

# Tlou Energy Limited (ASX: TOU, AIM: TLOU, BSE: TLOU)

Botswana CBM, solar PV and hydrogen

## Overview

Tlou is developing gas-to-power, solar photovoltaic (PV) and green hydrogen projects to meet the energy shortfall in southern Africa, backed by ~430 bcf of 3P coal bed methane (CBM) reserves and some of the world's best solar potential. We expect construction of the Lesedi power project in Botswana to commence shortly, with existing approvals for 20 MW of gas and solar PV generation. The 10 MW power purchase agreement (PPA) with the Government of Botswana provides the foundation for development, with later expansion likely. We value Tlou at \$0.24/sh, with upside to \$0.36 on further derisking of its gas-to-power, solar and hydrogen projects.

## Key points

**Investment thesis:** Tlou offers exposure to 427 bcf 3P and 214 bcf of 2C contingent resources at its Lesedi and Mamba projects in central Botswana, with a further 8 tcf of prospective resources. The 3P reserves and 2C resources can supply 300+ MW of generation for 20 years, helping address Botswana's existing 600 MW power deficit. Tlou's hybrid gas and solar PV project provides supply security and reduced carbon emissions.

**Existing approvals and PPA:** Tlou's mining licence covers CBM production and 20 MW of gas and 20MW solar power generation until August 2042 and a 25 MW transmission line grid connection. Its initial 10MW PPA has potential to expand to ~100 MW of new generation, and gas supply to the existing 90 MW Orapa power station provides further optionality.

**Hybrid gas/solar generation:** Teaming gas-fired generation with solar PV will provide up to 20 MW of dependable output, with solar meeting daytime demand and gas covering shoulder and nighttime requirements. Planning continues for construction, with commencement awaiting finalization of project finance; Tlou notes negotiations for \$US10m from a Botswana fund are well advanced. Power production should commence 1 year later.

**Hydrogen production:** Tlou is examining hydrogen production via pyrolysis of CBM with technology developer Synergen Met. The first prototype is expected to commence field trials at Lesedi in 1H 2022, producing hydrogen and solid carbon with near zero CO<sub>2</sub> emissions. The hydrogen can be used for power generation and transport fuels, with carbon potentially supplying the carbon black market, for tyre manufacture and coating applications.

**Next steps/price catalysts:** Conclusion of project finance arrangements (4Q21), FID for construction of 100 km 66 kV transmission and initial 2 MW gas fired power generation using gas engines (1H22), demonstration of increased CBM well flowrates (1H22), hydrogen prototype trials (1H22), solar PV project (2H22), first power sales (1H23), expansion to 10 MW.

**Risks:** (1) project finance/new equity to fund the initial gas and solar power project, (2) demonstration of CBM well performance and drilling cost reduction to achieve commercial outcomes. We estimate Tlou will require \$10-15m of debt and equity in 2022 to commence the initial 2 MW of capacity, with support from existing shareholders likely.

## SHARE PRICE PERFORMANCE



Closing price as of 21<sup>st</sup> Oct 2021

CAPITALIZATION	
Last price	\$0.055
52-week range	\$0.035-0.105
Capitalization	\$33m
Cash: 30 <sup>th</sup> Jun	\$6.4m
Debt: 30 <sup>th</sup> Jun	nil
EV	\$27m
Shares	600.2m
Options/rights	57.5m
Conv Notes	-
Balance date	June
RESERVES AND PRODUCTION	
1P	0.3 bcf
2P	41 bcf
3P	427 bcf
2C/3C	214/3043 bcf
2U	8596 bcf
FY21a	0 bcf
FY22e	0 bcf
SHAREHOLDERS (%)	
Board/mgt	7.9
Substantial	17.7
Other	74.4
LEADERSHIP	
Chair	Martin McIver
MD/CEO	Tony Gilby
FD/CFO	Colm Cloonan
ED	Gabaake Gabaake
NED	Hugh Swire

