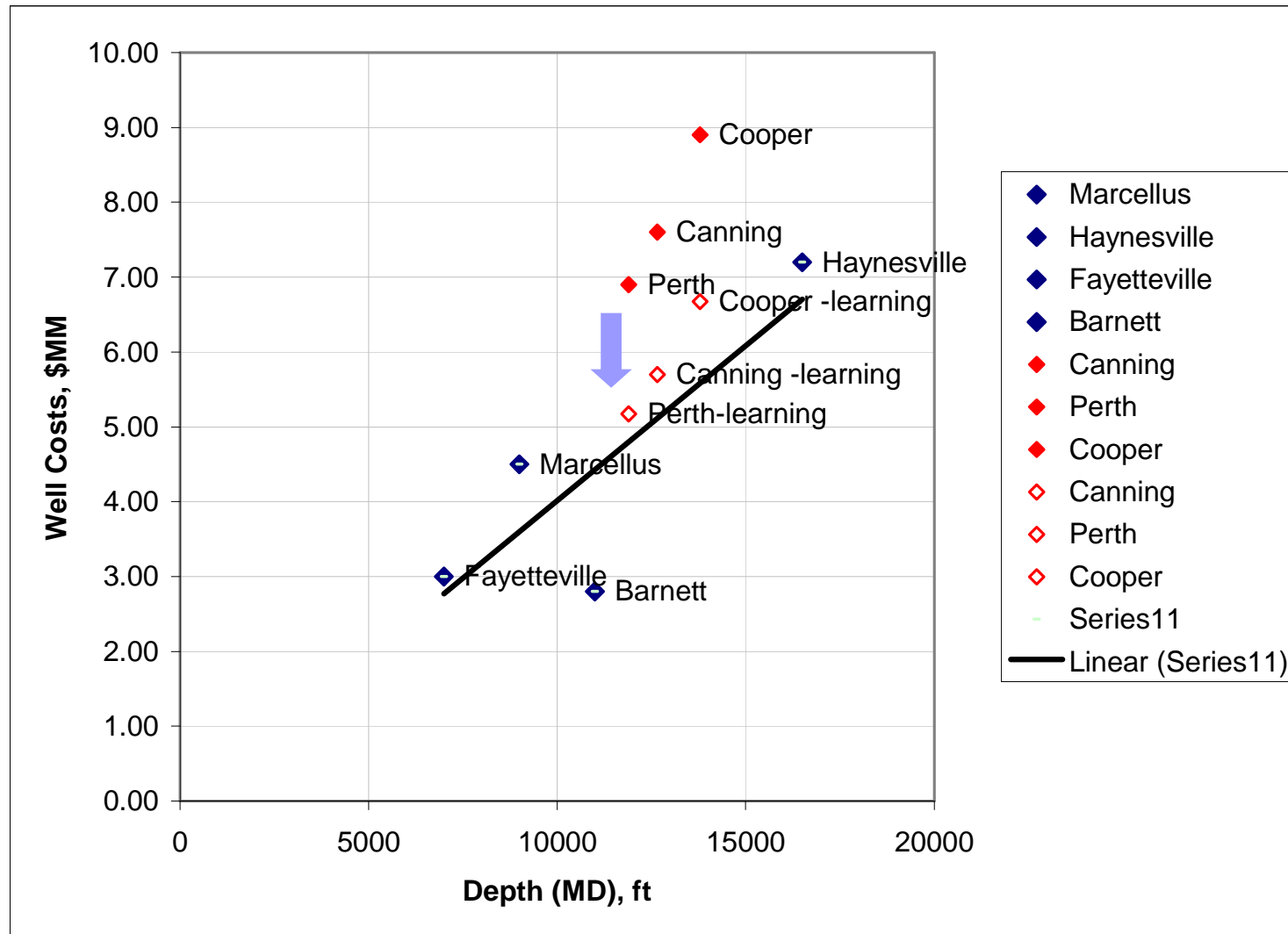
RISC Unconventional Gas Study – Typical Development Costs

- Currently tight gas / shale gas Australian cost structure almost 2 x US for comparable operations
- Learning curve assumed based on
 - economies of scale
 - increased competition etc
 - Development costs anticipated to remain higher than US even taking learning curve into account
- Projected development costs used in study:
 - Tight/Shale Gas US\$1.5-2.5/mcf
 - CSG US\$0.7-2.0/mcf
- Chesapeake in US quote average F&D costs of \$1.37/mcf



