

## EMPIRE ENERGY GROUP LIMITED (EEG)

STEPPING TOWARDS PILOT PRODUCTION

Analyst

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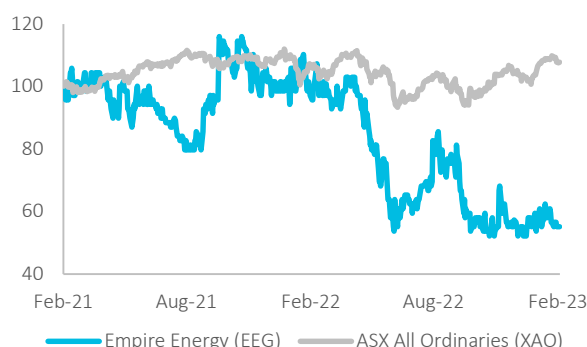
Date

15 February 2023

# SPEC BUY

SHARE PRICE	TARGET PRICE
\$0.19	\$1.25

### RELATIVE SHARE PRICE CHART - 2 YEARS



### COMPANY DATA

Enterprise value	\$134m
Market cap	\$150m
Issued capital	789m
Free float	82%
12-month price range	\$0.18-\$0.40
GICS sector	Energy

### DIRECTORS

Non-Exec Chairman	Paul Espie AO
Managing Director	Alex Underwood
Non-Exec Director	Prof. John Warburton
Non-Exec Director	Peter Cleary
Non-Exec Director	Louis Rozman
Non-Exec Director	Paul Fudge
Alt Non-Exec Director	Jacqui Clarke

### MAJOR SHAREHOLDERS

Pangaea Resources	18.1%
Elphinstone Group	8.3%
Global Energy and Resources	4.2%
Sheffield Holdings	4.1%
Macquarie Bank	3.4%
Energy and Minerals Group	3.4%
<b>Board &amp; Management</b>	<b>21.0%</b>

### IMMEDIATE COMMERCIAL CATALYSTS

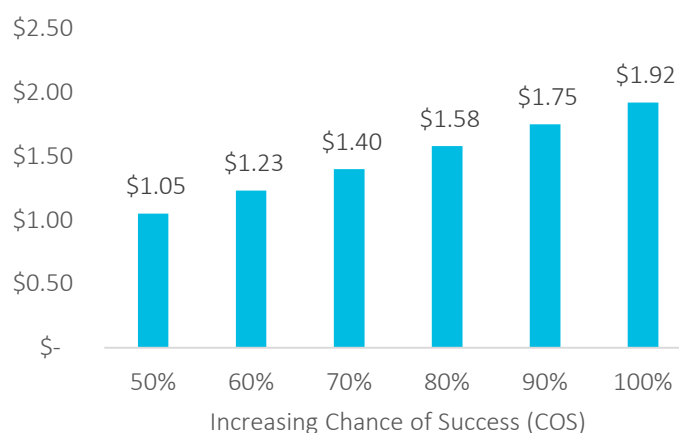
The latest drilling phase at Carpentaria has been completed, and the focus will now shift to the upcoming well-testing program and the plans for pilot gas production.

Key short-term catalysts are the following:

- Testing of the 1,989-metre lateral section in C-3H,
- Completion of the 90-day testing program for the adjacent C-2H well,
- Likely substantial 2C resource upgrade for the Carpentaria region,
- Negotiation of GSA with multiple domestic gas players (may include the upgrade of the Power and Water Corporation MOU),
- Negotiation of Production Licence with NT Government and stakeholders,
- Finalisation of the commercial plans and commitment to a pilot gas development scheme and,
- Potential for initial 2P reserve definition for C-2H and C-3H wells.

**OUR CURRENT VALUATION OF \$1.23 PER SHARE IS BASED ON A 60% COS.**

**FIGURE 1: EEG VALUATION WITH RISING COS**



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## INTRODUCTION

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Empire Energy Group Limited (ASX: EEG) is advancing the appraisal activity on its exciting shale gas opportunities in the Beetaloo Sub-basin in the Northern Territory.