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# 1. Financial summary

	Units	FY21a	FY22e	FY23e	FY24e	FY25e	FY26e		Units	FY21a	FY22e	FY23e	FY24e	FY25e	FY26e
<b>CPI, forex &amp; prices</b>								<b>P&amp;L</b>							
US inflation rate	% pa	2.20	2.20	2.20	2.20	2.20	2.20	Sales revenue	M\$A	-	-	0	3	10	17
Australian inflation rate	% pa	2.50	2.50	2.50	2.50	2.50	2.50	Other revenue		0	-	-	-	-	-
Inflation Factor - US : Dec-20	-	1.005	1.028	1.050	1.073	1.097	1.121	Production costs		-	-	-0	-0	-1	-1
\$US/\$A forex (base)	\$US/\$A	0.75	0.70	0.70	0.70	0.70	0.70	Royalties & prod purchases		-	-	-0	-0	-0	-1
Brent	\$US/bbl	54	72	67	64	64	66	Admin		-2	-2	-2	-2	-2	-2
Nat Gas (Henry Hub)	\$US/mmBtu	2.8	3.3	3.0	2.9	3.0	3.1	Other		0	-	-	-	-	-
Nat Gas (Sth Africa) - wholesale	\$US/mmBtu	7.1	8.2	8.0	8.0	8.0	8.3	<b>EBITDA</b>		<b>-1</b>	<b>-2</b>	<b>-2</b>	<b>1</b>	<b>7</b>	<b>13</b>
<b>Received prices</b>								<b>EBIT</b>							
Oil	\$US/bbl	-	-	-	-	-	-	Deprec & Amort		-1	-	-0	-1	-3	-6
Condensate	\$US/bbl	-	-	-	-	-	-	<b>EBIT</b>		<b>-2</b>	<b>-2</b>	<b>-2</b>	<b>-0</b>	<b>4</b>	<b>7</b>
Gas	\$US/mmBtu	-	-	-	-	-	-	Net Interest Expense		0	-3	-5	-7	-10	-8
LPG	\$US/bbl	-	-	-	-	-	-	<b>EBT</b>		<b>-2</b>	<b>-5</b>	<b>-7</b>	<b>-7</b>	<b>-6</b>	<b>-1</b>
LNG	\$US/t	-	-	-	-	-	-	Tax expense		-	2	2	2	17	1
Electricity	\$US/MWh	-	-	-	103.4	102.5	98.6	Minorities / preferred dividends		-	-	-	-	-	-
CO2e	\$US/t	-	-	-	-	-	-	<b>Normalized NPAT</b>		<b>-2</b>	<b>-4</b>	<b>-5</b>	<b>-5</b>	<b>10</b>	<b>-0</b>
Total	\$US/boe	-	-	-	<b>69.0</b>	<b>65.3</b>	<b>69.6</b>	Abnormals		-	-	-	-	127	-
<b>Net production by project</b>								<b>Reported NPAT</b>							
Lesedi: 2->10 MW	mmboe	-	-	0.00	0.03	0.10	0.12	Effective tax rate	%	0.0	30.0	30.2	32.3	261.1	88.7
Lesedi: 10->20 MW	mmboe	-	-	-	-	0.01	0.06	<b>Cash flow</b>							
-	mmboe	-	-	-	-	-	-	<b>EBITDA</b>							
Power to Orapa (90 MW)	mmboe	-	-	-	-	-	-	Change in work cap		-	-	-	-	-	-
Remaining 2P* (50 MW)	mmboe	-	-	-	-	-	-	Deferred tax		-	-	-	-	-	-
Delta 3P vs 2P (220 MW)	mmboe	-	-	-	-	-	-	Other operating items (tax, etc)		0	-3	-4	-6	-22	-10
-	mmboe	-	-	-	-	-	-	<b>Operating cash flow</b>		<b>-1</b>	<b>-5</b>	<b>-6</b>	<b>-5</b>	<b>-15</b>	<b>3</b>
-	mmboe	-	-	-	-	-	-	PPE capex		-0	-8	-10	-5	-3	-8
-	mmboe	-	-	-	-	-	-	Exploration capex		-1	-	-	-	-	-
-	mmboe	-	-	-	-	-	-	Development capex		-	-	-6	-15	-19	-31
-	mmboe	-	-	-	-	-	-	Other investing items		-	-	-	-	-	181
-	mmboe	-	-	-	-	-	-	<b>Investing cash flow</b>		<b>-1</b>	<b>-8</b>	<b>-16</b>	<b>-21</b>	<b>159</b>	<b>-39</b>
Total	mmboe	-	-	<b>0.00</b>	<b>0.03</b>	<b>0.11</b>	<b>0.17</b>	Inc/(Dec) in Equity		7	7	14	-	-	-
<b>Net production by product</b>								<b>Inc/(Dec) in Borrowings</b>							
Oil	mmbbl	-	-	-	-	-	-	Dividends paid		-	-	-	-	-	-
Condensate	mmbbl	-	-	-	-	-	-	Other financing items		0	-0	0	-	-	-
Gas	PJ	-	-	-	-	-	-	<b>Financing Cash Flow</b>		<b>7</b>	<b>14</b>	<b>28</b>	<b>24</b>	<b>20</b>	<b>-8</b>
LPG	mmbbl	-	-	-	-	-	-	<b>Net Inc/(Dec) in Cash</b>		<b>5</b>	<b>1</b>	<b>6</b>	<b>-1</b>	<b>165</b>	<b>-44</b>
LNG	Mt	-	-	-	-	-	-	<b>Free cash flow</b>		<b>-2</b>	<b>-12</b>	<b>-22</b>	<b>-26</b>	<b>144</b>	<b>-36</b>
