

EMPIRE ENERGY GROUP (EEG)

Analyst Garry Marsden
Email garrymarsden@boeq.com.au
Phone +61 2 8072 2919
Date November 5 2020

CARPENTARIA-1; A CROCODILE BY THE TAIL

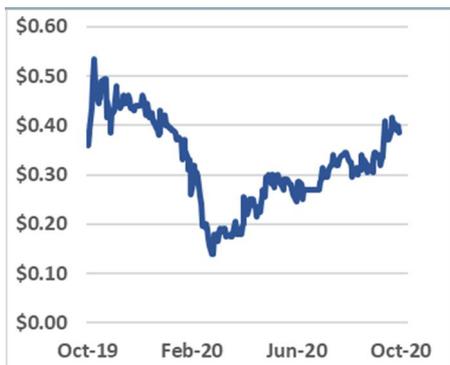
We say	Price	Target	Strategic Target
SPEC BUY	0.37	0.80	1.25

Empire Energy Group Limited (ASX: EEG) continues to pursue its exciting shale gas opportunities in the Northern Territory.

Results at Carpentaria-1 have added confidence that the permit is host to a sizeable wet gas (gas and condensate) resource, which has economic potential. Increasing industry activity in the Beetaloo Sub-basin by Santos and Origin will assist in validating the premise.

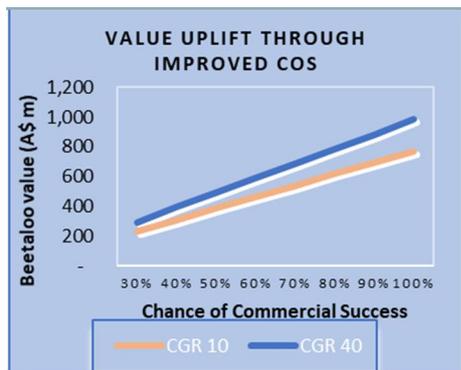
The upside case indicates that EEG's Velkerri Shale is a \$1 billion asset.

EMPIRE SHARE PRICE CHART



Source: IRESS

VALUATION UPSIDE



Source: Blue Ocean Equities

COMPANY DATA & RATIOS

Enterprise value	\$139 m
Market cap (fd)	\$131m
Issued capital (fd)	354m
Free float	85%
12-month price range	\$0.11 – \$0.55
GICS sector	Energy
IMPLIED RETURN	
Implied all-in return	116%

UPCOMING CATALYSTS

- High-level technical assessment of recent drilling
- Potential resource upgrade by NSAI following well results
- Planning and operation of fracture stimulation in 2Q 2021
- Further validation by Santos and Origin activity in the region

WHAT VALUE SUCCESS?

The base valuation of \$0.82 reflects our best estimate of the current exploration program (COS 30: CGR 10)

Our strategic target of \$1.25 reflects further exploration success (COS 50: CGR 10).

The upside case of \$2.90 reflects COS 100: CGR 40.

(see page 10 for nomenclature)

WIDESPREAD ACTIVITY NOW PROGRESSING

Initial success in the Beetaloo programs has been very encouraging.

Santos has reported improved gas flows from Velkerri well.

Origin results from Kyalla expected soon.

Regional activity remains a key catalyst for Empire.

INTRODUCTION

Empire Energy Group Limited (ASX: EEG) is continuing to pursue its exciting shale gas opportunities in the Northern Territory.

The Carpentaria-1 well (EEG: 100%) was the first drilling activity in EP 187 and the first test of Empire's acreage in the prospective Beetaloo Sub-basin.

The initial results at Carpentaria-1 have increased our confidence in the play and assists in highlighting the upside case. The Velkerri Shales were thicker than anticipated and the indications of wet gas and condensate while drilling confirmed the high liquids potential of the area. Both critical learnings have added to the valuation of Empire.

In EP 187, Empire has previously defined a best estimate prospective resource of 2.3 Tcf of recoverable gas in the Velkerri Shale.

The Basin-wide opportunity for gas could exceed 20 Tcf, i.e. A world-class gas province.

Government has added support to the Beetaloo as part of the backing for additional gas production. This backing is being demonstrated in both Canberra and Darwin.

UPGRADE TO VALUATION

Our Empire valuation has increased following the successful drilling of the Carpentaria-1 well, and the positive implications from the strong gas shows encountered in the Velkerri shale.

