

# EMPIRE ENERGY GROUP (EEG)

## MASSIVE UPGRADE IN BEETALOO GAS RESOURCE

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We say

Price

Target

Strategic Target

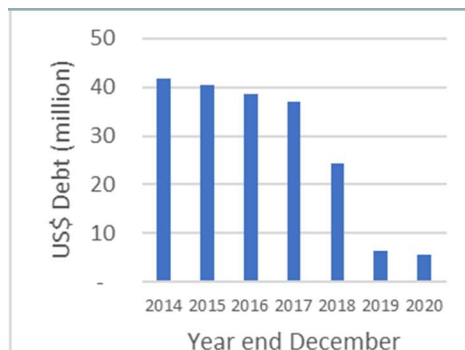
**SPECULATIVE BUY      0.24      0.75      0.85**

Empire Energy Group Limited (ASX: EEG) is continuing to advance its exciting shale gas opportunities in the Northern Territory. Netherland Sewell & Associates Inc. (NSAI) one of the worlds' leading petroleum resource consultancy companies, has opined on a major gas resource upgrade for the Velkerri Shale sequence in EP 187. This 96% jump in Prospective Resource in the Velkerri is a major positive for Empire.

**EMPIRE SHARE PRICE CHART**



**EMPIRE US\$ DEBT REDUCTION**



Source: Company Data

**COMPANY DATA & RATIOS**

Enterprise value	\$64 million
Market cap	\$64 million
Issued capital	269 million shares
Free float	90%
12-month price range	\$0.11 – \$0.55
GICS sector	Energy
<b>IMPLIED RETURN</b>	
Implied all in return	210%

## UPCOMING ACTIVITY

- NSAI results on gas resource
- Carpentaria-1 well later in 2020
- Fracture stimulation of Carpentaria-1
- Positive regional results from Beetaloo

## MAJOR RESOURCE UPGRADE

NSAI has opined on a major resource upgrade for the Velkerri Shale sequence in EP 187. This 96% jump in Prospective Resource in the Velkerri is a major positive for Empire.

NSAI also provided a Prospective Resource estimate for the Kyalla shale sequences, a shallower unit, which has higher oil and liquids potential.

## EXPLORATION IS PROGRESSING

Exploration activity has resumed in the Northern Territory, following the lifting of the moratorium on unconventional activities. Drilling and testing commenced in the adjacent areas, with initial encouraging results.

We expect drilling at Carpentaria-1 to occur later in 2020.

## INTRODUCTION

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

Substantial ongoing exploration campaigns are being planned in the Beetaloo Sub-basin by Santos and Origin. Empire remains the only listed Australian small cap company with exposure to this large gas province, with commercialisation options in both Darwin and the East Coast markets.

## MAJOR RESOURCE UPGRADE

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**This 96% jump in Prospective Resource in the Velkerri is a major positive for Empire.**

NSAI also provided a Prospective Resource estimate for the Kyalla shale sequences, a shallower unit, which has higher oil and liquids potential.

## VALUATION UPGRADE

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The core value of Empire has increased following the 96% upgrade in the Resource assessment by NSAI.

**We have lifted our base value by 55% from 49 cents per share to 76 cents per share, based on the upgraded potential of the core Beetaloo Sub-basin acreage.**

## MASSIVE RESOURCE UPGRADE

Empire has announced a major independent upgrade in the Prospective Resources held within its 100% owned acreage in the Beetaloo Sub-basin and the McArthur Basin in the Northern Territory.

The NSAI report has seen a 96% rise in the Prospective Gas Resource within the key Velkerri shale sequence to 2,339 Billion Cubic feet (Bcf). This incorporates gas in the three main Velkerri shale units (Velkerri A, B and C). The report also opines for the first time on the liquid potential of the shallower Kyalla shale sequence, where a modest, but strategically important 14 million barrels of liquids has been identified as a Prospective Resource.