Electricity	TWh	-	-	-	0.02	0.07	0.12	<b>Balance sheet</b>							
CO2e	Mt	-	-	-	-	-	-	<b>Cash &amp; cash equivalents</b>							
Total	mmboe	-	-	-	<b>0.03</b>	<b>0.11</b>	<b>0.17</b>	Other current assets (DTA)		0	18	20	21	1	2
Total production	kboed	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.08</b>	<b>0.30</b>	<b>0.47</b>	PPE, Exp & Dev		50	58	75	97	117	153
Production growth	%	-	-	-	-	267.7	54.5	Intangible assets		-	-	-	-	-	-
<b>Revenue</b>								<b>Other non-current assets</b>							
Oil	M\$A	-	-	-	-	-	-	Total Assets		57	84	110	132	297	289
Condensate	M\$A	-	-	-	-	-	-	Short term debt		-	-	4	8	8	8
Gas	M\$A	-	-	-	-	-	-	Other current liabilities (DTL)		0	0	0	0	5	0
LPG	M\$A	-	-	-	-	-	-	Long term debt		-	10	20	40	61	53
LNG	M\$A	-	-	-	-	-	-	<b>Other non-current liabilities</b>		<b>0</b>	<b>9</b>	<b>11</b>	<b>13</b>	<b>16</b>	<b>21</b>
Electricity	M\$A	-	-	0	3	10	17	Total Liabilities		1	19	35	62	90	82
CO2e	M\$A	-	-	-	-	-	-	Minorities		-	-	-	-	-	-
Total modelled	M\$A	-	-	<b>0</b>	<b>3</b>	<b>10</b>	<b>17</b>	<b>Total shareholders equity (exc mir)</b>		<b>56</b>	<b>65</b>	<b>75</b>	<b>70</b>	<b>207</b>	<b>207</b>
Total reported	M\$A	-	-	-	-	-	-	Total Funds Employed		56	65	75	70	207	207
Revenue growth	%	-	-	-	-	247.0	64.9	Net debt		-6	2	10	36	-109	-73
<b>Operational metrics</b>								<b>Business metrics</b>							
Revenue	\$A/boe	-	-	-	93.2	85.4	88.7	EBITDA margin	%	-	-	-	17.9	68.5	75.6
Production & transport costs	\$A/boe	-	-	-	-7.3	-5.4	-6.3	EBIT margin	%	-	-	-	-	37.0	40.6
Royalties & prod purchases	\$A/boe	-	-	-	-4.0	-3.7	-3.8	Normalized NPAT r	%	-	-	-	-	101.5	-
Admin	\$A/boe	-	-	-	-65.2	-17.8	-11.6	Revenue growth	%	-	-	-	-	243.3	64.1
EBITDA margin	\$A/boe	-	-	-	16.7	58.5	67.0	EBITDA growth	%	-	-	-	-	-	81.1
D&A	\$A/boe	-	-	-	-23.9	-26.9	-31.0	EBIT growth	%	-	-	-	-	-	80.4
Tax and financing	\$A/boe	-	-	-	-141.7	55.1	-36.8	Normalized ROA	%	-3.6	-4.5	-4.4	-3.6	3.5	-0.1
Normalized NPAT	\$A/boe	-	-	-	-149.0	86.6	-0.8	Normalized ROE	%	-3.6	-5.8	-6.4	-6.9	5.1	-0.1
Resource/production		-	-	-	31.1	8.3	5.2	Fully diluted shares (million)		600	852	852	852	852	852
Product mix	% liquids	-	-	-	-	-	-	Wtd diluted shares (million)		372	789	852	852	852	852
<b>Change vs. prior report</b>								<b>Leverage</b>							
USD/AUD (average)	\$US/\$A	-	-	-	-	-	-	Net Debt / Book Ec	%	-11	3	13	51	-53	-35
Brent USD	\$US/bbl	-	-	-	-	-	-	Net Debt / (ND+Bo)	%	-13	3	12	34	-111	-54
Brent AUD	\$A/bbl	-	-	-	-	-	-	Net Debt / Total As	%	-11	2	9	27	-37	-25
Production	mmboe	-	-	-	-	-	-	EBIT Interest cover x		-	-0.6	-0.4	-0.0	0.4	0.8
Revenue	\$m	-	-	-	-	-	-	Debt / Free Cash Fl x		-	-0.8	-1.1	-1.9	0.5	-1.7
Cash opex (-ve = inc.)	\$m	-	-	-	-	-	-	<b>Valuation metrics</b>							
EBITDA	\$m	-	-	-	-	-	-	Norm. EPS	c/sh	-0.6	-0.5	-0.6	-0.6	1.2	-0.0
Normalized NPAT	\$m	-	-	-	-	-	-	EPS growth	%	-	-13	17	0	-318	-101
Cash (YE)	\$m	-	-	-	-	-	-	PER	x	-9.1	-10.5	-8.9	-8.9	4.1	-282.6
Debt (YE, +ve = inc.)	\$m	-	-	-	-	-	-	Op Cash flow	c/sh	-0.4	-0.6	-0.7	-0.6	-1.8	0.3
Capex (+ve = inc.)	\$m	-	-	-	-	-	-	Price/Op Cash	x	-13.1	-8.2	-7.5	-8.5	-2.8	15.6
								EV/EBITDA	x	-	-	-	-	-	-