Drilling and testing activity continue in EP 187, located on the eastern edge of the Beetaloo Sub-basin. The previous drilling has confirmed a thick, prospective shale sequence in the target Velkerri Shale, which has tested at strong rates in the initial programs. **This is cause for optimism.**

EEG completed the recent round of drilling, comprising two appraisal wells, Carpentaria-3H and Carpentaria-4V (known as C-3H and C-4V) in December 2022. This low-cost drilling campaign will assist in developing commercial options for the initial production.

The company completed the fracture stimulation of the C-3H well, encompassing a 40-stage stimulation program over the 2,632-metre lateral section. This lateral is the longest drilled in the Beetaloo, underlining exceptional planning and project delivery.

Testing will follow shortly, with strong gas flow rates anticipated. The expected strong flow rates will be a significant sign towards a Final Investment Decision and the commercial pilot development.

EEG remains our preferred play in the Beetaloo Sub-basin, with quality assets, a strong board, and first mover commercial advantage.

## INVESTMENT THESIS

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**Empire is a key player in the momentum of the Beetaloo Sub-basin, representing a leveraged play on the region's economic potential.**

The drilling and testing programs in the Beetaloo Sub-basin continue to enhance the prospects for large-scale commercial development in the region. Nothing seen to date on the technical side has been at the low end of expectations. This supports the high calibre of technical work and the good rocks.

Successful testing and greater resource (and reserve?) definition will assist in adding to the confidence levels and allow movement toward pilot gas production.

Overseas interest has expanded in the Beetaloo gas play, with strong US investment being notable over the past 12 months.

**Our commercial assessment indicates that the 100% owned Carpentaria asset has an unrisks value of over \$1.25 billion compared with Empire's current enterprise value of approximately \$135 million.**

Empire is valued conservatively at 123 cps. Value upside is seen as risks reduce on the Beetaloo gas projects, and work commences on the transformational Pangaea assets.

Our risks valuation derives an implied return of over 500% from current prices.

## IMMEDIATE CATALYSTS

With an eye to the immediate activity, we see numerous positive catalysts for Empire following the recent drilling and fracture stimulation activity.

### TESTING OF THE 1,989-METRE LATERAL SECTION IN C-3H

Testing has commenced at C-3H, with the initial flow results expected shortly. Based on the earlier work at C-2H, we anticipate strong gas flows from the lateral section. The critical measurement point for the well will be the average flow rate over the initial 30-day production period. This is also known as IP30. IP30 rates over 5MMscfgd would be considered commercial in this area, where the shallower section allows for reduced drilling costs and improved economics.

### COMPLETION OF THE 90-DAY TESTING PROGRAM FOR THE ADJACENT C-2H WELL

Testing of the C-2H well was undertaken for a short period (August to October 2022) over a 51-day interval. The flow tests were halted to undertake the nearby drilling activities of C-3H, which shares the same well pad. The company has approval for a 90-day period, and the remaining testing days will be completed soon. Previously, C-2H reported an IP30 rate of 2.4 MMscfgd over the 927-metre interval and an overall average of 2.2 MMscfgd (IP51). The temporary shut-in has allowed the reservoir to "soak", a process that has recorded enhanced flow rates in other prospective shale basins. If the C-2H well benefits from the soak, it will further assist the project economics.

### LIKELY SUBSTANTIAL 2C RESOURCE UPGRADE FOR THE CARPENTARIA REGION

EEG has booked a 2C resource of 396 Bcf in the small area between the C-1H and C-2H wells. The drilling at C-4V has confirmed the lateral continuity of the Velkerri shale to the south of the discovery well, which will likely add substantially to the current 2C gas resource. Based on a similar resource density and an area of 20 sq km around the new well, we consider an upgrade of 300 Bcf (75%) to approximately 700 Bcf feasible. NSAI has been engaged to prepare an updated resource for EP 187.

