

Valuing Acquisitions Using Risk and Uncertainty*

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Abstract

As exploration for oil and gas resources becomes increasingly difficult, companies are looking to unconventional resources to replace reserves and develop new sources of production. Small independent energy companies have been first movers in acquiring much of the acreage and resources but lack sufficient capital to develop at-scale projects. As the industry matures, mergers and acquisitions play an important role in the growth of companies. However, does the price paid per mboe of certified volume truly reflect the value assigned, considering the various levels of risk and uncertainty associated with these reserves and resources?

In Australia, there have been several CBM mergers and acquisitions in recent years, driven by the need to consolidate activities, reduce costs, add reserves to the books, and build enough materiality to export as LNG. The newspapers are rife with comments and assessments that “the analysts say that the offer of \$1.5Bn for 3P and 2C reserves of 2 TCF implies a value of \$0.75/mcf of gas, the offer is towards the high end of recent transactions...” But how are these valuations arrived at? Is the valuation consistent and comparable between acquisitions and is it mathematically correct?

The Petroleum Reserves and Resources Classification and Definitions state that, when discrete estimates are made for each category of reserves and resources, they should not be aggregated without due consideration of their associated risk. Unfortunately, the analysts seem to have dropped the concept of risk from the evaluation, adding in many cases 3P and 2C and, in some instances, Prospective volumes all together. Should they be aggregated? Are they actually the same? Not only do these volumes carry a level of technical risk, they also have associated commercial risk. We believe that it is not enough to use a consistent classification system that reflects only the range of uncertainty: the system must also account for the risk.

Valuing Acquisitions Using Risk and Uncertainty

**Glenn McMaster and Frances Morris-Jones
September, 2009**

Mr. Greg Martin, the Managing Director of AGL (Australia Gas Light Company, Australia's largest integrated renewable energy company), was quoted in The Australian Financial Review on Thursday 6 June 2001 as saying:

“No matter how good a coal seam methane project is, it is very hard to fund and to bank a project that is going to be based solely on coal seam methane gas”.

Eastern Australian Gas Prices Will Rise, Goldman JBWere Say

By Angela Macdonald-Smith

Bloomberg.com

Feb. 8 (Bloomberg) -- Eastern Australian natural gas prices will probably rise 'materially' next several years, resulting in increased margins and reserve upgrades for producers, Go Sachs JBWere Pty said.

'Eastern Australian gas demand could more than double in the next 10 years.' GORDON RAMSAY, UBS analyst

Upgrade lifts Metgasco's gas reserves to largest in NSW

One of the smaller exploration companies .. Metgasco .. has increased its gas reserves in the Clarence Moreton basin of north-east New South Wales .. giving it the largest gas reserve position in the state.

UK's BG makes hostile \$13.1 billion Origin bid

Tue Jun 24, 2008 3:14am EDT



REUTERS

UPDATE 1-Australia Origin rebuffs BG, seeks LNG partners

Mon Aug 10, 2008 7:34pm EDT



REUTERS

GAS BONANZA

Long the Cinderella of the energy sector, coal-seam gas has suddenly emerged as the hot industry every big global player wants to be in - and NSW is the next frontier of the great gas rush. JAMIE FREED reports

It's boom or bubble

The Petronas purchase of Santos assets has electrified the industry, write Ayesha deKretser and Paul Garvey.

Santos surges 9pc on hope of takeover bid



Queensland Gas offers \$900 million for Sunshine Gas

Matt Chambers | August 21, 2008

QUEENSLAND Gas Co has kicked off the long-awaited consolidation of Gladstone's swag of coal seam methane-to-LNG schemes, agreeing to buy Sunshine Gas in a deal worth up to \$900 million.

THE AUSTRALIAN

INTERNATIONAL
Herald Tribune

\$7.3 billion gas plant planned for Australia

By Fayen Wong
Reuters

Monday, February 4, 2008

Source: Metgasco 2008

Since 2006 there have been over \$17 Billion of Mergers and Acquisitions in Australia CSG

- “...Petronas' investment would value its share of Santos' 2P reserves at A\$4.91 per gigajoule (GJ), or A\$1.65 per GJ, if using the largest estimate of the coal seam gas reserves...”
- “...the offer values the target's 3P reserves at between 50 Australian cents and 70 cents a gigajoule...”
- “...On this basis the CSG 3P reserves benchmark is up to A\$1.88/GJ...”
- “...Origin Energy estimates a gross resource base of 42 trillion cubic feet (tcf) of coal bed methane, including 17 tcf of prospective resources, located in the Bowen and Surat basins in Queensland. Based on this total resource, the transaction value is \$0.38 per mcf...”
- “...Based on the resources for a four-train development plan (11.4TCF net), the transaction value is \$0.70 per mcf (net)...”