Reservoir	Undiscovered Original Gas-in-Place (BCF)			Unrisked Gross (100%) Prospective Gas Resources (BCF)			Unrisked Gross (100%) Prospective Oil Equivalent Volumes (MMBOE)		
	Low Estimate (1U)	Best Estimate (2U)	High Estimate (3U)	Low Estimate (1U)	Best Estimate (2U)	High Estimate (3U)	Low Estimate (1U)	Best Estimate (2U)	High Estimate (3U)
Lower Kyalla	496	724	1,073	24	72	161	5	14	34
Middle Velkerri*	9,303	12,516	16,597	1,283	2,339	4,751	215	397	825
Barney Creek*	17,667	59,652	155,058	1,633	11,053	45,380	274	1,886	8,011
<b>Total*</b>	<b>27,466</b>	<b>72,892</b>	<b>172,728</b>	<b>2,940</b>	<b>13,464</b>	<b>50,292</b>	<b>494</b>	<b>2,297</b>	<b>8,870</b>

\*Note: Empire has aggregated the OGIP and prospective resources estimated by NSAI by arithmetic summation

\*Note: NSAI did not evaluate the Wollgorang Formation

Source: Company Data

### The upgraded resource is a major positive for Empire.

The expansion of the Prospective Resources in the Beetaloo has been accretive to our valuation of the business, while the credibility of a globally recognized resource consultancy provides added confidence to our investment thesis.

