

Emerging Company

Empire Energy Group

Plenty 2C and do at Carpentaria-1

SPECULATIVE BUY (no change)

Current price:	A\$0.36
Target price:	A\$0.643
Previous target:	A\$0.525
Up/downside:	78.6%
Reuters:	EEG.AX
Bloomberg:	EEG AU
Market cap:	US\$91.98m A\$116.6m
Average daily turnover:	US\$0.06m A\$0.08m
Current shares o/s	323.9m
Free float:	60.9%



Price performance	1M	3M	12M
Absolute (%)	0	-5.3	2.9
Relative (%)	0.3	-9	7.9

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Analyst(s) own shares in the following stock(s) mentioned in this report:

– Empire Energy Group

- EEG's unrisks resource estimate for EP187 has increased to 3.5TCF (+43%) and 2C contingent resource of 41BCF has been booked for the first time.
- The company's upcoming vertical frac program at Carpentaria-1 will identify the most productive sub-formations to target for development.
- Early commercialisation is still some time away but there are options nearby.
- We retain our SPECULATIVE BUY rating and upgrade our price target to 64.3cps (+22%).

Carpentaria progress and resource upgrade

In 2020 EEG completed drilling its vertical Carpentaria-1 well and took samples of the Velkerri shale it encountered. After the samples were analysed, Netherland Sewell and Associates (NSAI) upgraded its unrisks gas resource estimate for EP187 to 3.5TCF (+43%). It also estimates a further 27MMbbl of oil liquids are present as well as recognising 41BCF of 2C contingent resource.

Work program

EEG's next step is to frac the existing vertical well to determine which of the zones within the Velkerri formation will be the most promising targets for horizontal drilling. The company is currently tendering the work to contractors with a view to commence activities in 2QCY21. We understand the frac itself can be completed within a few days but cleaning out the well and recovery of the fracturing fluids may take 1-2 months. EEG intends to fund the work program from its current cash balance of A\$12.3m. In its release to the market EEG also identified six other potential well locations that are outside the scope of currently planned activities.

Path to early commercialisation

We think the recognition of 2C resource at Carpentaria-1 makes it worthwhile to revisit the opportunities for EEG to develop some of its resources without the need for significant infrastructure investments. The 16TJ/d McArthur River pipeline runs nearby to EEG's EP187 tenement and is the most obvious destination for EEG's early producers. We anticipate that future horizontal pilot wells to be drilled around Carpentaria-1 could be converted to production wells. This would provide EEG with early cashflow and is not dependent on major investments in infrastructure capital. The capacity of the local infrastructure is limited of course but it can allow EEG to do a substantial amount of de-risking work on its shale assets before a decision is needed on development at scale.

Investment view

EEG is still in the early stages of exploring its tenement and commercial development at scale is still likely years away. However, we like the early development options the company has and the clear support the basin has from the Northern Territory and federal governments. There is likely to be more capital required to expand the drilling program but if those wells can prove the consistency of the resource across tens of kilometres of ground, then the upside for EEG's resource could be significant. We maintain our SPECULATIVE BUY rating with an increased price target of 64.3cps (+22%) after factoring in the updated resource estimate, Q4 net cash and updated exchange rates.

Figure 1: Valuation summary

Valuation summary	Bear Case	Base case	Bull case
NT prospective resource (A\$ m)	52.4	187.0	310.2
US 1P reserves (A\$ m)	10.5	10.5	10.5
US probable reserves (A\$m)	5.0	5.0	5.0
Total O&G Assets	67.9	202.5	325.7
Net Cash (A\$m)	5.8	5.8	5.8
Total Valuation	73.7	208.3	331.5
Shares on issue (m)	323.9	323.9	323.9
Per share value (A\$ cps)	22.8	64.3	102.3

