BLUE OCEAN EQUITIES

EQUITY RESEARCH

Update

Empire Energy Limited

The Americans are coming – do they think the Beetaloo will be bigger than the Marcellus?

...or is the massive gap in acreage values between Empire Energy and its US shale peers just too big to ignore?

First to gas production and cashflow – the path is clear.

With funding secured for the drilling and completion of Carpentaria 5H (Australia's first 3000m horizontal lateral.) and progression of the Carpentaria Pilot Project's surface facilities, there is now a clear line of sight to Empire delivering first sales gas in 1H 2025.

To build out well inventory, Carpentaria 5-H (C-5H) is now funded and will be drilled in 2H 2024. The well will be completed using leading US technology and will be the longest horizontal shale well section drilled in Australia. With 60 frac stages and 5½ inch casing, C-5H will also be Empire's first well of commercial dimensions.

Management understands the shareholder value proposition.

Empire management continue to show excellent capital management skill with the purchase of the Rosalind Park Gas Plant for $2.5 million - versus a new build cost of approximately $80-100million. The 40TJ/day capacity of the plant is in excess of the 25TJ/day required for the Pilot Project and gives scope for increased gas deliveries in the future for minimal capital outlay.

Strategic US shareholders showing the way

Two strategic US shareholders, Bryan Sheffield and Liberty Energy, have taken stakes in Empire Energy following the recent capital raise. Bryan Sheffield now has stakes in both of the companies that only operate in the Beetaloo – he also has a direct interest in the Basin through his private company Daly Waters. Our acreage valuation comps (see Figure 3) give compelling insight into why experienced shale gas investors see value in the Beetaloo Basin.

Valuation

Our valuation methodology moves towards Acreage value comps blended with a Project NPV/Resource valuation.

Valuing Empire's Carpentaria acreage alone at 5-10% of the US Peer median of US$15,580/acre suggests a valuation range of between $0.80 to $1.60 per share – while our NPV/Resource valuation currently sits at $1.00/share (details in Figure 5). We believe that a target price of $1.05/share is warranted as acreage valuations become accepted in the Australian Market. But the risk is to the upside as more US attention focusses on the Beetaloo Basin and the extremely low value currently placed on its acreage.

Date	4 June 2024
Stock rating	BUY
Price target	$1.05
Ticker	EEG-AU
Closing price	$0.20
Implied return (%)	438
Market cap (m)	189
Enterprise value (m)	147
Shares outstanding (m)	1,017
52 wk avg daily vol (m)	0.32
12-month price range	$0.12 - $0.22
Factset Sector	Energy Minerals

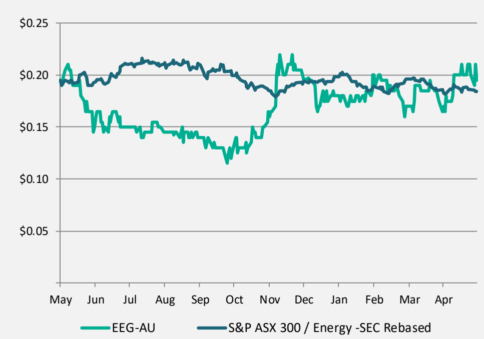
Y/E Jun (A$m)	FY24E	FY25E	FY26E	FY27E
Gas Production (PJ)	0	6.3	9.1	9.1
Revenue	2.5	31.6	93.4	95.9
Growth (% YoY)		1262%	296%	103%
EBITDA		9.6	28.9	30.1
Margin (%)		30%	31%	31%
NPAT		12.2	16.1	16.2
EPS adj. (cps)		NA	NA	NA

Valuation	FY25E	FY26E	FY27E
P/E (x)	NA	NA	NA
EV/Revenue (x)	4.7	1.6	1.5
EV/EBITDA (x)	15.3	5.1	4.9

Contingent & Prospective Resources		
2C Contingent Resources	1.65 TCF	1,927 PJ
2U Prospective Resources	46.6 TCF	49,125 PJ

Top Shareholders	%
Paul Fudge/Pangaea Resources	13.8
Sheffield Holdings (USA)	9.0
Elphinstone Group	8.0
Liberty Oilfield Services	4.7

Share price



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On track to produce the Beetaloo Basin's first gas by 1H2025

Empire is now adequately capitalised to progress the next stage of the Carpentaria Project namely the development of the Carpentaria 25TJ/day Pilot Plant – supplying into the Northern Territory market, a market which is experiencing serious supply shortages.