The upgrades include:

- Increased COS for the project based on drilling and shows. The COS has been lifted from 20% to 30%, adding \$70 million in value to the Velkerri valuation.
- The inclusion, for the first time, of a value on the potential liquids in the Velkerri shales, a modest 10 Bbls per mmcf CGR has been assumed. Regional ranges of CGR in the Velkerri have been reported between 5-40, offering upside potential. The liquids added \$21 million to the valuation. (Note at the upper end of the range, value increment is \$84 million, with a 30% COS)

The upgraded valuation is \$290 million (82 cents per share fd), (COS 30: CGR 10). The Price Target has been lifted to reflect this higher valuation.

The Strategic Price target of \$1.25 per share reflects an increased COS to 50%, which would be appropriate after a successful fracture stimulation and testing campaign in early 2021.

Assuming success based on these parameters (COS 100: CGR 40), the upside value equates to an equity value of \$1,040 million, or \$2.90 per share (based on current fully diluted capital)

PRELIMINARY RESULTS FROM THE DRILLING

The preliminary results of the well have added value in the following areas.

- The Velkerri shales were thicker than expected, adding to the Gross Rock Volume which may be accretive to gas resources,
- Strong gas shows were encountered in the primary shale horizons, indicating the presence of gas. The nearby wells all exhibited gas shows while drilling, so this was anticipated,
- The wetness of the gas (i.e. potential for condensate) was substantially above the nearby offset wells in the Velkerri. The presence of liquids is a substantial positive for project economics. Significant liquids have not been noted in the Velkerri exploration drilling to date by Santos and Origin.
- The successful drilling and the shows have added to the COS.

All these points are accretive to value, in our view.

The drilling activity at Carpentaria-1 commenced in late September 2020. The well ultimately drilled to a depth of 1,916 metres, and a full technical suite of logs was acquired following drilling. The well was cased and suspended for future activity, and the Schlumberger rig was released on October 23, 2020.

The well was designed to test the Kyalla and Velkerri shales on the eastern flank of the Beetaloo Sub-basin. The location was selected to test the wet gas potential of the shales in an area nearby to existing infrastructure and at a shallower depth than the recent Santos and Origin tests. The shallower depth was selected to test for condensate with the gas, which appears to have been a shrewd decision.

THE RESULTS AND WHAT WE LIKED

The Velkerri Shale sequence was shallower than anticipated. In the Carpentaria-1 well primarily due to the absence of the Kyalla section. While the lack of the secondary objective was slightly disappointing, the shallower and thicker Velkerri interval provides a meaningful upside to the commercial potential of the area.

The thicker shales may host larger volumes of gas, and the higher wet gas readings are directly related to the shallower interval.

In summary, the shallower intersection has allowed the rocks to be “less cooked” and therefore maintain a higher proportion of liquid hydrocarbons than if the sediments were at a deeper depth of burial.

The initial stages of exploration strongly suggest that this is a significant gas resource.

BRIEF OBSERVATIONS FROM THE FIELD TRIP

We were fortunate to visit the Carpentaria-1 well site recently, as a guest of Empire Energy. Three key observations of note are discussed below.

Firstly, the Carpentaria-1 well pad was impressively neat by our experience. The nature of the site reflects a strong safety focus by both Schlumberger and Empire, which was also echoed the efficient nature of the drilling operations.

Secondly, the scale of the opportunity is notable. Travel to the site (plane and bus) highlighted the massive area of potential development and the relatively flat terrain. The flat landscape will be an important attribute when development operations are underway.

Lastly, the area hosts some existing infrastructure, which will provide significant cost savings for the development options on this project. The Carpentaria Highway, a 1-2 lane highway traverses east-west across EP 187 and is located only 4 kilometres north of the Carpentaria-1 well pad. This road will provide improved “all-weather” access to several future drill sites.

Furthermore, a gas pipeline easement, with an existing pipeline, also traverses the permit between the Carpentaria well pad and the highway providing further significant cost and time savings for future developments.

The 330 kilometre 6-1/2” pipeline currently services the nearby McArthur River mine and infrastructure. The existing pipeline has a capacity of approximately 16tj per day.

OTHER OPERATIONS IN THE BASIN

In parallel with the Carpentaria drilling, both Origin (Kyalla-117H) and Santos (Tanumbrini-1) have been undertaking flow tests on their previously drilled, and fracture stimulated wells in the Beetaloo Sub-basin.

