# EMPIRE ENERGY GROUP (EEG)

## MATERIAL UPGRADE TO GAS RESOURCE IN BEETALOO

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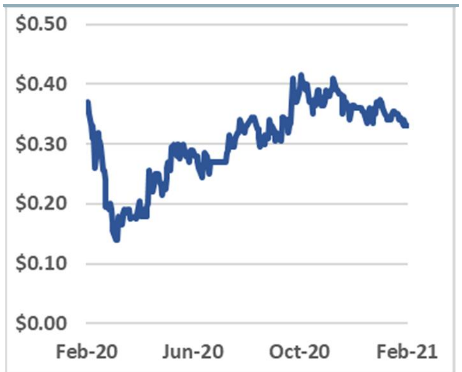
| We say | Price | Target | Strategic Target |
|---|---|---|---|
| **SPEC BUY** | 0.33 | 1.10 | 1.40 |

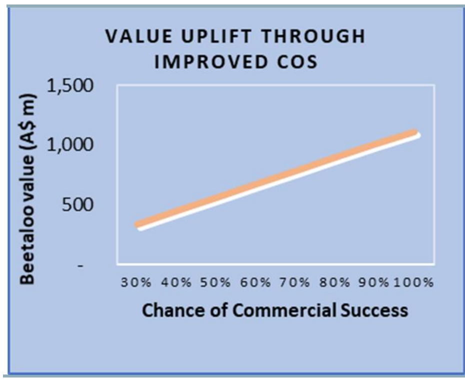
Empire Energy Group Limited (ASX: EEG) continues to pursue its exciting shale gas opportunities in the NT. New technical data from the drilling and core results have generated further interest. The NSAI report has upgraded the Prospective Resource by 47% to 3.5 Tcf of gas with associated condensate of 27 million bbls. This is an outstanding result and a further step towards commercialisation. The upside case indicates that EEG's Velkerri Shale could be a $1 billion-plus asset. We upgrade our Target 38% to $1.10, Maintain Spec Buy.

### EMPIRE SHARE PRICE CHART




Source: IRESS

### VALUATION UPSIDE




Source: Blue Ocean Equities

### COMPANY DATA & RATIOS

| | |
|---|---|
| Enterprise value | $123 m |
| Market cap (fd) | $117m |
| Issued capital (fd) | 354m |
| Free float | 85% |
| 12-month price range | $0.14 – $0.41 |
| GICS sector | Energy |

### IMPLIED RETURN

| | |
|---|---|
| Implied all-in return | 142% |

## UPCOMING CATALYSTS

- Planning and operation of fracture stimulation in 2Q 2021
- Approval for further seismic in EP187
- Initial plans for horizontal drilling later in 2021.
- Further validation of the Beetaloo Basin by Santos and Origin

## VALUE UPGRADED

The Empire valuation has been upgraded by 38% following the release of the NSAI report.

Our Base value of $1.11 reflects the upgraded resources.

**Our chance of success is unchanged, pending the upcoming testing program, which will provide an added catalyst to valuation growth.**

## ACTIVITY STILL PROGRESSING

Initial success in the Beetaloo programs has been very encouraging.

**Santos has reported improved gas flows from Velkerri horizontal well.**

**Origin results from Kyalla are ongoing.**

**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.

Initial results from the extensive log and core programme at Carpentaria-1 have been unveiled, and these results were released in early February. The Core results, recently undertaken by W.D. Von Gonten & Co. (a US specialist in the field of unconventional gas) have provided a substantial lift in our confidence levels based on the raw scientific data.

The NSAI results, reported today, have again upgraded the scale of the gas opportunity and significantly have added depth to the commercial argument, with the initial booking of condensate resource numbers. As previously reported, we believe that even modest volumes of liquids can add 20-25% to the project's value.

Previously, NSAI has defined a best estimate prospective resource of 2.3 Tcf of recoverable gas in the Velkerri Shale. This new review has upgraded the gas resource to 3.5 Tcf gas. The initial booking of a Contingent Resource in EP 187 is also a major positive step for the project.

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

**We believe that Empire offers the best-leveraged entry into the Beetaloo Basin.**

## VALUATION AND TARGET PRICES UPGRADED

**The base valuation of Empire has been increased by 38% from 80 cents to $1.11 per share,** based on the material upgrade in the Prospective gas and condensate Resources as defined by NSAI.

The initial booking of Contingent Resources in EP 187 gives added confidence to the project's potential economic development. However, at this stage, we have not increased our Commercial Chance of Success on the project.

The potential for higher COS will be derived from a successful flow testing program at Carpentaria-1. This is planned for April/May 2021.