The recent recapitalisation has resulted in A$71.5 million in funds being available through:

- A$39m - issue of 243.75 million shares at $0.16/share
- A$7.8m - sale of a 4.5% Overriding Royalty Interest (ORRI) to both Bryan Sheffield's Daly Waters (2.25%) & Liberty Energy (2.25%) – the ORRI covers EP 187 only.

In addition to:

- $15.4m through R&D Debt Funding (under the existing Macquarie facility) with the potential to upsize to ~$30million
- A$9.3m – existing cash

This funding will allow Empire to progress the project though a number of milestones:

- Progress through to the formality of the Final Investment Decision on the Carpentaria Pilot Project while simultaneously...
- Drilling and Completion of the Carpentaria 5H well – Australia's first 3000m lateral well. The well will benefit from advanced completions design, which has already been trialled in the Beetaloo.
- Progress the 25 TJ/day (40TJ/day capacity) plant on site following its refurbishment in Roma, Qld.

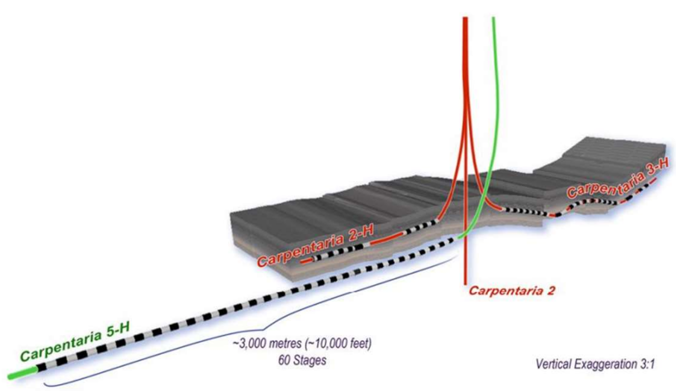
We assume that any additional funding required for surface facilities and commissioning will be achieved through project related debt following the finalisation of a Gas Sales Agreement.

Carpentaria 5H – Australia's longest lateral well

Carpentaria 5H (C-5H) is now fully funded and will be drilled in the 2H of CY2024. With a planned 3000m horizontal section, C-5H will be Australia's longest horizontal shale well. The company has planned the well to have 60 fracture stimulation stages with the intention for the well to be the company's first well of commercial dimensions.

Assuming a 3.5 MMscf Initial Production rate (over 1000m) is achieved, our estimates suggest that the well would have an EUR (Ultimate recovery) of ~10BCF over 20 years.

Figure 1. Carpentaria 5H – schematic diagram (3:1 vertical exageration)



Source: Company

Gas Processing – an example in capital efficiency

The Rosalind Park Gas Plant was acquired from AGL for the bargain price of $2.5 million. The plant has capacity of 42TJ/day, well in excess of the 25TJ/day required for the Pilot Project. We estimate that purchasing a new gas plant of this size would cost in the order of $80-100 million so the saving on capex has been substantial. The acquisition also circumvents any project delays that may have been caused by the lack of availability of critical long lead time items such as compressors. The plant is currently undergoing refurbishment in Roma before being transported to site for reassembly.

The excess capacity of the plant also gives optionality to Empire to supply more gas with minimal capital expenditure.

Figure 2. Rosalind Park Gas Plant at its original site

Source: Company

Valuation – Blended valuation of $1.05/share

Our valuation for Empire Energy of $1.05/share is a blended valuation – using a combination of:

- Acreage multiples (seen in the US Peer Group) **– Range of $0.80 to $1.60 (mid-point $1.20/share)**
- NPV/Resource valuation **- $1.00/share**

US acreage value comparisons - Empire Energy is significantly undervalued.