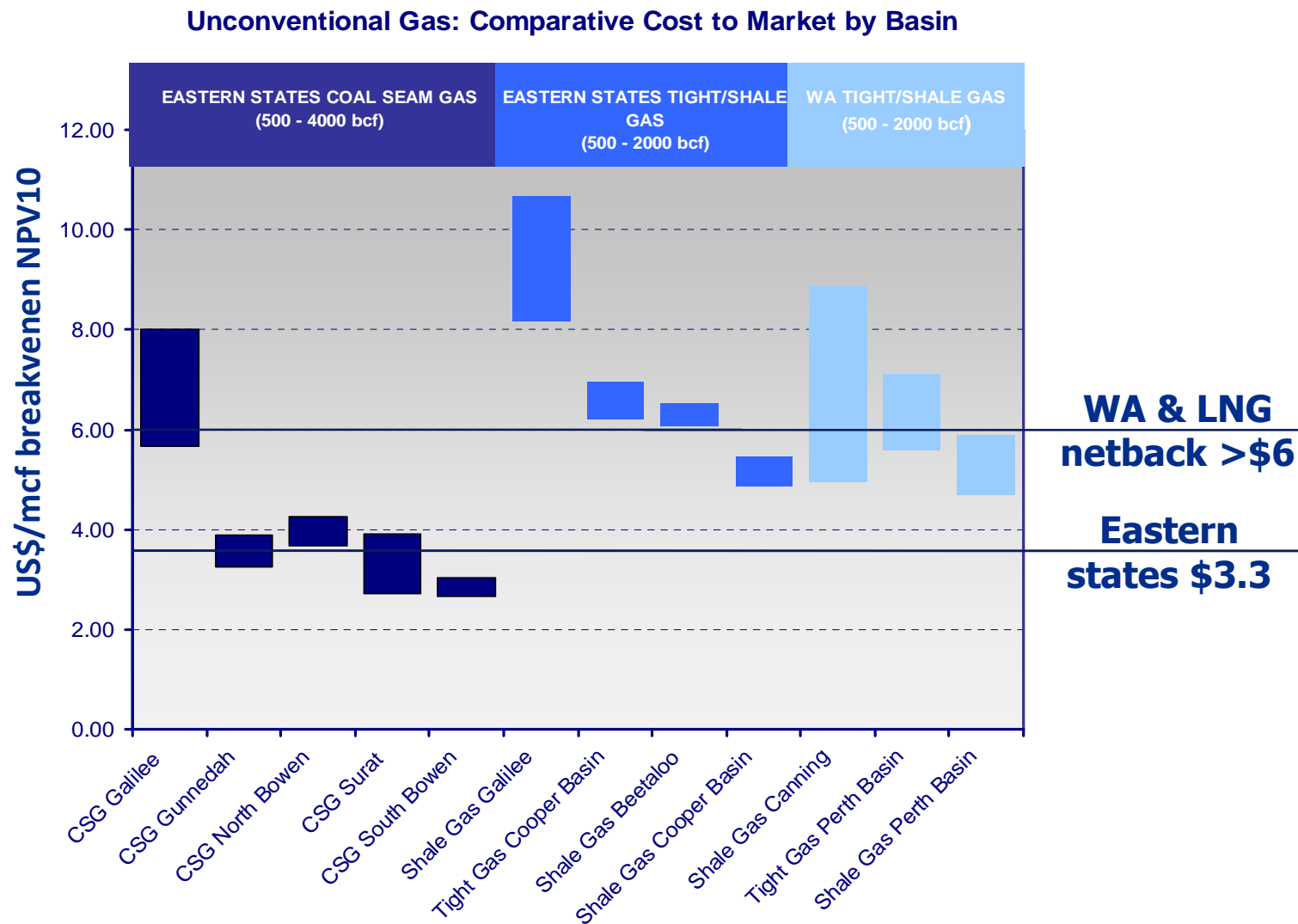
Source: Unconventional Gas In Australia. May 2010 RISC

RISC Unconventional Gas Study - Comparative Drilling Costs



RISC Unconventional Gas Study May 2010

NPV10 Comparative Breakeven Cost to Market



Source: Unconventional Gas In Australia. May 2010 RISC

Issues and Challenges – Coal Seam Gas

- Industry relatively mature in Queensland & NSW, but still large exploration component elsewhere
- Cost structures under control, but still higher than US
 - Limited access to hardware and services for smaller players
 - Remoteness and distances to markets increase costs
 - Expect a step change when CSG-LNG projects get going
- LNG-CSG, its never been done before, however the signs look good
 - Technology proven, scale unprecedented
 - Key milestone environmental approvals for 2 projects achieved
 - But - we don't know what we don't know
- Low domestic gas prices in Eastern States create challenges for non-export gas
- Environmental footprint
 - Community concerns “social licence to operate” yet to be achieved
 - Large numbers of wells
 - Water production and disposal
 - Significant conditions placed on environmental approval
- Tax !!!