**TABLE 1: EMPIRE GAS RESOURCE STATEMENT, JANUARY 2022**

Asset	Contingent Resources			Prospective Resources		
	1C	2C	3C	1U	2U	3U
All In Bcf						
Carpentaria (100% EEG)	81	396	1,292	2,571	4,250	8,573
Pangaea (100% EEG)	58	158	416	8,173	27,625	85,335
McArthur (100% EEG)				1,633	11,053	45,380
<b>Total</b>	<b>139</b>	<b>554</b>	<b>1,708</b>	<b>12,377</b>	<b>42,928</b>	<b>139,288</b>

Source: Empire Energy Group Limited

## **NEGOTIATION OF GSA WITH MULTIPLE DOMESTIC GAS PLAYERS**

Increased certainty for the drilling and increased resource/reserves in the Carpentaria area will also promote added discussions with local gas users. EEG has previously announced an MOU with Power and Water Corporation for the potential gas supply from the site. This discussion now appears more urgent following the weak production performance of the offshore Blacktip field, which is the primary source of domestic gas for the Darwin region.

## **NEGOTIATION OF PRODUCTION LICENCE WITH NT GOVERNMENT AND STAKEHOLDERS**

Negotiations have commenced with the NT Government to grant a Petroleum Production Licence in the vicinity of the Carpentaria wells. This grant will require detailed discussions with the government and the local indigenous community and would significantly boost commercial options. The meetings are being held during a period of strong demand for gas, which will provide momentum for the business.

Recent legislative changes in the NT Parliament will benefit gas use from appraisal projects, which will minimise future flaring and enhance gas sales. This demonstrates a positive project stance by the incumbent government.

## **FINALISATION OF COMMERCIAL PLANS AND COMMITMENT TO A PILOT GAS DEVELOPMENT SCHEME**

FEED work has commenced, including activities around pipeline transportation, gas sales agreements, indigenous consents, and regulatory approvals.

After this extensive work program and the completion of engineering design for the pilot project, EEG is planning initial gas sales from the C-2H and C-3H area of EP187 by the end of 2024. An initial funding package (Macquarie Bank) is in place to help facilitate the project.

## **INITIAL 2P RESERVE DEFINITION FOR C-2H AND C-3H WELLS**

Longer term, we envisage the definition of 2P gas reserves in the C-2H and C-3H areas. This is planned for the FY24-25 year, but we see an earlier reserve definition as more likely given the basin wide momentum surrounding these projects. The reserve status will require a strong IP30 production test from the C-3H well, an agreement on gas sales and a step towards a plan for development in the area.

## PILOT PRODUCTION SCENARIO

The modest footprint of the pilot gas project and the existing pipeline network will enhance the planned pilot project. Based on historical developments in the region, new build pipelines would likely add a further two years to this development scenario.