Our valuation methodology now moves away from a focus on Prospective and Contingent Resources towards a blend of Project NPV and Acreage comparisons. While the use of acreage comps is not familiar in Australia, it is a very important metric in the United States which reflects the nature of unconventional shale gas basins – where resource size is generally very large and resource multiples very small in comparison to conventional hydrocarbon companies.

Our move towards acreage comparisons reflects three significant observations.

- **The consolidation of the US shale gas industry** - The dramatic increase in corporate activity in the United States and resulting consolidation of the shale Gas industry is significant for understanding valuation metrics – the sector spent US$234billion on Merger and Acquisitions in 2023 alone! In the biggest deals, like Exxon's US$59.5 billion acquisition of Pioneer Resources and Chevrons US$53 billion acquisition of Hess, acreage considerations were cited by both acquirors. *The location of the Beetaloo Basin, on the "doorstep" of the major Asian LNG markets, will not be overlooked by the gas Majors.*

- **The Beetaloo Basin's hydrocarbon reservoirs are remarkably consistent** - The homogeneity, continuity and structural simplicity of the Beetaloo's shale gas reservoir makes acreage comparisons appropriate.
- Unlike conventional hydrocarbon production, the drivers of productivity in shale gas development are related to maximising the surface area of a reservoir that a well can access. As first gas to market approaches, we are confident that the concept of "productive acreage" will be increasingly accepted by Australian equity investors.

Comparing Empire Energy's acreage valuation alongside US shale gas peers highlights the yawning gap between the way unconventional gas companies in Australia are valued compared with comps in the US, where the multiples are several orders of magnitude higher (see Figure 3)

The discrepancy can be partly attributed to the US company peers being de-risked producers - however we also believe that the US market has a considerably deeper knowledge of how unconventional gas projects work and are valued.

The valuation gap is even more stark given that Empire;

- Is less than two years away from supplying gas into a domestic market that is already suffering supply shortfalls and is forecast to worsen
- Will be supplying into a domestic market that is continually priced at a significant premium to the US Henry Hub market
- Has already secured a 40TJ/day gas plant for a remarkably cheap price
- Sits on the doorstep of the largest LNG customer base in the world – where low transport costs make Australian LNG exports out of Darwin significantly more attractive than US LNG exports.

Figure 3 shows a comparison of acreage values in the United States. There is a broad range of values across this group with the median value being US$15,580/acre. In this comparison it should be noted that:

- Empire Energy holds approximately 3 million net effective acres across the Beetaloo Basin however we have included three acreage comparisons for the purposes of conservatism.
- We have not included an allowance for the fact that the Carpentaria project is a "stacked play" ie. There are a number of shale reservoirs stacked on top of each other.

Figure 3. Acreage Comparisons with US Shale peers

US Shale Gas Peers	Acres	Enterprise Value	Value	Value	Basins
	million	*US$ billion*	*US$/acre*	*A$/acre*	
Comstock	0.18	5.4	30,390	45,903	*Utica*
Range Resources	0.50	9.9	19,648	29,678	*Appalachian*
Chesapeake	0.84	12.8	15,222	22,992	*~50% Marcellus*
Gulf Port	0.23	3.7	15,943	24,082	*Haynesville*
Antero	0.78	13.7	17,544	26,499	*Marcellus/Utica*
EQT Corporation	1.79	21.4	11,937	18,030	*Marcellus/Utica*
Southwestern Energy	1.02	12.5	12,162	18,371	*Appalachian & Haynesville*
CNX	1.00	6.1	6,089	9,197	*Pennsylvania & Ohio*
USA - Median Peer Value per acre			**15,582**	**23,537**	
Three scenarios…					
Empire - Beetaloo Basin: net acreage	3.00	0.1	33	50	*Beetaloo Basin, Australia*
Empire - Beetaloo Basin: Best 1m acres	1.00	0.1	100	151	
Empire - Carpentaria East acres only	0.46	0.1	211	319	

Source: Blue Ocean Equities.