Source: company data and K1 Capital forecasts

\$A currency unless otherwise noted. Nominal \$ basis. Year ending June.

## 2. Valuation

We have valued Tlou using discounted cash flow analysis for the Lesedi gas and power projects backed by reserves and 2C contingent resources and applied enterprise value to resource multiples for 3C resources and exploration prospects. Our resource multiples are based on analogous projects cross-checked with market metrics. We apply risk factors to account for technical and commercial maturity. Our valuation cases are summarized below.

Table 1 Valuation cases

Case	Description	\$m	\$/sh
<b>Base</b>	<p><u>Gas and solar pilot:</u></p> <ul style="list-style-type: none"> <li>▪ Phase 1: Lesedi gas-to-power and solar PV project constructions starts 1H 2022; 2 MW from 2023, expanding to 10 MW from 2024. Mining life extended beyond August 2042. 10 MW solar production. 80% risk factor.</li> <li>▪ Phase 2: Expansion of gas-to-power to 20 MW from 2025 to utilize 25 MW grid connection installed in Phase 1. 70% risk.</li> </ul> <p><u>Phased full field development:</u></p> <ul style="list-style-type: none"> <li>▪ Phase 3: Field development and 90 MW OCGT power generation at Lesedi from 2028 to replace Orapa diesel fired generation<sup>1</sup>. Alternatively, construction of ~150 km gas pipeline to Orapa to convert existing 90 MW diesel power. 50% risk factor. FID Jan 2026</li> <li>▪ Phase 4: Development of remaining 2P reserves and 80% of 2C contingent resources expected to convert to 2P, ~50 MW power generation. Assume \$US1.3m/MW. FID Jan 2028</li> <li>▪ Phase 5: Development of 3P reserves, sufficient for ~220 MW power generation. 20% risk factor. FID Jan 2030</li> <li>▪ 70% sell down of Lesedi/Mamba at end FY25 prior to Phase 3 FID to fund full field development, 30% retained interest.</li> </ul> <p><u>Development assumptions:</u></p> <ul style="list-style-type: none"> <li>▪ Average power selling prices &gt;\$US90/MWh (\$US25/MMBtu) per BPC annual report. Gas sales at 75% of diesel import parity price (\$US60/bbl Brent long run + \$US15/bbl ADO crack + assumed \$US5/bbl freight) to provide switching incentive (=&gt; \$US13.80/MMBtu ADO, \$US10.30/MMBtu gas).</li> <li>▪ 0.25 bcf estimated ultimate recovery (EUR) per dual lateral well pod, with peak production of 150-200 kscfd/pod after 2 years. \$US0.5m/pod capital cost.</li> <li>▪ Risked exploration value for undeveloped 3C and prospective gas resources, incorporating expected time value discount.</li> </ul> <p><u>Green hydrogen/carbon project</u></p> <ul style="list-style-type: none"> <li>▪ Nominal \$1m value assigned to Synergen hydrogen/carbon JV. Upside possible following technology validation.</li> </ul>	<b>202</b>	<b>0.24</b>
<b>Bear</b>	<ul style="list-style-type: none"> <li>▪ As for Base, but no value for 3C and prospective resources.</li> </ul>	121	0.14
<b>Bull</b>	<ul style="list-style-type: none"> <li>▪ As for Base, with Phases 1 to 4 fully derisked.</li> </ul>	307	0.36