Issues and Challenges – Shale Gas and Tight Gas

- Shale Gas is frontier exploration, concepts have yet to be proven!!!
- Tight gas is more mature, but still to be demonstrated commercially in significant quantities
- Cost structures at least 2 x US
 - Limited access to hardware and services (rigs, frac spreads, services, competition)
 - Remoteness and distances to markets increase costs
- Low domestic gas prices in Eastern States
- Higher prices in Western Australia and proximity to export infrastructure improve commerciality chances
- Fluid disposal / environmental management
- Tax !!!

Taxation changes - proposed

- Current Petroleum Resource Rent Tax (PRRT) is to be extended to all onshore and offshore oil, gas and coal seam methane projects (including the North West Shelf) – supplementing existing State Royalty.
- PRRT rate is to remain at 40%
- Credit for Royalties paid to State, Territory or Commonwealth Governments (unused balances compound at 7% p.a., but no transferability?).
- Start date of 1 July 2012
- Projects not previously under PRRT may elect for a 'market value' starting point.
- Company tax rate reduced to from 30% to 29% p.a. for 2013/14 income onwards.

Note:

- Australian constitution vests rights to all minerals and petroleum located onshore and in state waters to the States.
- Federal Govt. has no power to tax State minerals and petroleum, hence there may be a constitutional challenge.

**Thank You
Any Questions?**



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 - The average experience of a RISC professional is in excess of 25 years in the upstream oil and gas industry
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Long-recognised as the pre-eminent oil and gas consultancy in Asia, we are now an international consultancy of choice



Our expertise covers all elements of the upstream oil and gas industry value chain

	Exploration & Appraisal				Development				Production		Market		
	Seismic Interpretation	Exploration & Drilling	Reserves Certification	Conventional / Alternative Resources	Concept Selection	Brown/Greenfield Dev.	Onshore/Offshore/LNG		Project Execution	Reservoir/Production Management	Australian DomGas market	International Oil markets	Asia-Pac LNG supply/demand
Geoscience and Geology	✓	✓	✓	✓	✓	✓			✓	✓			
Petroleum Engineering		✓	✓	✓	✓	✓	✓		✓	✓			
Facility Planning		✓	✓	✓	✓	✓	✓		✓	✓			
Commercial		✓	✓		✓	✓	✓		✓	✓	✓	✓	✓



A selection of our mandates include..



Independent valuation of Venture in response to the takeover from Centrica

£2 billion



Technical and Commercial evaluation for acquisition of Repsol's interests in Jambi Merang PSC Indonesia

Value undisclosed



Independent Technical Specialist's Report on Hardman's global portfolio in response to Tullow's takeover offer

~ A\$900 million



Technical and economic valuation support to IPIC in relation to acquiring an interest in a major upstream oil and gas and proposed LNG project

US\$1 billion



Advice to the Woodside Board pertaining to the merits of the Shell takeover offer (Australia)

~ A\$10 billion



Independent Technical Review Reports on ROC's West African, UK and China properties for renounceable rights issue

A\$219 million

A selection of our mandates include..



Technical and commercial due diligence services to CNOOC Gas and Power on acquisition of interests in QCLNG Project

Equity USD 270 million
Gas Contract A\$50 billion



Technical and commercial due diligence services to CNOOC International on acquisition of interests in Tangguh and NWS LNG Projects

US\$623 million



PEARL ENERGY LIMITED

Independent Technical Consultants report on the takeover offer by Abbar for Pearl Energy Ltd

S\$864 million



Technical and commercial due diligence services to Kogas for acquisition of interests in Blue Energy

A\$12.7 million



Independent technical advisor to CSFB on loan facility to fund projects in the Kangean PSC, Indonesia

US\$275 million



GOVERNMENT OF
WESTERN AUSTRALIA

Review of Environmental, Social and Economic factors of Gorgon LNG project proposal on behalf of the Western Australian Government.

A selection of our mandates include..



Independent Technical Specialists
Report for Part B Target Statement
regarding takeover by Arc Energy Ltd of
Adelphi, whose main assets were
Eagleford Shale unconventional gas
properties onshore US

2010

A\$71 million



OMV Australia Ltd. in respect of its
divestment of its interests in the Timor
Sea

2009

US\$10 million



Horizon Oil Ltd in respect of its
divestment of certain interests in PNG
to Talisman Energy Inc.

2009

US\$60 million



Lead advisor to Toyota Tsusho in
respect of its acquisition of a T/18P
interest

2009

Undisclosed



Lead financial, commercial and
technical advisor to PetroleumBRUNEI

2009

Undisclosed



Independent Technical Specialists for
IPO on the Australian Stock Exchange

2009

A\$9.8 million





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