Figure 4 shows our valuation scenarios for Empire Energy based on the Carpentaria Project acreage and a USA Peer group median value per acre of US$15,580/acre.

Figure 4. Carpentaria East – valuation based on US median Peer group acreage valuation of US$15,580/acre

Carpentaria East valuation using Median US Peer Acreage Valuations*

% of US Peer Median Value	Implied acreage value	Implied Enterprise Value	Implied value
	A$/acre	*A$ billion*	*A$ per share*
2%	471	0.22	**$0.32**
5%	1,177	0.54	**$0.80**
10%	2,354	1.08	**$1.61**
25%	5,884	2.71	**$4.02**

* Note: The implied acreage valuation is based only on the 0.46 million acres within the Carpentaria project. It excludes all other acreage owned by EEG.

Source: Blue Ocean Equities.

Currently, Empire's Carpentaria Project is being valued by the market at between 1% to 2% of the US Peer median – we think the percentage should be at least 5% to 10% given that infrastructure like pipeline connections and the gas processing plant have been secured and gas production will occur in less than two years.

This would suggest a price range of between $0.80 to $1.60 per share (mid point $1.20/share). Substantially higher than Empire Energy's recent trading range.

Blended valuation of Carpentaria and West Beetaloo

Our NPV valuation for Empire Energy is shown in Figure 5 and includes a risked value of the Carpentaria Pilot Project (EP187) and the West Beetaloo assets. Assumptions for the Pilot Project were as follows:

Gas price:A$12/GJ, Average Initial Production rate/1000m: 3.5 mmscf/day, Average well cost: A$25 million

We derive a valuation of $1.00/share through this methodology.

Figure 5. Valuation Overview

Empire Energy Ltd - Valuation Summary	Method	2C Resource (BCF)	Value per mcf ($)	Unrisked Valuation (A$mill)	Unrisked Valuation (A$/share)	Commercial CoS*	Risked Valuation (A$ mill)	Risked Valuation ($A/share)
Exploration, Development & Operating Assets								
Carpentaria (EP187) : 25Tj/day Pilot Plant	Pre tax NPV_{10}			335	0.33	80%	268	0.26
Carpentaria (EP187) : 2C Resource (ex Pilot Plant)	2C Resource	1350	1.00	1,350	1.33	35%	473	0.46
West Beetaloo (EP167 & 168)	2U/2C Resource [1]	9083	0.40	3,633	3.57	5%	182	0.18
Other								
Net Cash/(Debt)				56	0.06		56	0.06
Property, Plant & Equipment				25	0.02		25	0.02
Other Exploration Assets				20	0.02		20	0.02
Capitalised Corporate Costs				(8)	(0.01)		(8)	(0.01)
Total NAV				**$5,411**	**$5.32**		**$1,015**	**$1.00**
Shares Outstanding	1,017,147,401							

** = Chance of Success*

Notes:

1. EP167 & EP168 valued using risked 2U resources converted to 2P reserves multiplied by an estimated NPV per mcf of A$0.20

Source: Blue Ocean Equities

Carpentaria 25TJ/day Pilot Plant – NPV guide

We have calculated an indicative Pre-Tax NPV for the Carpentaria Pilot Plant using the following assumptions:

