

### Positioning for the “future normal”

Empire Energy Group Limited (ASX:EEG) is a junior oil and gas producer and explorer with onshore oil & gas shale assets. EEG holds the largest acreage position (>14.5m acres) in the highly prospective, potentially global-scale NT McArthur-Beetaloo basins. This province is fast developing as a gas-rich (and potentially liquids-rich) option to boost east coast Australia’s future energy needs, as well as feeding Darwin’s expanding LNG export terminals, amid strong policy support from both Northern Territory (NT) and Federal governments. The Beetaloo Basin alone is considered to contain recoverable shale dry gas volumes of over 100 Tcf, with liquids upside. EEG also owns conventional gas/oil assets in the US Appalachia, 80%-hedged at US\$2.50/mcf for 2020. In March, EEG received approvals to drill its Carpentaria-1 vertical appraisal well into the Kyalla and Velkerri shale targets, aiming to confirm recent better-than-expected seismic mapping results. Crystallising EEG’s longer-term potential rests on successful drilling and securing strategic funding and infrastructure support to commercialise the acreage. Given exceptional COVID-19 uncertainties, EEG has acted decisively to secure its US debt facility covenant waivers until year-end, while conserving cash (A\$11.2m gross) and protecting staff and local communities, by deferring drilling until a safe-work plan can be finalised with local authorities.

### Business model

EEG is a junior oil and gas producer/explorer, focused on maturing its portfolio of onshore, long-life oil and gas fields. The company holds substantial exploration acreage in Australia’s NT McArthur-Beetaloo basins and is the 2<sup>nd</sup> largest gas producer in the US Appalachia NY State. EEG’s NT assets are at an early exploration stage. Given the region’s high prospectivity, success from future drill programs could see cashflows within 36-48 months, assuming links and upgrades to existing pipeline infrastructure are delivered in parallel.

### Fast-acting measures target long term business sustainability

EEG has reacted decisively to COVID-19 uncertainties to protect all staff, local communities and funding partners. EEG is deferring its NT drilling program, while working closely with local authorities and partners to implement “safe-work” practices. EEG is both gross (A\$11.2m) and net cash (A\$0.26m) positive, while negotiating US debt covenant waivers until year-end and paying down its loan facility from US\$7.5m to US\$6.675m. EEG’s US business is 80%-hedged at a floor price of US\$2.50/mcf for 2020, with additional hedges in place until 2023. Less than 1% of total production (~3m bbl) is exposed to oil prices, while gas output runs at ~1.7bcf pa. **Robust results from EEG’s 20/21 programs could evolve its prospective resource (P50) of 1.85bln Boe (11 Tcfe) into a contingent resource (2C), better positioning the company to attract strong potential funding partners.** Read-throughs from Beetaloo neighbour activities (eg Origin and Santos) and regional access negotiation success could also inject value.

### Valuation

We have incorporated the impact of the 2Q20 commodity prices which has had the effect of reducing the long run Brent average oil price to US\$48.13/bbl (previously US\$53.65). This has resulted in an adjustment to our base case valuation of \$133m or \$0.51/share (previously \$0.61/share). EEG has a number of event drivers over the coming 6-12 months which in our view hold potential to generate a sizeable uplift in NAV.

### Historical earnings and RaaS Advisory estimates

Year end	Revenue (US\$m)	Gross Profit (US\$m)	NPAT reported (US\$m)	OCFPS (AUD cps)	EPS Adj (AUD cps)	Price/Book (x)
12/18a	6.6	1.9	(5.3)	(0.15)	(1.41)	14.5
12/19a	5.4	1.2	(12.0)	(4.12)	(9.29)	2.4
12/20e	4.7	1.4	(3.3)	1.32	(1.95)	4.0
12/21e	4.4	1.1	(3.7)	2.82	(2.22)	6.9

Source: Company data, RaaS Advisory Estimates for FY19a, FY20e and FY21e

### Energy exploration & production

15 April 2020

#### Share details

ASX Code	EEG
Share price (date)	\$0.18
Market Capitalisation	\$47.4M
Shares on issue	263.3M
Net cash	~\$0.26M
Gross cash	~\$11.2M

#### Share performance (12 months)



#### Upside Case

- Drilling success in McArthur-Beetaloo Basin generates significant commercial outcomes for EEG’s EP187
- Drilling program proves the south-eastern extension of the Beetaloo Basin into EP187
- Drilling success generates high-value LT strategic partner & funding options

#### Downside Case

- McArthur-Beetaloo Basin EP 187 2Q 2020 drilling is unsuccessful, negatively impacting value of EP 188
- Equity funding issues are encountered which require highly dilutive deals to be concluded.
- Fracking success in NT/Qld pushes onshore energy prices to sub-economic levels.