Source: K1 Capital analysis. Share prices based on diluted share count of 852.4m shares (current share count = 600.2m).

<sup>1</sup> N.b. Orapa 90 MW OCGT diesel/gas power station constructed in 2011. Conversion from diesel to gas may not be warranted by 2028 due to limited remaining service life.

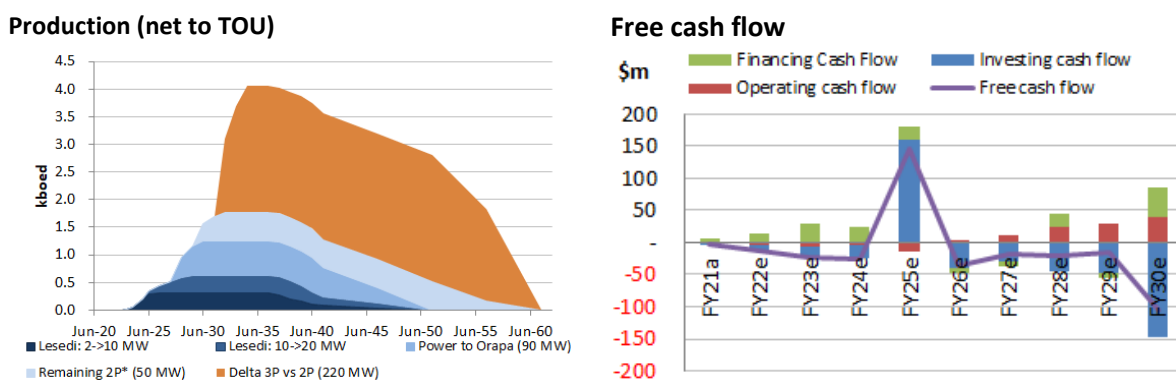
Table 2 Base case valuation summary

NPV @ 10.0% WACC+country factor	Net volume	NPV value	Risk factor	Equity change	Riskd value	Riskd value	Unriskd value	Project WACC	Riskd value
Valuation as of 30 Jun 2021	PJe	\$/GJ	%	MSA	MSA	\$/sh	\$/sh	%	\$/sh
<b>Projects (DCF model valuation)</b>	<b>187.7</b>			<b>69</b>	<b>115</b>	<b>0.13</b>	<b>0.25</b>		
Lesedi: 2->10 MW	10.8	0.65	80	-	6	0.01	0.01	10.3	
Lesedi: 10->20 MW	10.8	1.53	70	-	12	0.01	0.02	10.3	
Power to Orapa (90 MW)	21.7	1.20	50	31	44	0.05	0.08	10.3	
Remaining 2P* (50 MW)	27.0	0.49	40	13	18	0.02	0.04	10.3	
Delta 3P vs 2P (220 MW)	117.3	0.43	20	25	35	0.04	0.10	10.3	
<b>Exploration / Appraisal</b>	<b>3,593.6</b>				<b>80</b>	<b>0.09</b>	<b>1.29</b>		
Delta 3C resources	899.9	0.42	10	-	38	0.04	0.45		
Karoo prospective resources	2,693.7	0.27	5	-	35	0.04	0.83		
-	-	-	-	-	-	-	-		
Solar PV (10 MW)	-	-	80	-	6	0.01	0.01		
Synergen JV hydrogen/carbon	-	-	20	-	1	0.00	0.00		
<b>Other (corporate, cash, debt, etc)</b>					<b>7</b>	<b>0.01</b>	<b>0.01</b>		
Corporate costs					-18	-0.02	-0.02		
Cash					6	0.01	0.01		
Additional Equity					18	0.02	0.02		
Debt					-	-	-		
<b>Equity Valuation @ base case</b>					<b>202</b>	<b>0.240</b>	<b>1.54</b>		
<b>Mkt Cap @ current share price</b>	(and undiluted share count)				<b>30</b>	<b>0.050</b>			
Number of shares (undiluted)	000,000				600.2 @ valuation date				
Number of shares (diluted)	000,000				852.4 fully funded devel't				