Our Strategic Target of $1.40 per share reflects a potential increase in the COS to 40% in the event of successful testing.

# RESULTS FROM NSAI WORKS

The extensive data set from the 2020 drilling program at Carpentaria-1 has been collated internally and despatched to industry experts for further analysis and testing.

In January 2021, WD Von Gonten assessed the key core properties of the Velkerri shale sequence and reinforced the premise that these sediments are highly prospective for the development of a significant shale gas resource.

The upgraded resource report from Netherland Sewell and Associates Inc. (NSAI) has utilised the drill and core results and further elevated the gas resource within EP187. Furthermore, they have also added an initial Prospective Resource on the permit's liquid (condensate) potential, which may be readily available for development with the gas in the permit. These liquids can add substantial value to project economics.

In short:

- Gas Prospective Resources rose by 47% to 3,446 Bcf,
- Condensate Prospective Resource was reported at 27 million barrels; and
- a Gas Contingent Resources was reported at 41 Bcf from the limited area around Carpentaria-1.

**This is an excellent resource base for a small-cap company.**

# OTHER OPERATIONS IN THE BEETALOO BASIN

## SANTOS

In the adjacent permit, EP161, Santos has continued to test the Tanumbrini-1H well over the past months. In October, they reported flow rates as high as 10mmcfgd from the well, with average flows of approximately 2.3mmcfgd over a 90-hour test process. The flows were reported enthusiastically, with forward plans for further testing and added drilling at and nearby the existing infrastructure.

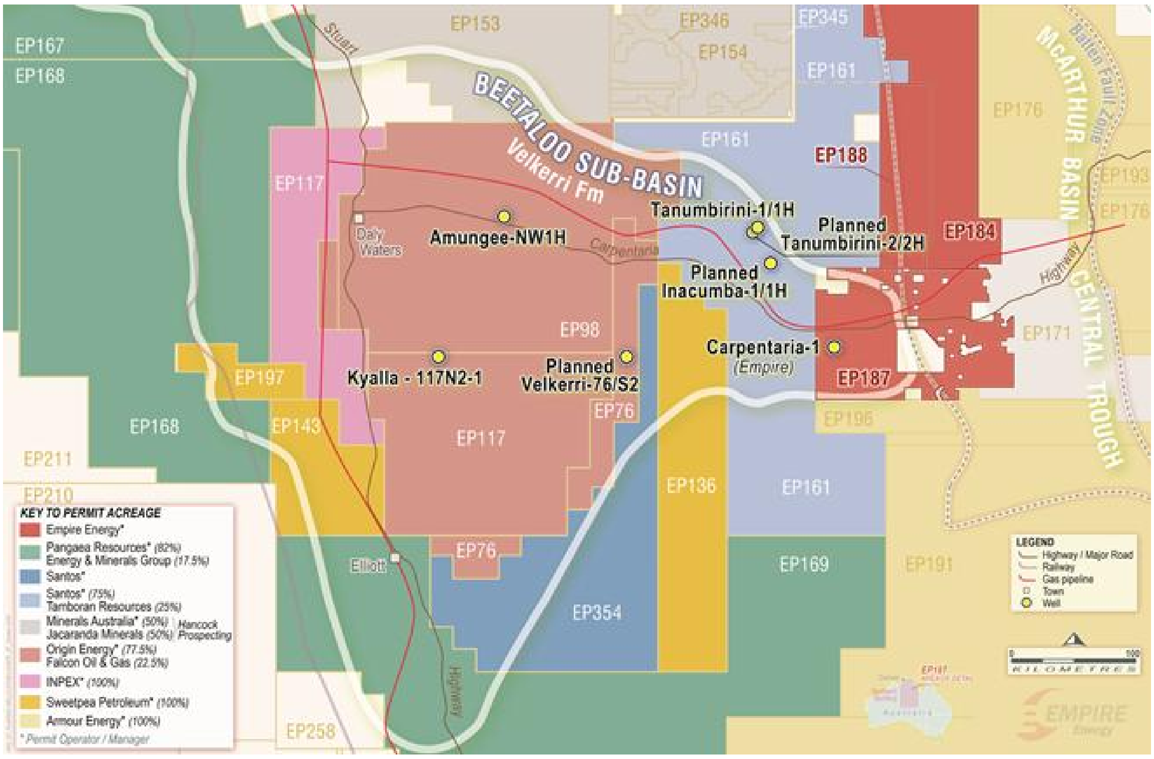
Santos plans two further horizontal wells during 2021.