Santos reported strong results at Tanumbirini from a 4-stage fracture stimulation, with rates in the order of 1.5 to 2.3 mmcfd from the vertical well. Previous they had said this contained >90% methane with less than 5% inerts. Santos described the recent results as “significantly exceeding expectations”. Tamboran, the 25% joint venture partner was also glowing in their praise for the test results. Further testing is expected.

Origin has been testing the Kyalla shales since undertaking the fracture stimulation work in the horizontal well from August 2020. Results are expected soon.

NEXT STEPS

The Carpentaria-1 well was cased and suspended, and the rig was released from the site on October 23, 2020.

Before the well was cased and suspended, a series of wireline logs were undertaken to ascertain critical scientific information about the Velkerri Shale sequence.

The Company will work on the technical aspects with local and overseas industry specialists, with an initial aim to design and implement a fracture stimulation program for 2Q 2021, after the conclusion of the NT wet season and subject to equipment availability.

The Company also plans to re-engage Netherland Sewell and Associates Inc. to further opine on the prospective resources encountered in the drilling campaign. We will be particularly interested in the level of liquids in the updated resource reports.

The work program will also assist in defining the regulatory approvals for the fracture stimulation and testing programs.

Our best estimate of the forward plans as noted below.

- | | |
|--|----------------|
| • Review of final logs and DFIT | December 2020 |
| • Assessment of Prospective Resources | January 2021 |
| • Submission of fracking and testing EMP | January 2021 |
| • Fracture Stimulation activity | April 2021 |
| • Testing of Velkerri Shales | May 2021 |
| • Drilling side-track horizontal | September 2021 |

Note: The forward plans for future drilling and testing will require customary approval from the NT Government. The timing of the activity will also be dependent on equipment availability and commercial outcomes relating to the mobilisation and demobilisation of the equipment.

UPDATED VALUATION

Asset values have been updated following the successful drilling of the Carpentaria-1 well in September and October 2020. The key increments are as follows:

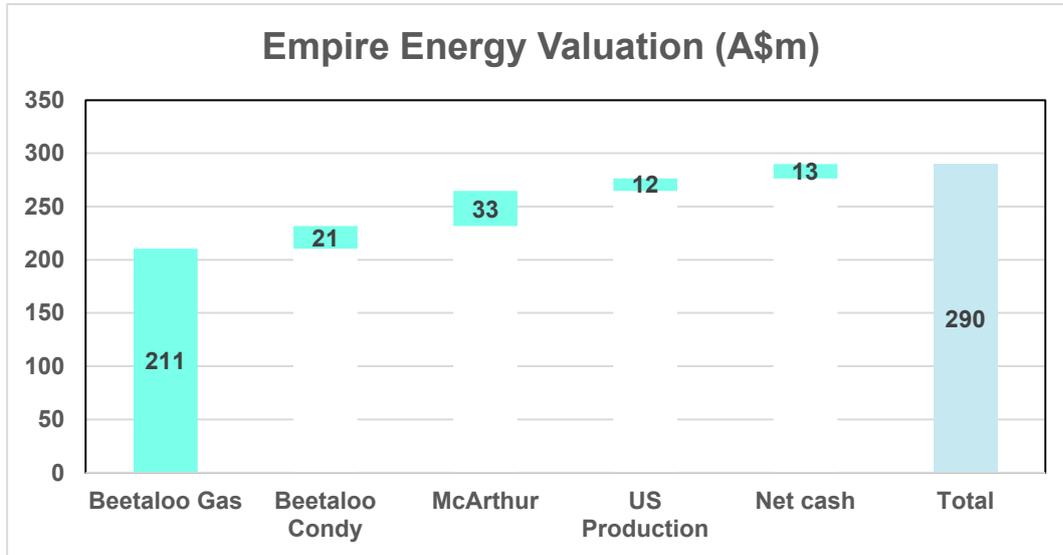
- The increase in the COS from 20% to 30%, following the successful drilling and the extensive gas (plus liquids) shows encountered while drilling.
- The initial inclusion of Velkerri condensate in our valuation, following the recognition of the wet gas shows in the Velkerri A and B sequence. (Assumed CGR of 10)
- Updated cash levels as per October 26, 2020, ASX release
- Removal of Kyalla values as the sequence was absent from the well.