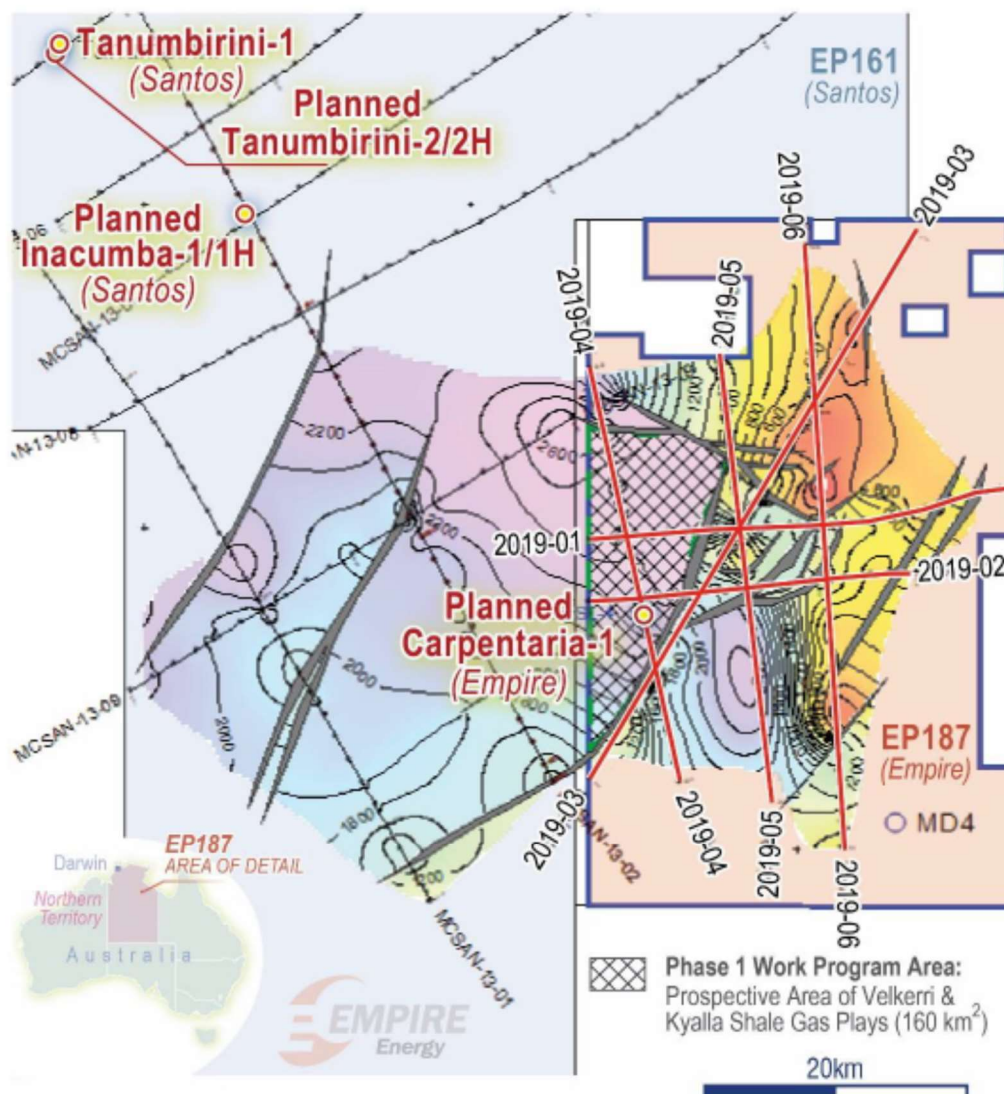
## EXPLORATION UPDATES

Empire completed the planned 2D seismic survey across its prime Beetaloo Sub-basin acreage in late 2019. Initial interpretation has confirmed a thick sequence of prospective sediments on the western portion of EP 187, as expected. The seismic data set has allowed the Empire to confirm the basin extension and has also confirmed the presence of both Velkerri and Kyalla shale sequences in the permit. These two shales are the primary targets for the large exploration campaigns being undertaken by adjacent operators (Santos and Origin) in their high-profile exploration plans in the region.

The seismic indicates that the prospective intervals are continuous across this portion of the Beetaloo Sub-basin. The prospective sequences demonstrate similar seismic signals to the nearby Tanumbirini well and importantly, are located at a shallower depth, provide greater liquid potential and likely lower drilling costs. Both these factors would be accretive to value in a commercial outcome.

The seismic allowed advances in the EP 187 exploration program and assisted in defining the optimal well location for Empire's planned Carpentaria-1 well. The seismic was also crucial in raising confidence in the acreage, which was a key indicator for the upgraded Prospective Resource estimate by NSAI.

Well planning for Carpentaria-1 is underway. Extensive well design work has been undertaken and the company is advancing rig selection for the drilling in 2020. In parallel, EEG is developing a Covid-19 management plan in conjunction with other industry participants and APPEA. The plan will ensure the risk of Covid-19 transmission is minimized among the contractors, the workforce and more importantly through the local Northern Territory communities.



Source: Company Data

## NEXT STEPS FOR EMPIRE

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The drilling of Carpentaria-1 (EEG 100%) is expected in the second half of 2020 with funding in place following the capital raising from late 2019. The well will investigate both the Kyalla and Velkerri shale sequences, with a preliminary expected total depth of approximately 2,500 metres.

Empire will be engaging technical experts both locally and abroad to assist in gaining maximum information from the Carpentaria-1 data set. This engagement of overseas experts is consistent with the decision to engage NSAI to undertake the recent resource review on the Beetaloo and McArthur Basin acreage.

At the conclusion of drilling, the well will be extensively logged, and further rock sampling will be undertaken with side wall cores prior to Diagnostic Fracture Injection testing (DFIT). This testing will be done to assess the application of further works on the well, with an aim to conduct fracture stimulations and testing of the vertical well.

Empire is expected to undertake a multi-stage fracture stimulation program on Carpentaria-1 as the second stage of the assessment of EP 187. Empire is well advanced on the relevant governmental approvals for this phase, although final consent has not yet been received. In accordance with results, the multi-stage stimulation will likely focus on the Kyalla and Velkerri “B” sequence, which has been widely accepted as hosting the highest potential for gas in the basin. The upper and lower Velkerri sequence (Velkerri A and C) may also be stimulated and tested, dependent on post-drill potential and results.

We would expect the fracture stimulation work to be undertaken either in late 2020 or after the end of the wet season in 2021. The activity will be dependent on drill timing and government approvals.

In our view, the testing of the initial vertical well is a prudent step to readily assess all the initial zones of interest and allow the forward focus on the path of greatest commercial outcome. It is a nice problem to have in a new exploration play.