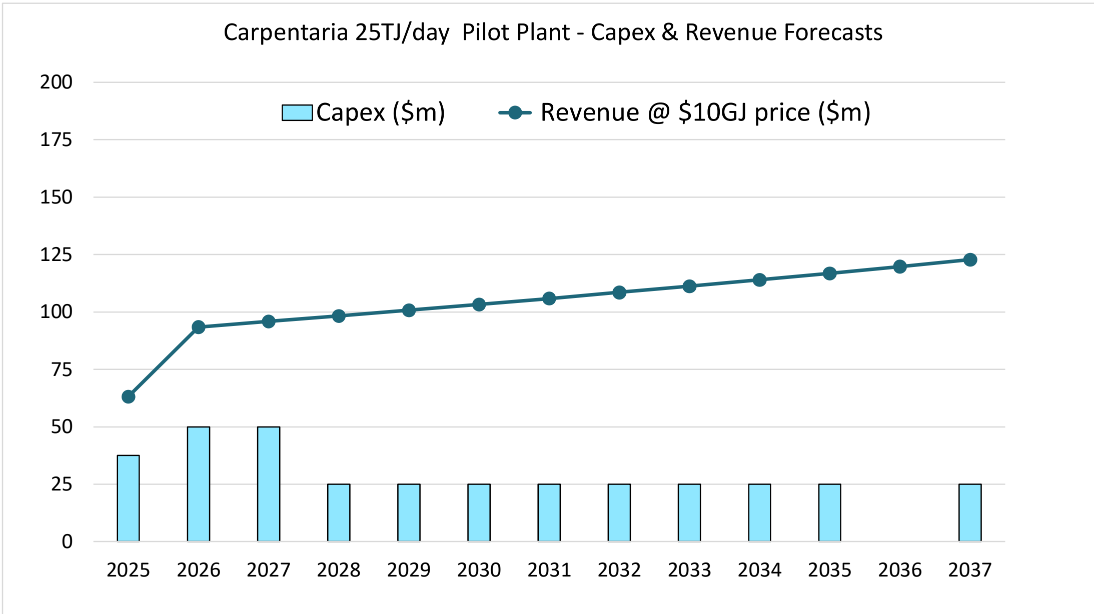
- 20-year cashflows
- 182 PJ delivered gas
- Fixed operating costs - $1.20/Gj
- Capex/variable costs - ~$3.00/Gj
- Transport Costs - $2.70/Gj
- ORRI costs – 15% of Operating Earnings
- Discount rate – 10%

It should be noted that these cost assumptions are BOEQ estimates only. The assumption for transport costs are, arguably, higher than what will be experienced in reality but have been kept at $2.70 as a conservative buffer. We would expect that the total cost per GJ will come down over time though this is not reflected in our numbers.

Revenue and capex assumptions are shown in Figure 6 – capex assumptions are largely the cost of well drilling and completion. The tables in Figure 7 & Figure 8 outline pre-tax NPV sensitivities to the project's Well Capex cost and the Initial flow rates for wells - at $10.00/GJ & $12.00/GJ gas prices.

Note the green arrows on Figure 7 & 8 - these indicate our estimates of how well capex can reduce as more drilling efficiencies are introduced over time – driven by factors like reduced frac sand cost and multiple wells being drilled from single pads.

Figure 6. Carpentaria Pilot Plant Project: Revenue and Capex assumptions



Source: Blue Ocean Equities

Figure 7. Pilot Plant Pre-Tax NPV @ A$12.00/GJ

25TJ/day - Pilot Project Value (PreTax NPV: $million) @ A$12 gas price					
	Well Capex (A$ million)				
Initial Flow Rate per 1000m (GJ/day)	15	20	25	30	35
2,500	372	336	299	262	226
3,500	404	378	351	325	299
4,500	421	401	381	360	340
5,500	432	416	399	382	366

Source: Blue Ocean Equities.

Figure 8. Pilot Plant Pre-Tax NPV @ A$10.00/GJ

25TJ/day - Pilot Project Value (PreTax NPV: $million) @ A$10 gas price					
	Well Capex (A$ million)				
Initial Flow Rate per 1000m (GJ/day)	15	20	25	30	35
2,500	252	216	179	143	106
3,500	284	258	232	205	179
4,500	301	281	261	240	220
5,500	312	296	279	262	246

Source: Blue Ocean Equities.