***Valuations based on:
2P, 3P, 3P + 2C, 3P + 2C + Prospective***

Uncertainty: Reflects the range in the outcome volumes, either deterministically or probabilistically

Risk: Is associated with the chance that the minimum volume fails for technical reasons (deliverability, thickness, gas content etc.) or commercial reasons (price, cost, market, etc.)

Risked Resources Example

Portfolio A (BCF)

400
500
300
800
700
600
200
400
800
1000

Total

5700

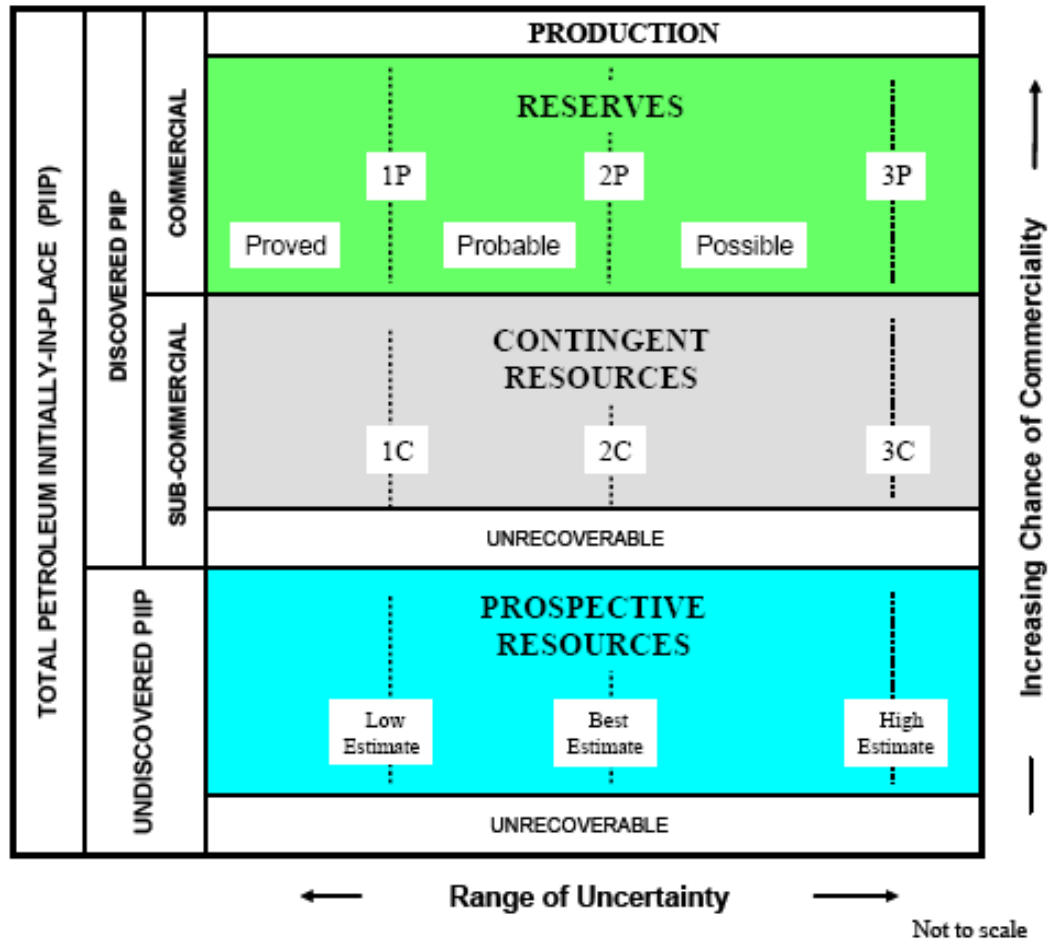
Risk (%)	Risked Portfolio
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60	240
50	250
60	180
30	240
40	280
80	480
80	160
20	80
40	320
20	200

2430

But What About the Risk!

- “The Petroleum Reserves and Resources Classification and Definitions state that when discrete estimates are made for each category of reserves and resources, that they should not be aggregated without due consideration of their associated risk...”