Source: K1 Capital analysis. Assumes long run forex = \$US0.70/\$A.

- Includes \$7m of additional equity in H1 2022 and \$10m in 2023 to progress exploration, appraisal and staged development before operations can be internally funded. Assumes existing 57.5m options exercised H2 2022.
- Equity change is the estimated NPV associated with partial sell down from 100% to 30% prior to full field development. Cash received, which will be used to help fund Flou's equity share of development, will be higher.
- Sell down is assumed to occur at the project's riskd NPV, hence the riskd value is unchanged by sell down. The unriskd value is reduced due to lower equity interest in future project derisking.
- Production volumes assume the mining licence is extended beyond August 2042. Net volumes assume 30% retained interest across all licences.
- NPV/GJ for exploration/appraisal projects has been adjusted to reflect the expected time to commercialization.

Figure 1 Base case production and near-term cash flow



Source: K1 Capital analysis. Production assumes mining lease extended beyond Aug. Positive investing cash flow in FY25 are associated with assumed partial sell-down of Lesedi/Mamba project prior to full field development.

## 3. Botswana energy market

### 3.1.1 Background

Natural gas consumption in Botswana is currently zero. Power demand of ~600 MW is met by ~260 MW of largely coal fired generation and 340 MW of imports, predominantly from South Africa. Installed generation capacity of 892 MW (732 MW coal, 160 MW diesel) operates well below capacity due to operational issues. Electricity demand is expected to increase to ~1184-1359 MW by 2030, met by 649 MW of local generation, but still requiring 525-710 MW of imports [1]. The government hopes that ~30% of generation (195 MW) by 2030 will come from renewables.

The US Agency for International Developments (USAID) estimates that gas demand may increase to 18 PJ/yr by 2030, driven by new markets in gas power generation (5 PJ), industry (10 PJ) and transport (3 PJ)<sup>2</sup>. The small domestic supply and limited demand are unlikely to justify cross-border gas pipelines and hence the gas market is likely to develop initially as a standalone market. However, exports of gas or power to South Africa could be possible in the longer term.

The Botswana Power Corporation (BPC) is the dominant organization in generation, transmission, and distribution, comprising 87% of generation and 100% of transmission and distribution. IPPs comprise 11% of generation, with own users accounting for the balance. IPPs sell their power to the BPC.

### 3.1.2 Gas to power projects

The Botswana Ministry of Energy has planned several gas-to-power projects based on the development of CBM resources, inviting Tlou and Sekaname (i.e. Kalahari Energy) to respond to a request for proposal to develop the first 100 MW gas-to-power project. Projects include:

- Lesedi project (Tlou): 10 MW project, with potential later expansion to 50 MW.
- Mmashoro project (Kalahari Energy), initially scoped at 180 MW but later reduced to 100 MW.
- Orapa Diesel Plant Conversion: existing 90 MW diesel fueled OCGT plant commissioned in 2011.
- Matselagabedi Diesel Plant Conversion: 105 MW diesel-fueled emergency plant in Francistown, commissioned in 2009. Viability in question due to age of plant; unlikely to proceed.