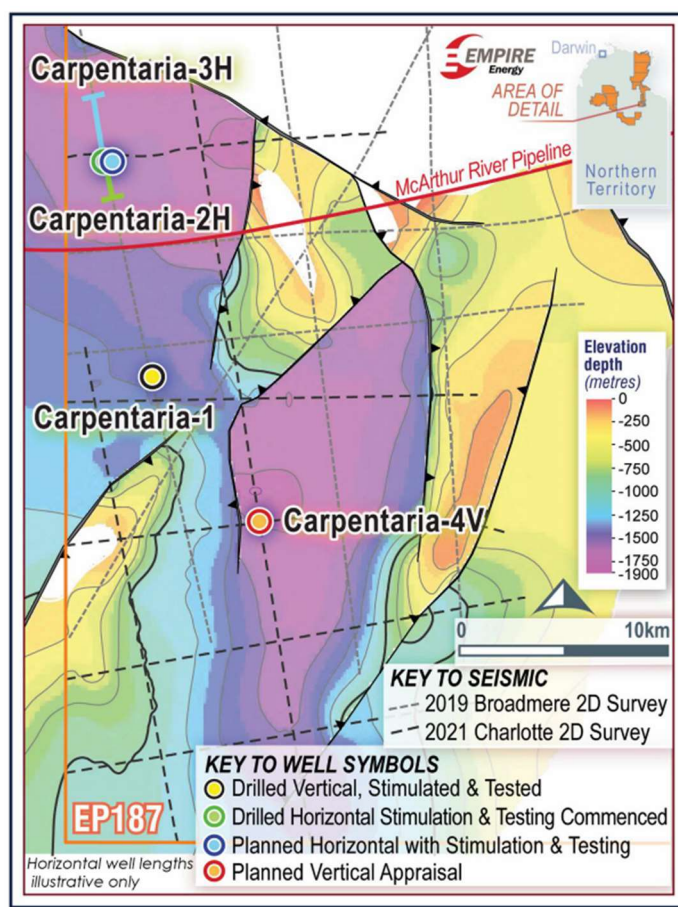
Based on our expected production profile and the revenue potential for gas sales from the pilot project, we have assessed the short-term revenue potential of the pilot. FID is planned for mid-2023.

**TABLE 2: POTENTIAL PILOT YEAR 1 PROJECT REVENUES**

EEG Share (100%)	Real Ex. Plant Gas Pricing (\$/GJ)		
Flow Rates	\$8.00	\$10.00	\$12.00
15 MMscfgd	\$43m	\$54m	\$64m
20 MMscfgd	\$57m	\$71m	\$86m
25 MMscfgd	\$71m	\$89m	\$107m

Source: Blue Ocean Equities

**FIGURE 2: LOCATION OF CARPENTARIA AREA WELLS**



Source: Empire Energy Group Limited

## RISKS

Empire is exposed to all the normal risks associated with exploring and appraising deep shale gas targets, including exploration, fracture stimulation, testing, funding, and commercial risks.

The lifting of the moratorium on unconventional gas in the Northern Territory and the recent re-election of a pro-gas government has reduced some of these risks.

Operational risk is reduced through an experienced board and management team with extensive knowledge in the exploration and appraisal of gas in Australia and overseas.

The Federal government has initiated plans for changes in the east coast gas market, including a \$12/GJ gas price cap on existing domestic gas companies. The EEG assets do not appear to be caught in this market interference. The instigation of this measure will be detrimental to further gas developments in Australia by negatively impacting new capital for energy developments.

Environmental activists can stall or slow exploration appraisal and development activities in the gas business. This risk has been heightened recently after the Senate inquiry and the legal attempts to delay the government funding of the appraisal work.

EEG retains a light carbon footprint with low levels of CO<sub>2</sub> in the test gas to date. The company is developing a carbon strategy commensurate with the size and scale of its potential future operations.

The BOEQ valuation on Empire is based on our assessment of the Chance of Success (currently 60%). If the COS is increased or reduced, this will result in a change in the valuation.

EEG operates modest gas production projects in the USA. Movements in the US gas price may influence revenues and cash flows.

Assuming EEG can delineate an economically viable project and make the transition into production, future revenues will be derived from the sale of natural gas and possible liquids. These prices and volumes may be contracted and could vary from year to year, impacting the company's reported cash flow, profitability, and share price.

## ABBREVIATIONS

2C	Proved and Probable Gas Resource
2P	Proved and Probable Gas Reserve
BCF	Billion cubic feet
COS	Chance of Success
GJ	Gigajoule
LNG	Liquefied Natural Gas
MMscfgd	Million standard cubic feet of gas per day
MOU	Memorandum of Understanding
NSAI	Netherland, Sewell & Associates Inc.
PJ	Petajoule
R&D	Research and Development

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Blue Ocean Equities Pty Limited acted as Joint Lead Manager for the EEG Placement in June 2022 and acted as Underwriter for the recent SPP.

The Analyst of this report owns shares and options in Empire Energy Group Limited.