#### Board of Directors

Alex Underwood	Managing Director/CEO
Paul Espie AO	Non-Executive Chairman
John Gerahty	Non-Executive Director
Dr John Warburton	Non-Executive Director

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## Looking beyond COVID-19

On March 31, EEG announced 2 key prudent and proactive measures to mitigate the impact caused by COVID-19:

- (1) The board **deferred its investment decision regarding the drilling** of Carpentaria-1 in EP187, EEG's key near-term value driver, until the company could be confident that the first stage vertical appraisal program could be conducted in a safe, responsible and cost-effective manner.
- (2) The company has **negotiated with its US business lenders to waive all financial covenants** until year-end, requiring an additional principal repayment of US\$0.6875mn. Debt at 31-March now stands at US\$6.675mn. The US business is 80%-hedged at domestic natural gas prices of \$2.50/mmBtu until year-end against current spot gas prices of US\$1.75/mcf. Additional hedges for the US assets are in place until 2023.

### Net Cash comfort zone

Of critical importance, given deepening global financial liquidity risks, EEG remains in a **net cash position**. The company holds gross liquid assets of A\$11.2m and net cash of ~A\$0.26m.

EEG concluded 2019 in a net cash position for the first time since 2011, highlighting the conservative strategic funding approach taken by EEG's current board and management. This follows the sale of its Kansas assets for US\$19.25m in September and a capital raise of A\$12m in mid-November 2019.

#### Exhibit 1: EEG's cash position in AUD and USD terms

	AUD (m)	USD (m) *
Gross Cash	11.20	6.832
Debt	10.94	6.675
Net Cash	0.26	0.160

Source: Company data \* assumes AUD-USD exchange rate of 1.00:0.61

### Near-Neighbour read throughs

In addition, EEG's Beetaloo sub-basin **near-neighbours**, the Santos and Origin JVs in particular, will generate read through results from their regional gas and liquids appraisals. To date, these have been above expectations, justifying further investments, although both JVs are currently suspended by COVID-19 related restrictions.

In particular, the virus shutdown has not dented Origin's enthusiasm for the Beetaloo's potential. Demonstrating its ongoing commitment to its Beetaloo investments, on 7 April Origin announced that it had agreed to purchase an additional 7.5% of its JV partnership with Falcon, lifting its total stake to 77.5% for effective consideration of A\$25m. In addition, it agreed to significantly lift the total investment cap on the Stage II and Stage III work programs from A\$113.3m to A\$263.8m, an increase of A\$150.5m or 133%.

With this latest deal, Origin is effectively valuing the JV tenements and all completed works to date at A\$333m. The company believes that its Beetaloo sub-basin areas potentially holds up to 5 separate plays, including:

- a) middle Velkerri B shale dry gas
- b) middle Velkerri B shale liquids rich gas
- c) Kyalla lower, middle, upper shale dry gas
- d) Kyalla lower, middle, upper shale hybrid liquids rich gas
- e) Hayfield sandstone oil/condensate

Origin is significantly ahead of EEG and Santos in its regional Beetaloo appraisal activities. Origin first struck the farm-in terms with Falcon back in May 2014, completing a 5-well work program in 2016, ahead of announcing a "declaration of discovery" in February 2017 of a 6.6tcf contingent gas resource within the Middle Velkerri B Shale pool across the tenements EP76, EP98 and EP117, representing 4.6m acres/18,500sq km. The JV also reported elevated C3, C4 and C5 liquid hydrocarbon readings from its first horizontally

drilled well targeting the Lower Kyalla shale formation, indicating a gross thickness of 900m. Origin is hopeful the Velkerri and Kyalla hydrocarbon plays may be stacked.

### Shoring up US debt covenants

EEG has acted quickly to secure full financial covenant waivers from its US business lender, until the end of this year, agreeing to provide an extra principal repayment of US\$0.6875m as an offset and in addition to its scheduled 31 March quarterly repayment of US\$0.1375m. This has reduced EEG's USD-denominated debt to US\$6.675m. The US\$0.825m principal repayment was met by existing USD cash balances.