USAID estimates converting the diesel fired Orapa peaking power station<sup>3</sup> to gas will require ~200 bcf gas, based on an OCGT plant operating at 70% utilization with a thermal efficiency of 31% for 30 years ( $100 \text{ MW} * 3600 \text{ s/h} * 24 \text{ h/d} * 365 \text{ d/y} * 70\% * 30 \text{ y} / 31\% = 213 \text{ PJ}$ ; ~7 PJ/y).

### 3.1.3 Renewables

Botswana has significant solar potential, with >3,200 hours of sunshine per year and average global irradiation of 21 MJ/m<sup>2</sup>/day, one of the highest levels in the world. The government has expressed interest in establishing a 100 MW PV solar plant and or a 100 MW Concentrated Solar Thermal Plant (CSTP). Low average wind speeds of 2.0 to 3.5 m/s are not attractive for large-scale wind power development, and low and uneven rainfall indicates hydro power is not a viable option. This means that solar power will need to be backed by gas generation or large-scale battery storage to provide supply continuity.

<sup>2</sup> 18 PJ/yr is equivalent to 177 MWe at 31% efficiency assumed by USAID: 5 PJ/yr => 50 MWe at 31%.

<sup>3</sup> Orapa consists of two 45 MW GE LM6000 Sprint Simple Cycle gas turbines, currently running on diesel. These machines have an efficiency of 40.8% lhv basis [11]. The USAID report assumes 100 MW, with 31% efficiency.

## 4. CBM project overview

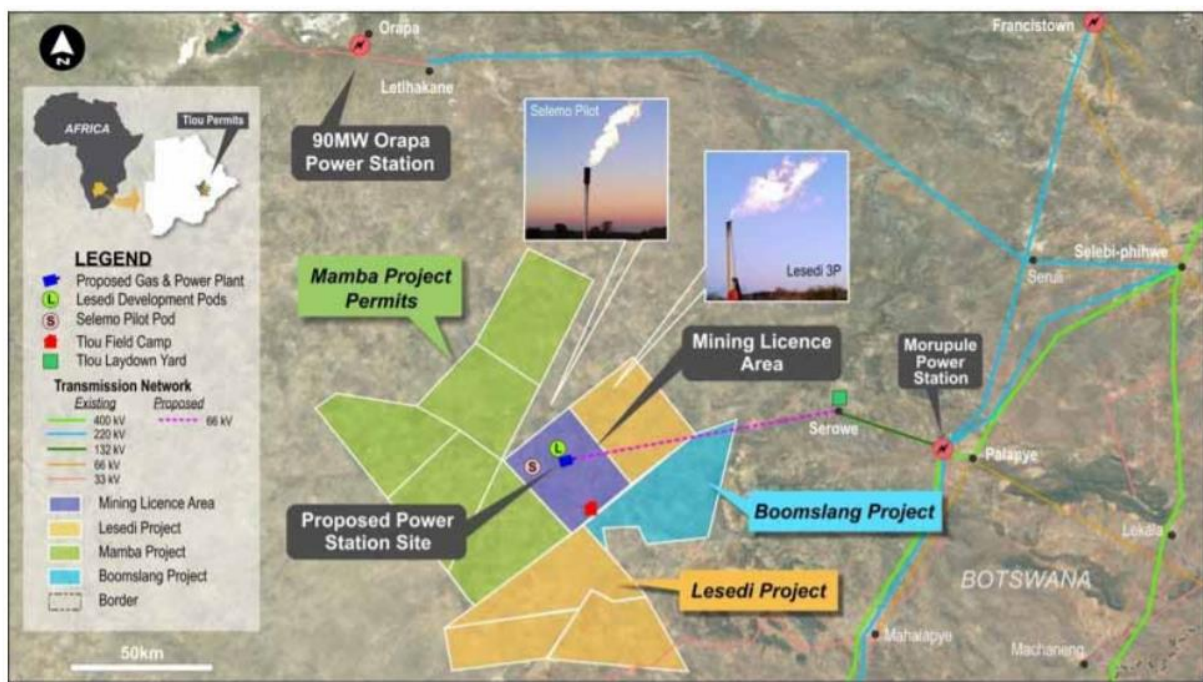
### 4.1.1 Exploration areas

Tlou entered Botswana in 2009 by farming into licences owned by Saber Energy Group, a subsidiary of TSX-listed Talon Metals Corp. Saber had acquired ~12,500km<sup>2</sup> of CBM prospecting licenses in 2007 and drilled ~90 coreholes and chipholes over the next two years. Tlou drilled 10 exploration coreholes as part of its farm in and acquired Saber Energy in 2010.