## ORIGIN

Further west in EP117, ORG has been testing the shallower Kyalla shales in the Kyalla-117 N2 1H ST2 well over the summer months. Testing has been interrupted through low flow rates, which has needed a nitrogen lift to assist. Rates between 0.4-0.6mmcfgd have been reported, with strong liquids indications. Further test results will be forthcoming later in 2021.

Further drilling by Origin at Velkerri-76 is planned for 2021.

**Figure 1: Beetaloo activity map**




Source: Company Data

## SWEETPEA

Sweetpea Petroleum lodged an EMP in late 2020 to acquire 549 kilometres of 2D seismic within EP 136. EP 136 is a narrow permit located between the Santos and Origin acreage, west of Carpentaria-1. The EMP was approved in November 2020. The seismic timing is currently unknown, although it is cost-effective if the acquisition was incorporated into Empire's nearby seismic program.

In late 2020, Tamboran reported the purchase of Sweetpea Petroleum Pty Ltd.

## ARMOUR ENERGY

Armour holds a large tranche of acreage to the east of Carpentaria-1, covering the McArthur and South Nicholson Basins. In late 2019, Santos announced a cash and carry of $80m into the Armour South Nicholson Basin acreage. In late 2020, Santos acquired the remaining interests for a cash payment of $12.25 million. Santos now owns 100% of this permit area.

Armour continues to hold the northern acreage, covering the adjacent part of the McArthur Basin.

## CURRENT AND NEXT STEPS

The Carpentaria-1 drilling activity initiated an extensive work program for Empire, testing and reviewing the large store of data obtained from the drilling activity.

The receipt of the W.D. Von Gonten workstream has enabled the new data to be input into the updated NSAI resource report. This work's results have provided critical data for the upgrade in the Prospective Resource at Carpentaria-1 and to help assess the size of the condensate resource present in this area. Both these factors are crucial to the commercial outcomes for Empire.

Also, the Company has lodged EMP's for the acquisition of further seismic in EP187.

Our best estimate of the forward plans as noted below.

| | |
|---|---|
| • Approval of seismic EMP | February 2021 |
| • Fracture Stimulation activity | April 2021 |
| • Testing of Velkerri Shales | May 2021 |
| • Seismic acquisition | July 2021 |
| • Further potential drilling activity | September 2021 |

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

## UPDATED VALUATION

The Empire asset values have been updated following the announcement of the increased gas resources. The key increments are as follows:

- The 47% increase in prospective gas resource in the Velkerri, as reported by NSAI,
- The inclusion of the firm condensate resource numbers. The initial resource numbers for the condensate were slightly higher than previously estimated.
- Updated cash and debt levels as per the December 2020 quarterly report,
- The inclusion of an initial Contingent Resources has added to our confidence level on the potential development opportunity.
- Our COS is unchanged at this point; however, we would anticipate an improvement in the event of a successful flow testing program at Carpentaria in Q2 2021.

| Asset | Basis | A$ million | CPS |
|---|---|---|---|
| Beetaloo Velkerri Gas only | 3,446 Bcf prospective resource, @ $0.50 per GJ, risked at 30% COS | 310 | 88 |
| Beetaloo Velkerri Condensate | 27mm Bbls prospective resource, @ $5 per Bbl, risked at 30% COS | 24 | 7 |
| 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 at December 31, 2020) | 16 | 4 |
| Future option proceeds | | 5 | 1 |
| Debt | (as at December 31, 2020) | (9) | (3) |
| **Total** | | **391** | **111** |

* Numbers may not add due to rounding

Based on fully diluted capital of 354 million shares

Source: Blue Ocean Equities

## PRICE TARGET & RATING

The EEG valuation has been upgraded following the 47% rise in Contingent Gas Resource in EP 187. **The improved gas resources have lifted our valuation 39% to $1.11 per share (fully diluted)**.

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 and testing work at Carpentaria-1 could further rerate the Company, driven by a de-risking of the target.**

## STRATEGIC TARGET

We have also increased the Strategic Target 27% to $1.40 per share, offering the upside case for the upcoming fracture stimulation activities; and lifting the COS to 40%.

## 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.

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

| | |
|---|---|
| Bcf | Billion cubic feet |
| CGR | Condensate Gas Ratio (barrels per mmcfg) |
| COS | Chance of Success |
| EEG | Empire Energy Group |
| EMP | Environmental Management Plan |
| EP | Exploration Permit |
| fd | Fully diluted |
| mmcfg | Million cubic feet of gas |
| NSAI | Netherland Sewell and Associates Inc. |
| PJ | Petajoules |
| TCF | Trillion cubic feet (i.e. 1,000 Bcf) |
| tj | Terajoule |

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