As part of the debt facility, EEG's 2020 Appalachian gas production is 80%-hedged at US\$2.50/mmBtu for the remainder of 2020, a significant premium to current spot prices, trading in the USD\$1.50-1.70/mmBtu range. On the cost side, well-head lifting expenses range ~US\$1.20-1.30/mmbtu, allowing adequate cash margin coverage.

Further option hedging, which we estimate amounts to 25-55% of production, set at the same floor price of \$2.50/mmbtu, has been taken out until end-2023, providing additional downside protection.

Period	Floor Price	Premium	Volume (mmbtu)
Jan 20 - Dec 20	\$ 2.50	\$0.23	1,440,000
Jan 21 - Dec 21	\$ 2.50	\$0.23-\$0.37	600,000
Jan 22 - Dec 22	\$ 2.50	\$0.23-\$0.35	300,000

Source: Empire Energy 2019 Annual Report

Note: EEG's March quarterly report is expected to provide an updated hedge profile to end-2023.

### NT Beetaloo work program deferral

EEG has deferred drilling at its **key future value driver**, the advancement of its Beetaloo basin shale appraisals.

The Stage 1 Work Program is to focus on vertical drilling of the Carpentaria-1 well on its EP187 tenement. The timing of planned drilling remains uncertain due to Covid19 travel and activity restrictions NT authorities suggest EEG may gain an exemption from cross-border restrictions, given that its work searching for additional gas energy sources is an "essential service".

We also note that EEG's **vertical well approvals are valid for 2 years**, offering additional comfort that any timing slippage to its Carpentaria-1 drill plans will not require fresh approvals from the NT Government.

We forecast the drilling and appraisal costs for the Carpentaria-1 vertical appraisal work will cost around A\$7m. This will leave EEG with ~A\$4m in cash to cover contingencies and corporate expenses. The timing of the expenditure on Carpentaria-1 is dependent on the COVID-19 developments.

EEG has also engaged Netherland Sewell & Associates, a Dallas-based energy-consultancy, to develop an **independent prospective resource report**. This should be available for release during 2Q 2020 and may **prove an additional positive event driver**. The Company's existing Prospective Resource P(50) of ~12.4 Tcfe was last updated in October 2016, displaying an average shale thickness of 100m and covering an area of 5.5m/14.5m acres of EEG's total tenement position, primarily based on work undertaken on EEG's EP184 tenement in 2014.

We also expect EEG to continue with its baseline environment testing obligations, particularly water table data collection and analysis, in order to be able to comply with the NT's strict fractured stimulation environmental management requirements, following the lifting of the drilling moratorium in 2018.

### Short-term financing looks ok, but...

On a headline basis, the company looks adequately financed through the next 12-months or so, but this will be dependent on the length of time related to the shut-down and a revision of costs prior to drilling activity resuming.

We consider EEG has a number of future potential funding sources:

- a) A Farm-Out partnership
- b) Additional equity raising
- c) An asset sale of EEG's US Appalachian conventional gas/oil assets across Pennsylvania and New York State, where the company is the second-largest regional gas supplier.
- d) The exercise of unlisted options

We anticipate that decisions on additional equity financing or a farm-out relationship will emerge once the Carpentaria-1 vertical well appraisal details are known, likely during 4Q20.

#### US Asset Sale – dependent on improving domestic gas prices

Given recent excess US onshore natural gas storage inventory levels, we expect domestic Henry Hub gas prices will take some time to recover from 25-year lows.

A recovery in prices could potentially give EEG the option of **an asset sale**. The business is valued in EEG's 2019 Annual report at ~US\$8m on a PV10 (*NPV 10% discount factor*) proved-developed-producing (PDP) basis. We have it in our valuation at A\$10m (US\$6.4m).

Given the added drop-off in industrial demand instigated by COVID-19 shutdowns, we suspect US gas inventories will need to settle back in a 1,000-1,200 bcf range before gas prices gather the necessary market support to rally consistently above US\$2/mmbtu.

#### Unlisted Options: in-the-money at 30 cents

EEG also has ~57.43m unlisted options exercisable at share prices of A\$0.30, \$0.32 and \$0.60 over various periods through until 30 December 2022. These options could raise a further ~A\$11.5m for EEG's coffers in 2020; ~A\$4.6m in 2021 and ~A\$2.2m in 2022, assuming EEG's share price rallies back to its pre-COVID-19 trading level and beyond.