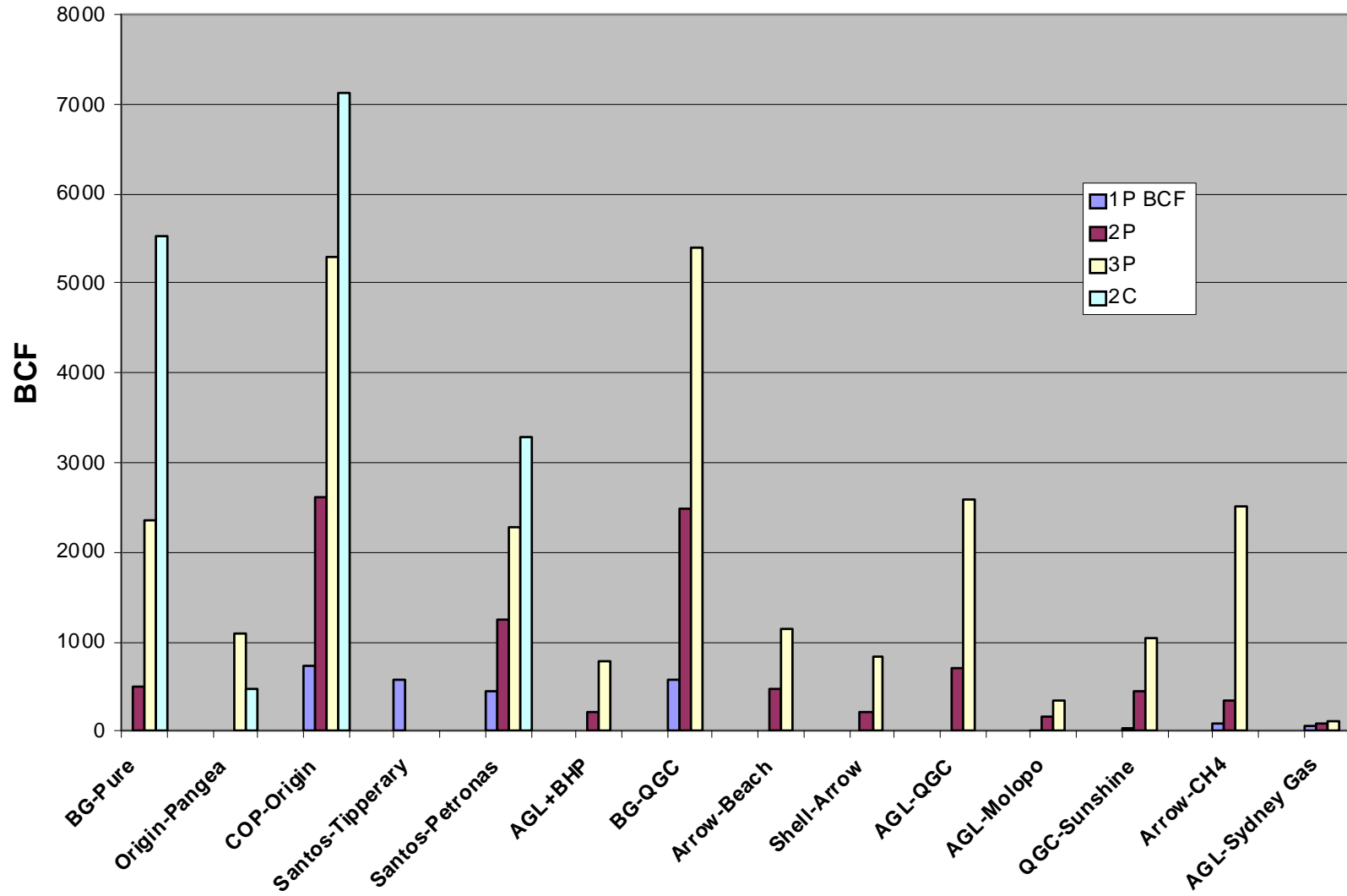


Australia CSG Deals 2006-2008

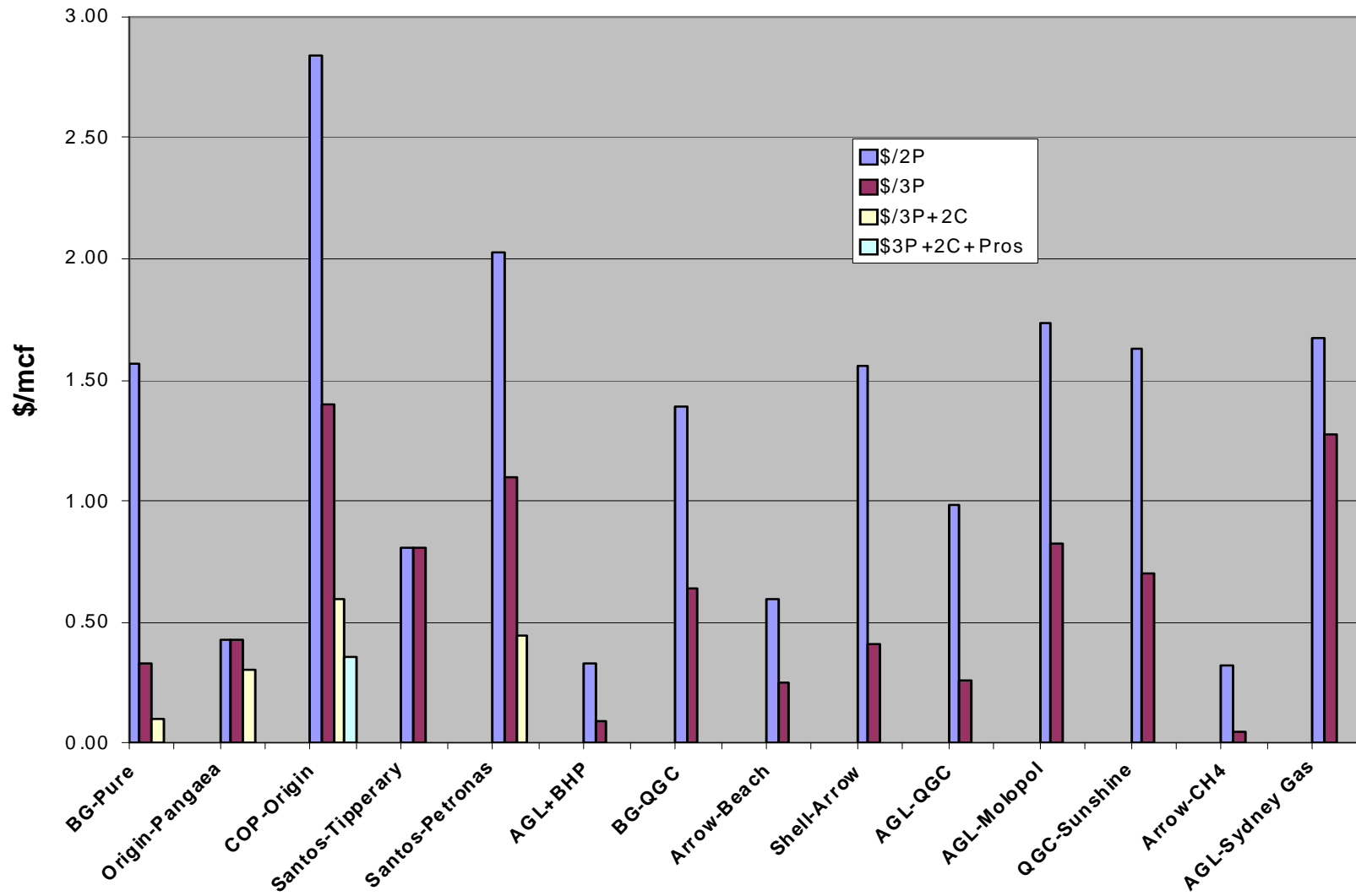
Deal	Date	Value \$MM	1P BCF	2P	3P	2C	Pros
BG-Pure	2009	770	0	492	2354	5520	
Origin-Pangea	2009	470	0	0	1100	471	
COP-Origin	2008	7,400	727	2610	5290	7126	8,500
Santos-Tipperary	2005	466	578				
Santos-Petronas	2008	2,500	444	1236	2285	3294	
AGL+BHP	2006	69		208	770		
BG-QGC	2008	3,442	580	2482	5394		
Arrow-Beach	2009	287		480	1152		
Shell-Arrow	2008	337		216	828		
AGL-QGC	2006	684		699	2600		
AGL-Molopo	2008	290	14	167	353		
QGC-Sunshine	2008	721	42	442	1035		
Arrow-CH4	2006	110	80	346	2506		
AGL-Sydney Gas	2009	134	57	80	105		

Data Source: Annual Reports, Analyst Presentations, Reserve Certification Documents, Company Websites