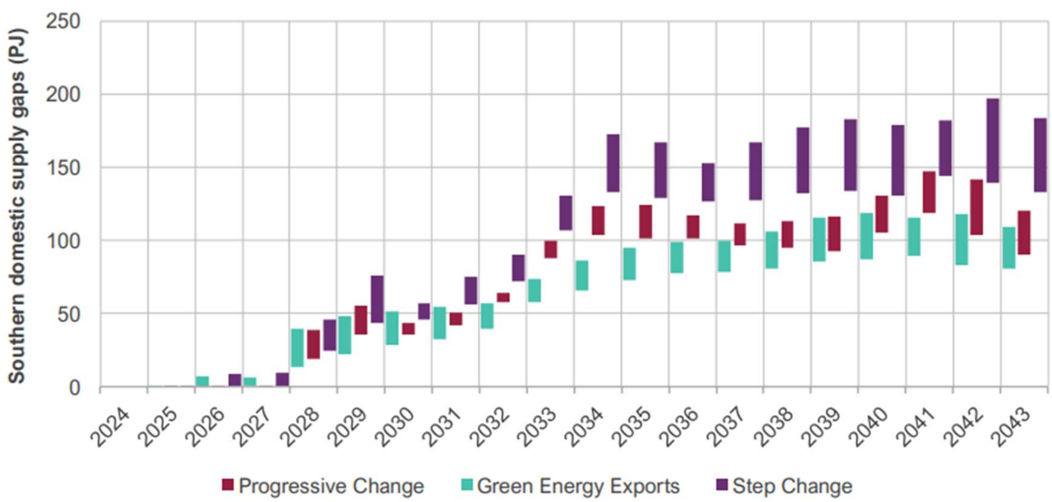
Natural Gas Markets – Australian market update

The natural gas Supply-Demand outlook continues to deteriorate. Forecast gas supply gaps for Australia's populous South East states continue to grow under a variety of scenarios published by the national market operator AEMO. In addition, the latest Gas Statement of Opportunities report (March 2024) has warned that the risks of shortfalls will happen sooner than previously forecast.

AEMO warned that there was potential for seasonal supply gaps as early as 2026 which will worsen, with annual supply gaps, that will require new sources of supply, from 2028. Figure 9 is a chart from AEMO's latest report showing the increasing supply gaps that will occur under the current supply regime. The three different scenarios represent different approaches to a renewables transition.

It is clear that extensive gas project development is required urgently in order to avoid a domestic energy crisis.

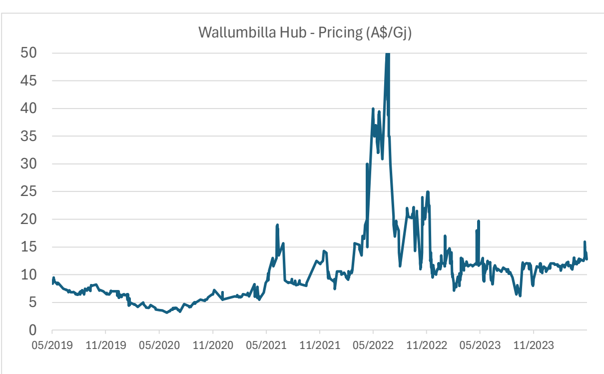
Figure 9. Range of domestic annual supply gaps forecast for Australia's SE coast



Source: 2024 Gas Statement of Opportunities Report, Australian Energy Market Operator.

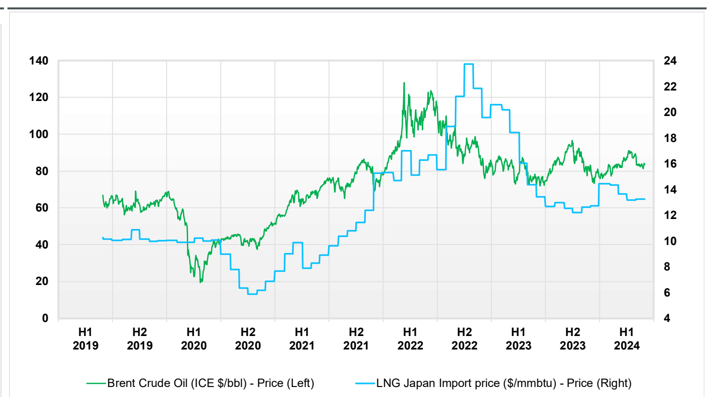
Historic Gas Prices (Figure 10 & 11)

Figure 10. Domestic Gas prices (Wallumbilla Hub)



Source: AEMO, Blue Ocean Equities.

Figure 11. Prices: Brent Crude & Japan LNG Import



Source: Factset, Blue Ocean Equities.

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