Expected longer term activity in EP187 would involve the drilling of horizontal wells, initially targeting the most prospective intervals highlighted from the technical assessments of the vertical well drilling and testing campaigns.

## UPDATE ON REGIONAL ACTIVITY IN NT

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Drilling and stimulation activity was initiated in the Beetaloo in late 2019 after the long-awaited moratorium on unconventional activities was lifted by the Northern Territory government.

The most advanced of the previous exploration programs, led by Santos and Origin, have progressed in 2020. However, the oil price decline and the Covid-19 pandemic have arrested the progress and further activity is on hold.

In EP 161, immediately west of Empire's acreage, **Santos Limited** completed a 4-stage stimulation on the previously drilled Tanumbirini-1 well which subsequently tested at rates in excess of 1.2 million cubic feet per day (mmscfd). This was an exceptional result from a vertical fracture stimulation and was reported by Santos to have "exceeded initial expectations".

Santos subsequently booked an initial net 2C Contingent Resource at Tanumbirini of 22 million barrels of oil equivalent (mm BOE), which equates to a 170 PJ of gross gas in the immediate vicinity of the Tanumbirini well.

Forward plans for drilling two new horizontal wells at Tanumbirini and nearby Inacumba were slated for 2020 but have been delayed due to internal cost-cutting measures and the issue surrounding Covid-19. Santos has confirmed a big investment in the Northern Territory, primarily focussed on delivering additional gas into the Darwin LNG scheme. The Beetaloo acreage appears to be a crucial part of this long-term plan.

Santos operates the project with a 75% joint venture share. Tamboran Resources Limited (Unlisted) retains the remaining 25% share.

To the east of Santos, **Origin Energy** has operated the Kyalla 117 well which entailed the drilling of a vertical well and a kick-off into an extended reach horizontal well. After some drilling issues, the horizontal well reached a lateral extent of 1,579 metres. Fracture stimulation and testing activities have been delayed due to the Covid-19 issues. At this point, ORG anticipates a restart involving testing at Kyalla and further drilling to be undertaken from late 2020.

Origin operates the Beetaloo project with a 77.5% equity interest in the Joint venture. Falcon Oil and Gas (TSX and AIM listed) reduced its holding to 22.5% after a recent farmout transaction with Origin. The farmout values the permit areas at approximately \$330 million and emphasises the confidence in the progress of the venture by the Origin.



## UPDATED VALUATION

The release of updated Prospective Resource numbers for Empire's acreage has allowed us to revisit the valuation from our Initiation Report in November 2019. The 96% jump in the Beetaloo Resource assessment and the initial incorporation of numbers for the Kyalla sequence has an obvious and real impact on the Company Valuation, as per the table below.

The work by NSAI has undoubtedly increased the level of confidence for investors in the Resource assessments, although we have not changed our value methodology to capture this perceived value improvement. In keeping with our initial valuation work, we have assumed varied chance of commercial success, a 60% conversion to reserves and applied capitalisation rates of 50 cents per GJ and A\$5 per Bbl for liquids. US asset values have been downgraded marginally, in keeping with lower gas prices.

Asset	Basis	A\$ million	cents per share
Beetaloo Velkerri target	20% COS, based on 1,400 PJ of gas, capitalised at \$0.50/GJ, A\$5/bbl	155	58
Beetaloo Kyalla target	20% COS, 8 mm Bbls of condensate, capitalised at A\$5/bbl	8	3
McArthur Basin target	1% COS, based on of 5,200 PJ of gas, capitalised at \$0.50/GJ	26	10
US gas assets	PV10 (1P, PDP only)	13	5
Cash	As at March 2020	11	4
Debt	As at March 2020	(11)	(4)
Future option proceeds		0	0
Total Assets (fully diluted)	(267 million shares) *	203	76

Totals may not add due to rounding

\* Fully diluted capital includes issued shares and rights but excludes the exercise of the outstanding options (with Exercise prices between 30-32 cents).

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