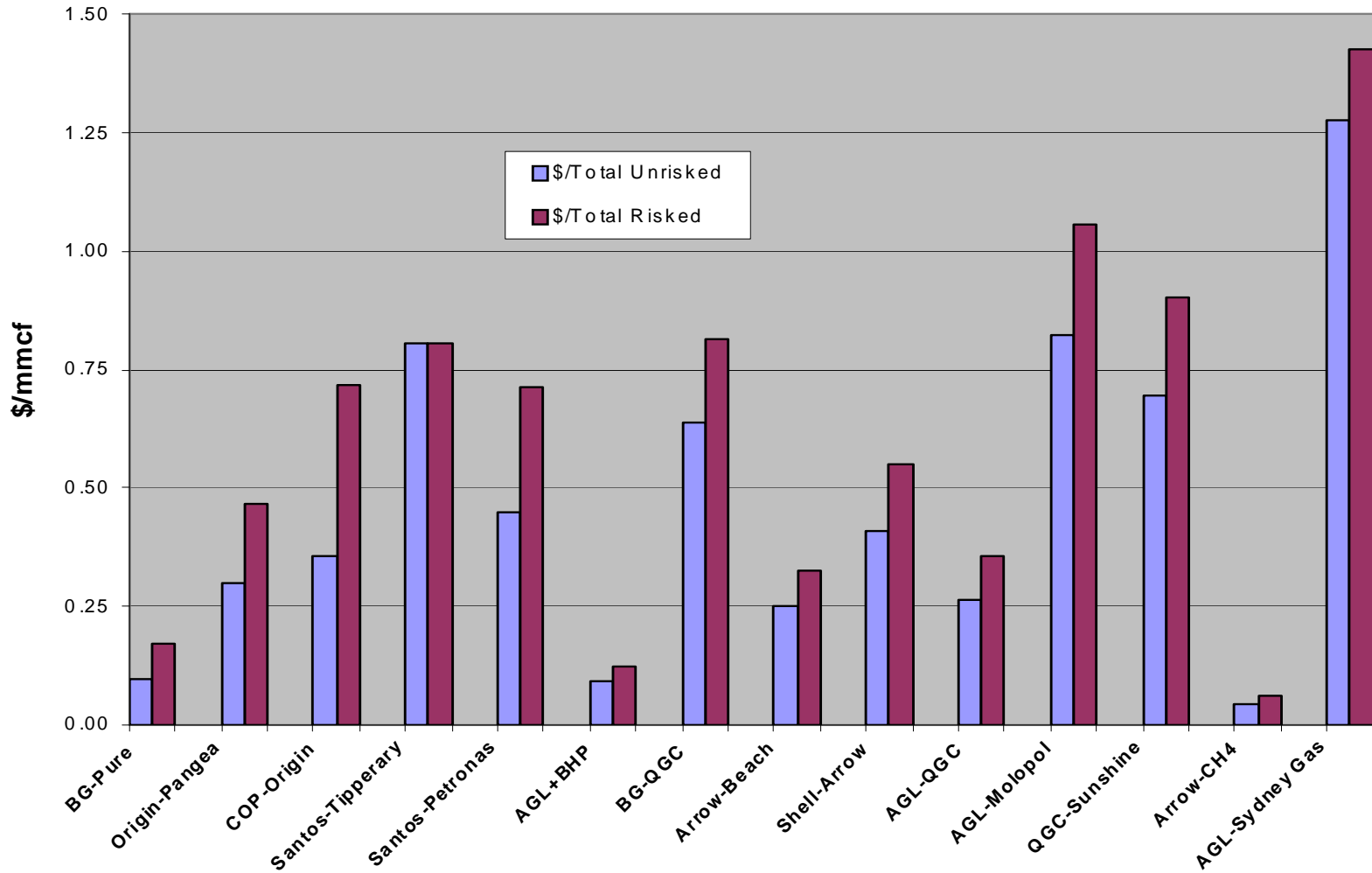
Resource Volumes



Unrisked Resource Value



Risked vs Unrisked Price/mcf



- Unrisked Valuations ranged from \$ 0.10-1.70/mcf
- Risked Valuations ranged from \$ 0.10-1.40/mcf
- But the risk weighting changed the mix and the ultimate value of the deal

and

- In the end AGL divested its stake in QGC in 2008 ...and the deal with BG Group saw a return on investment of 260% in just over 18 months...

It is not enough to use a consistent classification system that reflects only the range of uncertainty; there should be a place to account for the risk.