Exhibit 3: EEG unlisted option details				
Date	Option Class	Issued No	Exercise price A\$	Gross Cash Value A\$
31/07/2020	Unlisted	1,000,000	0.32	320,000
26/09/2020	Unlisted	36,775,004	0.30	11,032,501
26/10/2020	Unlisted	600,000	0.30	180,000
30/12/2021	Unlisted	600,000	0.30	180,000
30/12/2021	Unlisted	1,300,000	0.30	390,000
30/12/2021	Unlisted	300,000	0.30	90,000
30/12/2021	Unlisted	300,000	0.30	90,000
31/12/2021	Unlisted	12,000,000	0.32	3,840,000
30/12/2022	Unlisted	1,700,000	0.30	510,000
30/12/2022	Unlisted	2,800,000	0.60	1,680,000

Source: Company data

**Exhibit 4: Financial Summary**

<b>EMPIRE ENERGY GROUP LTD</b>			<b>EEG</b>			
YEAR END			Dec			
<b>NAV</b>	<b>A\$mn</b>	<b>\$0.51</b>				
SHARE PRICE	A\$cps	0.18	Last price 14-Apr			
MARKET CAP	A\$mn	47				
ORDINARY SHARES	M	263				
OPTIONS	M	54				
<b>COMMODITY ASSUMPTIONS</b>						
		2018	2019	2020E	2021E	
Realised oil price	US\$/b	59.86	59.76	36.90	39.16	
Realised gas price	US\$/mcf	3.24	2.72	2.49	2.36	
Exchange Rate	A\$:US\$	0.7452	0.6958	0.6389	0.6290	
<b>EARNINGS</b>						
	US\$000s	2018	2019	2020E	2021E	
Revenue		6,593	5,397	4,656	4,407	
Cost of sales		(4,723)	(4,189)	(3,305)	(3,325)	
<b>Gross Profit</b>		<b>1,870</b>	<b>1,208</b>	<b>1,352</b>	<b>1,082</b>	
Other revenue						
Other income		2,192	155	200	200	
Exploration written off		0	0	0	0	
Finance costs		(801)	(637)	135	45	
Impairment		0	(6,512)	0	0	
Other expenses		(8,399)	(6,052)	(4,950)	(4,985)	
<b>Profit before tax</b>		<b>(5,138)</b>	<b>(11,838)</b>	<b>(3,263)</b>	<b>(3,658)</b>	
Taxes		(115)	(135)	0	0	
<b>NPAT Reported</b>		<b>(5,254)</b>	<b>(11,973)</b>	<b>(3,263)</b>	<b>(3,658)</b>	
Loss on discontinued operations		(10,714)	(4,102)	0	0	
<b>NPAT Underlying</b>		<b>(15,968)</b>	<b>(16,075)</b>	<b>(3,263)</b>	<b>(3,658)</b>	
<b>CASHFLOW</b>						
	US\$000s	2018	2019	2020E	2021E	
<b>Operational Cash Flow</b>		<b>2,828</b>	<b>1,267</b>	<b>117</b>	<b>450</b>	
Net Interest		(2,974)	(1,885)	135	45	
Taxes Paid						
Other		(115)	(135)	(30)	(30)	
<b>Net Operating Cashflow</b>		<b>(261)</b>	<b>(753)</b>	<b>222</b>	<b>465</b>	
Exploration		0	0	(1,278)	(3,774)	
PP&E		(49)	0	0	0	
Petroleum Assets		(168)	(1,848)	0	0	
Net Asset Sales/other		359	20,008	(472)	(715)	
<b>Net Investing Cashflow</b>		<b>(120)</b>	<b>17,407</b>	<b>(1,528)</b>	<b>(4,024)</b>	
Dividends Paid		0	0	0	0	
Net Debt Drawdown		(7,878)	(18,497)	(2,148)	(1,893)	
Equity Issues/(Buyback)		11,677	8,037	0	0	
Other		0	0	0	0	
<b>Net Financing Cashflow</b>		<b>3,785</b>	<b>(10,693)</b>	<b>(2,148)</b>	<b>(1,893)</b>	
<b>Net Change in Cash</b>		<b>3,404</b>	<b>5,961</b>	<b>(3,454)</b>	<b>(5,452)</b>	
<b>BALANCE SHEET</b>						
	US\$000s	2018	2019	2020E	2021E	
Cash & Equivalents		4,157	9,882	6,429	977	
PP&E & Development		31,241	26,633	25,704	29,928	