Asset	Basis	A\$ million	CPS
Beetaloo Velkerri Gas only	2,339 PJ prospective resource, @ \$0.50 per GJ, risked at 30% COS	211	60
Beetaloo Velkerri Condensate	23mm Bbls prospective resource, @ \$5 per Bbl, risked at 30% COS	21	6
McArthur Basin	11,000 PJ prospective resource, @ \$0.50 per GJ, risked at 1% COS	33	9
US assets	PDP PV10	12	3
Cash	(as per October ASX Release)	18	5
Future option proceeds		5	1
Debt	(as at June 30, 2020)	(10)	(3)
Total		290	82

* Numbers may not add due to rounding

Based on fully diluted capital of 354 million shares

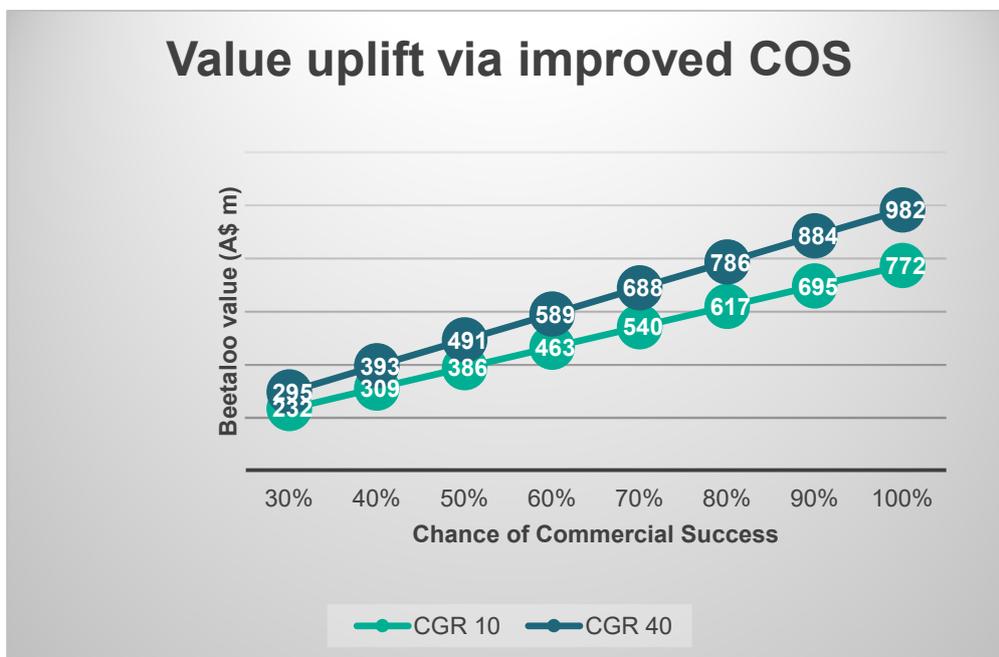
Source: Blue Ocean Equities



Source: Blue Ocean Equities

The current Empire valuation remains dominated by the value of the extensive gas resource in the Velkerri Shale. The Velkerri Condensate value is initially modest but has leverage to the upside.

The value growth through increased COS and increased condensate yields is demonstrated below.



Source: Blue Ocean Equities

PRICE TARGET & RATING

The EEG valuation has been upgraded to 80 cents per share, reflecting the upgrades following the Carpentaria-1 drilling campaign.

A sum of the parts valuation derives the EEG price target, using a risked multiple of the substantial prospective gas resources in the Beetaloo Sub-basin. In keeping with our earlier valuation work, we have assumed a COS consistent with the advancing exploration works, a 60% conversion of Prospective Resources to reserves and capitalisation rates of 50 cents per GJ for gas and A\$5/ barrels for liquids.

Nominal value has also been attributed to the vast McArthur Basin permit areas and the US oil and gas production operations.

The upcoming fracture stimulation work at Carpentaria-1 could result in a further rerating of the Company, driven by the de-risking of the target. The potential upside is also notable if the level of condensate in the gas flows exceeds our modest targets.

Successful activity will reduce the project risk with the defined resource valued as high as \$982 million, based on the Velkerri Shale alone (COS 100: CGR 40).

STRATEGIC TARGET

We have also increased our Strategic Target \$1.25 per share offering the upside case for the upcoming fracture stimulation activities; and a lifting of the COS to 50% (COS 50: CGR 0).

KEY 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 also reduced some of these risks.

The valuation of EEG assumes a risked approach to the potential development of the shale gas in EP 187. The risk is reduced through the presence of an experienced board and management team, who have extensive experience in the exploration and appraisal for gas in Australia and overseas. The board was recently expanded with the inclusion of Peter Cleary, an experienced oil and gas company executive.