SOURCE: MORGANS RESEARCH, COMPANY

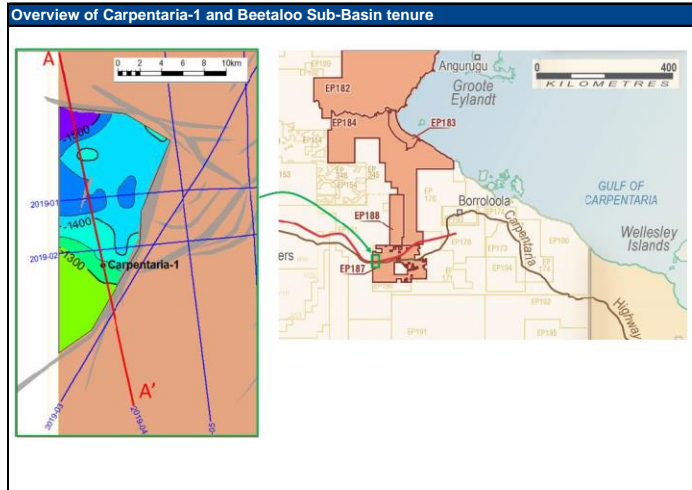
Empire Energy Group

as at February 23, 2021

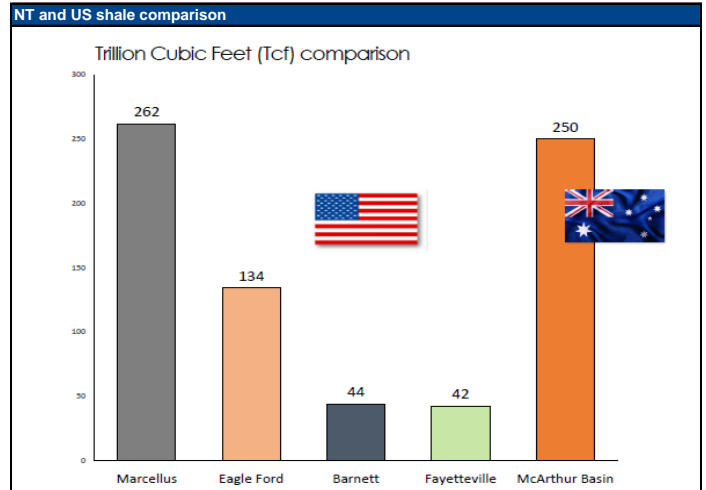
Market cap (A\$m):	116.6	Rating:	SPECULATIVE BUY
Shares outstanding (m):	323.9	Price (A\$):	0.36
Free float (%):	60.9	Target price (A\$):	0.643
Website:	https://empireenergygroup.net/	Upside/downside to target price (%):	78.6

Company description

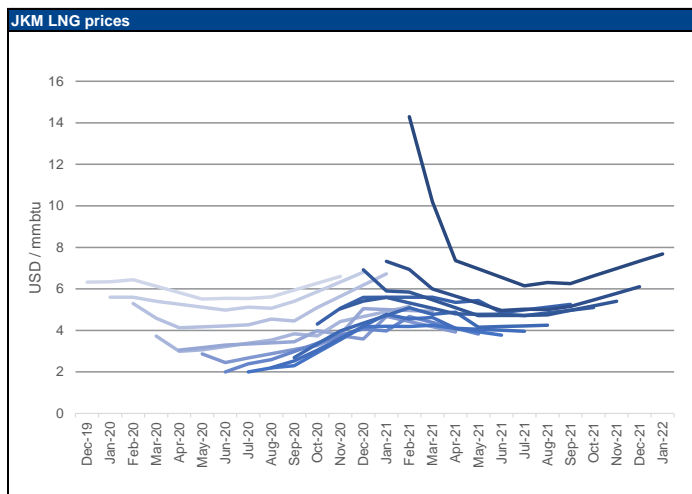
Empire Energy is a junior oil and gas company with assets in the USA and in the Northern Territory. The US assets produce gas from the Appalachian basin while the Northern Territory assets are being explored and appraised. The company is focused on proving up its 13.5Tcf of prospective resource in the Beetaloo Sub-basin and McArthur Basin. Its first exploration well, Carpentaria-1, intersected gas and liquids in the Velkerri shale formation and is located near to the McArthur River zinc-lead mine. Origin (ORG) and Santos (STO) are also exploring in the basin and Santos holds tenure adjacent to EEG's.