Exploration		0	141	127	114	
Other Assets		28,673	2,993	991	1,495	
<b>Total Assets</b>		<b>64,071</b>	<b>39,650</b>	<b>33,251</b>	<b>32,515</b>	
Debt		24,369	6,481	4,883	2,990	
Other Liabilities		18,332	19,504	20,846	25,212	
<b>Total Liabilities</b>		<b>42,701</b>	<b>25,985</b>	<b>25,729</b>	<b>28,202</b>	
<b>Net Assets/Shareholders Equity</b>		<b>21,370</b>	<b>13,665</b>	<b>7,522</b>	<b>4,313</b>	
Net Cash/(Debt)		(20,211)	3,401	1,546	(2,013)	
Gearing dn/(dn+e)		-33%				
nm = not meaningful						
na = not applicable						
<b>NET PRODUCTION</b>						
		2018	2019	2020E	2021E	
Crude Oil	kb	127	89	3	3	
Nat Gas	mmcf	1,834	1,778	1,748	1,731	
<b>TOTAL</b>	<b>kboe</b>	<b>432</b>	<b>385</b>	<b>294</b>	<b>291</b>	
<b>RESOURCES and RESERVES</b>						
		Prospective Resources				
		P90	P50	P10		
<b>Northern Territory</b>						
<b>Gas</b>						
Barney Creek Fm	Bcf	3,304	8,699	20,172		
Velkerri Fm	Bcf	383	1,192	3,086		
Woogorang Fm	Bcf	524	1,185	2,371		
<b>TOTAL</b>		<b>4,211</b>	<b>11,076</b>	<b>25,629</b>		
<b>Oil</b>						
Barney Creek Fm	Mb	66	174	403		
Velkerri Fm	Mb	8	24	62		
Woogorang Fm	Mb	10	24	47		
<b>TOTAL</b>		<b>84</b>	<b>222</b>	<b>512</b>		
		1P	2P	3P		
<b>US</b>						
<b>Gas</b>	Bcf	24.3	34.4	38.2		
<b>EQUITY VALUATION</b>						
	Risked Range (In A\$M)			Risked Range Per Share (A\$)		
<b>NT</b>	<b>Low</b>	<b>Mid</b>	<b>High</b>	<b>Low</b>	<b>Mid</b>	<b>High</b>
Gas	\$60	\$90	\$202	\$0.23	\$0.34	\$0.77
Oil	\$22	\$33	\$74	\$0.08	\$0.13	\$0.28
<b>US Onshore</b>						
Appalachian	\$5	\$10	\$15	\$0.02	\$0.04	\$0.06
	<b>\$87</b>	<b>\$133</b>	<b>\$292</b>	<b>\$0.33</b>	<b>\$0.51</b>	<b>\$1.11</b>
Net cash/(debt)	\$5	\$5	\$5			
Corporate costs	(\$5)	(\$5)	(\$5)			
<b>TOTAL</b>	<b>\$87</b>	<b>\$133</b>	<b>\$292</b>	<b>\$0.33</b>	<b>\$0.51</b>	<b>\$1.11</b>
<b>RATIO ANALYSIS</b>						
		2018	2019	2020E	2021E	
Shares Outstanding	M	2313	263	263	263	
EPS (pre sig items)	UScps	(1.05)	(6.46)	(1.24)	(1.39)	
EPS	Acps	(1.41)	(9.29)	(1.95)	(2.22)	
PER	x	na	na	na	na	
OCFPS	Acps	(0.15)	(4.12)	1.32	2.82	
CFR	x	na	na	na	na	
DPS	Acps					
Dividend Yield	%					
BVPS	Acps	1.2	7.5	4.5	2.6	
Price/Book	x	14.5x	2.4x	4.0x	6.9x	
ROE	%		na	na	na	
ROA	%		na	na	na	
(Trailing) Debt/Cash	x					
Interest Cover	x					
Gross Profit/share	Acps		6.6	8.1	6.6	
<b>EBITDAX</b>	<b>ASM</b>	<b>2.3</b>	<b>0.6</b>	<b>(2.0)</b>	<b>(2.3)</b>	

Source: RaaS Advisory



# FINANCIAL SERVICES GUIDE

RaaS Advisory Pty Ltd

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Corporate Authorised Representative, number 1248415

of

BR SECURITIES AUSTRALIA PTY LTD

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AFSL 456663

Effective Date: 26<sup>th</sup> November 2018

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