EEG retains minor oil and gas production operations in the USA and reports in US\$. Movements in the US\$: A\$ rate can influence the Cashflow Statements and Balance Sheet.

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, which could impact the Company's reported cash flow, profitability and share price.

ABBREVIATIONS

CGR	Condensate Gas Ratio (barrels per mmcf)
COS	Chance of Success
EEG	Empire Energy Group
EMP	Environmental Management Plan
EP	Exploration Permit
fd	Fully diluted
mmcf	Million cubic feet of gas
NSAI	Netherland Sewell and Associates Inc.
PJ	Petajoules
TCF	Trillion cubic feet
tj	Terajoule

NOMENCLATURE

The two main variables in our valuation work on EEG are the COS and the CGR.

In this report, we have adopted a summary basis to easily define the valuation inputs for our valuation work on the Velkerri Shale.

The COS will rise with ongoing success on the appraisal program.

The CGR will be better defined after the flow tests in 2021, but our experience indicates the potential for high levels of condensate.

In summary, a COS of 30 with a CGR of 10 (our base case) is reflected as (COS 30: CGR 10) in this body of work.

CONTACTS

ANALYST

Garry Marsden

Energy Analyst

P +61 2 8072 2919

E garrymarsden@boeq.com.au

AUTHORITY

David O'Halloran

Executive Director

P +61 2 8072 2904

E doh@boeq.com.au

Philip Pepe

Senior Industrials Analyst

P +61 2 8072 2921

E philpepe@boeq.com.au

Stuart Turner

Senior Industrials Analyst

P +61 2 8072 2923

E stuartturner@boeq.com.au

Steuart McIntyre

Senior Resources Analyst

P +61 2 8072 2909

E steuartmcintyre@boeq.com.au

Michael Gerges

Investment Analyst

P +61 2 8072 2935

E michaelgerges@boeq.com.au

Doc Cromme

Institutional Dealing

P +61 2 8072 2925

E doccromme@boeq.com.au

Adam Stratton

Institutional Dealing

P +61 2 8072 2913

E adamstratton@boeq.com.au

Mathan Somasundaram

Market Portfolio Strategy

P +61 2 8072 2916

E mathan@boeq.com.au

Josie Nicol

Dealing Associate

P +61 2 8072 2031

E josienicol@boeq.com.au

HEAD OFFICE

Blue Ocean Equities Pty. Ltd.

AFSL No. 412765

ABN 53 151186935

P +61 2 8072 2988

E info@boeq.com.au

W blueoceanequities.com.au

Level 29, 88 Phillip Street

Sydney NSW 2000

Australia

DISCLAIMER

This document is a private communication to clients and is not intended for public circulation or for the use of any third party, without the prior approval of Blue Ocean Equities Pty Limited. This is general investment advice for Institutional and Sophisticated Investors only and does not constitute personal advice to any person. Because this document has been prepared without consideration of any specific client's financial situation, particular needs and investment objectives you should consult your own investment adviser before any investment decision is made on the basis of this document.

While this document is based on information from sources which are considered reliable, Blue Ocean Equities Pty Limited has not verified independently the information contained in the document and Blue Ocean Equities Limited and its directors, employees and consultants do not represent, warrant or guarantee, expressly or by implication, that the information contained in this document is complete or accurate. Nor does Blue Ocean Equities Limited accept any responsibility for updating any advice, views opinions, or recommendations contained in this document or for correcting any error or omission which may become apparent after the document has been issued.

Except insofar as liability under any statute cannot be excluded, Blue Ocean Equities Pty Limited and its directors, employees and consultants do not accept any liability (whether arising in contract, in tort or negligence or otherwise) for any error or omission in this document or for any resulting loss or damage (whether direct, indirect, consequential or otherwise) suffered by the recipient of this document or any other person.

DISCLOSURE

Blue Ocean Equities Pty Limited, its employees, consultants and its associates within the meaning of Chapter 7 of the Corporations Law may receive commissions, underwriting and management fees from transactions involving securities referred to in this document, and may from time to time hold interests in the securities referred to in this document. Blue Ocean Equities Pty Limited and associates may hold shares in Empire Energy Group Limited (EEG) at the date of this report and this position may change at any time without notice.

Garry Marsden holds shares in Empire Energy Group Limited.