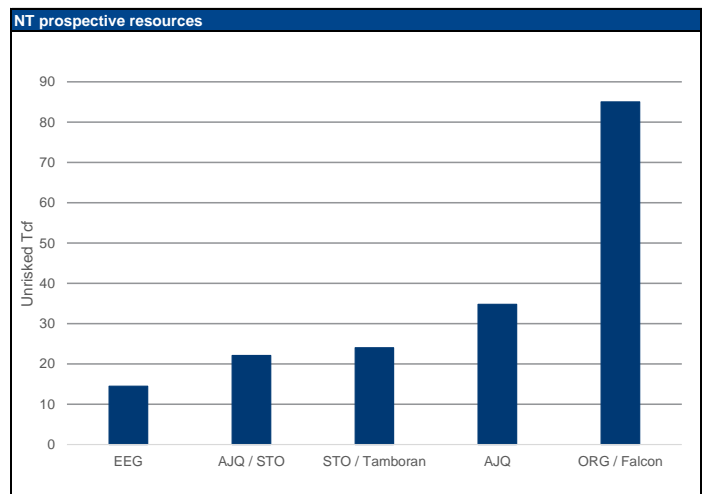
SOURCE: EEG



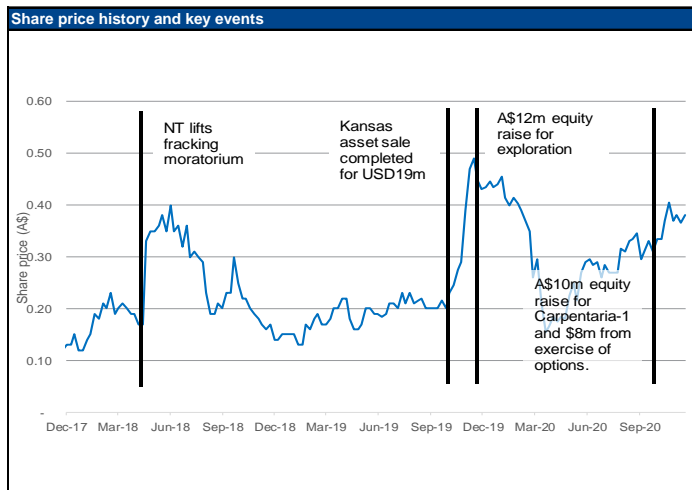
SOURCE: EEG



SOURCES: MORGANS RESEARCH, BLOOMBERG



SOURCE: MORGANS RESEARCH, COMPANY REPORTS



SOURCE: MORGANS, IRESS

Risks and drivers

Value drivers:

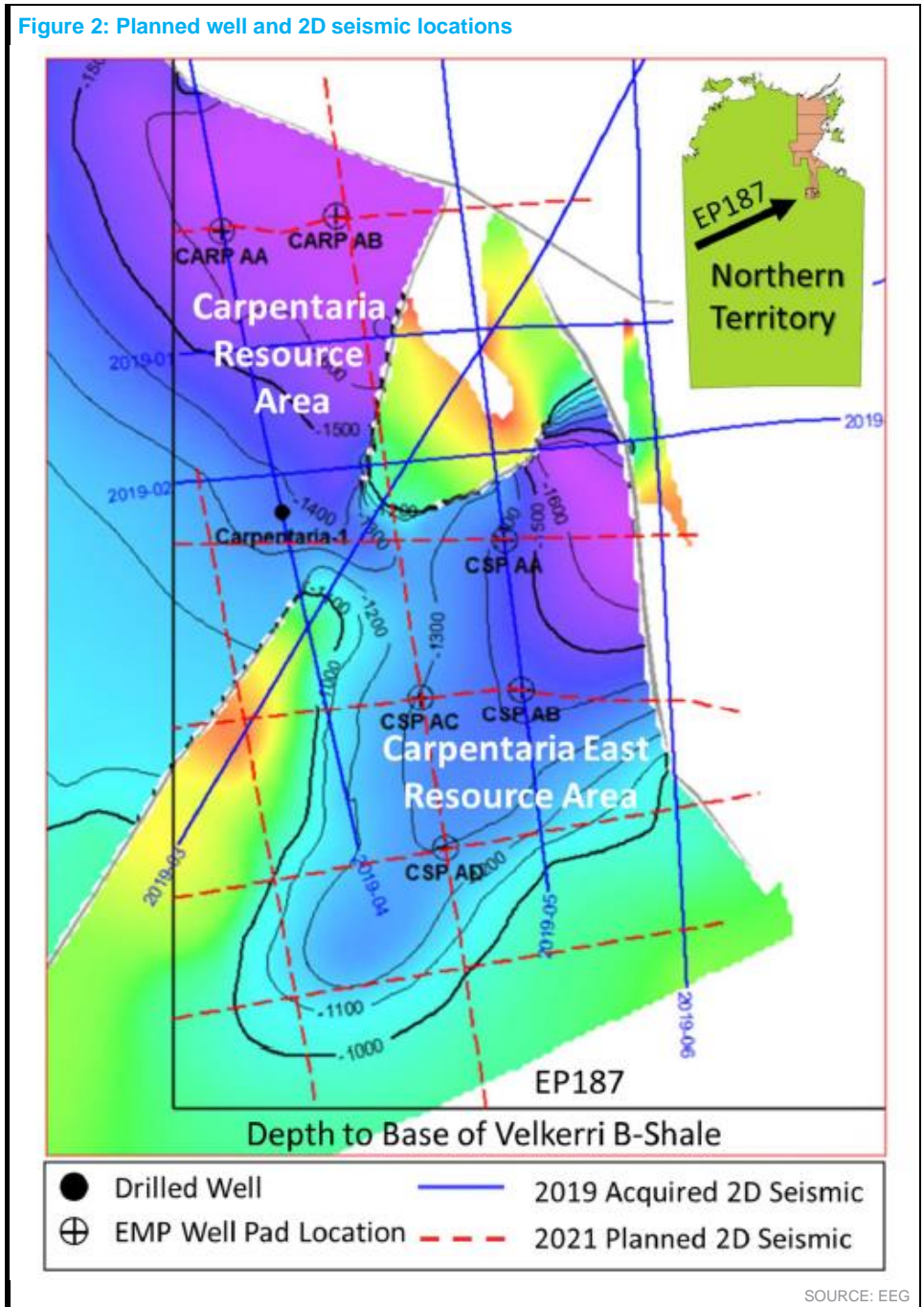
- Exploration success in upcoming work programs.
- Exploration success of peers working in the area.
- Commodity prices.

Risks:

- Exploration success.
- Regulatory changes from the NT government.
- Community relationships with traditional owners.
- Commodity prices namely: oil, gas, carbon and currency.
- Interest rates.
- Changes to tax regimes.

SOURCE: MORGANS RESEARCH

Figure 2: Planned well and 2D seismic locations



Valuation and risks

Figure 3: Changes to Velkerri resource estimates

	BCF	MMboe
Previous prospective gas resource estimate	2,411	397
Prospective gas resource increase	1,035	170
Current prospective gas resource	3,446	567
Prospective oil liquids resource		27
Velkerri total		594

SOURCES: MORGANS, COMPANY REPORTS

We retain our previous risking factors and apply them to the updated Velkerri resource estimate to produce our updated base case valuation of 64.3cps. Our assumed A\$ / boe multiple has been reduced following our increased long-term assumption for the A\$:US\$ but this is offset by a higher net cash position in Q4.

Figure 4: Undeveloped gas resource

Formation	Unrisked volume (Mmboe)	Multiple (A\$ / boe)	Unrisked value (A\$m)	Risk factor (%)	Riskd volume (Mmboe)	Riskd value (A\$m)	Riskd value (A\$ cps)
Kyalla - prospective resource	14	6.8	94.6	97.0%	0.4	2.8	0.9
Velkerri - prospective resource	594	6.8	4,013.5	97.0%	17.8	120.4	37.2
Barney Creek - prospective resource	1,886	6.8	12,743.2	99.5%	9.4	63.7	19.7
Total Undeveloped Gas	2,494	6.8	16,851.4	98.9%	27.7	187.0	57.7

SOURCE: MORGANS

Similarly to our base case, we also apply the same risking assumptions as our previous note to derive our updated bull and bear cases. Our bull case scenario assumes a 94% risk factor for the Velkerri and Kyalla which increases the riskd value of the NT resources to 96cps. Conversely our bear case scenario assumes that flow tests are unsuccessful on Carpentaria-1 and assigns a 99.5% risk factor to the Velkerri and Kyalla resources and a 99.75% risk factor to the Barney Creek resource which reduces the total estimated Australian resource value to 16cps.

Figure 5: Valuation summary

Valuation summary	Bear Case	Base case	Bull case
NT prospective resource (A\$ m)	52.4	187.0	310.2
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SOURCE: MORGANS

Risks

Investors in EEG face a number of risks:

- Exploration success in the Northern Territory – the bulk of the value we see in EEG comes from their prospective resources and investor sentiment could turn negative if the next exploration program is not successful.
- Commodity prices in the US, Australia and internationally – investor sentiment towards the larger oil and gas sector will be impacted by commodity prices and a small portion of US production is unhedged which could lead to lower earnings than our forecast.
- Industry regulation in both the US and Northern Territory could impact the company's ability to sustain its activities at an acceptable cost if regulations are tightened.
- Carbon regulation – changes to policy in Australia or internationally could impact the relative attractiveness of gas compared to other energy sources.
- Social license to operate and relationships with traditional owners – will be key to be able to operate without significant public opposition or legal challenges from traditional owners.
- Ongoing success in raising funds to continue with exploration programs – EEG is in the early stages of exploration so it will likely need further capital before it can enter production to be able to produce cashflow to sustain further exploration activity.
- Interest rates will influence the interest costs of the Macquarie loan.
- Tax regulation both in Australia and the US will impact operating cash flows.

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