Tlou now has three project areas in Botswana:

- **Lesedi Project:** This CBM and solar appraisal project is the most advanced of Tlou's project and is the location of the proposed power development, central processing facility and solar farm. The project consists of four Prospecting Licences (PL's) and a Mining Licence (ML), with a total area of ~3,800 km<sup>2</sup>. The mining licence is valid until 2042; the PLs are renewed every two years.
- **Mamba Project:** This is a CBM exploration and evaluation project, consisting of five PLs covering ~4,500 km<sup>2</sup> has independently certified gas resources. Additional exploration drilling is planned.
- **Boomslang Project:** This CBM exploration and Evaluation area, consisting of one PL covering ~1,000 km<sup>2</sup>, is on-trend with Lesedi project. Environmental approval, expected in 2022, is required before exploration can commence.

Figure 2 Tlou Energy gas production and power generation



Source: Tlou Energy Limited, "Emerging Power Producer", 15<sup>th</sup> June 2020, p 10

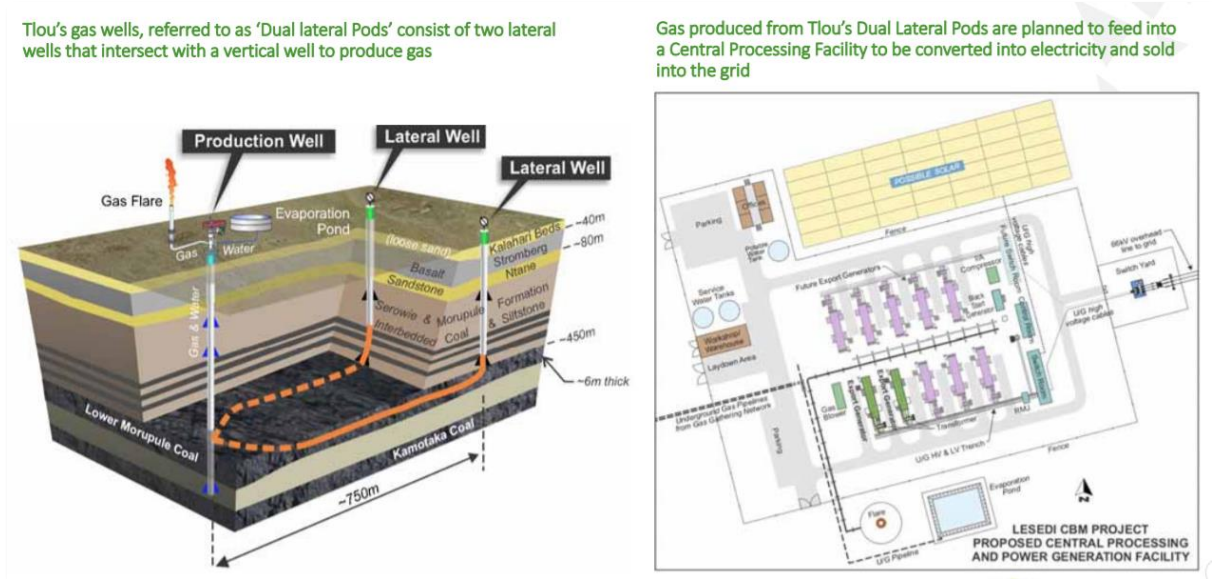
### 4.1.2 Lesedi project

Progress has been slower than initially expected, however, the project now has environmental approval for a 20 MW gas and 20 MW solar development, the initial Power Purchase Agreement (PPA) negotiated with Botswana Power Corporation (BPC) for 2MW has recently expanded to 10 MW (announced 19<sup>th</sup> October 2021), and a generation licence has been approved by the Botswana Energy Regulatory Authority (BERA) for both gas and solar production.

The gas and solar project involves constructing a 100 km 25 MW 66kV transmission line to connect the Lesedi project to the grid at Serowe, installing initially 2 MWe of generation assets (expanding to 10 MWe), then drilling additional wells to supply up to 10 MWe of power, with later possible expansion to 100 MWe. CBM produced water will be evaporated in surface posts or used for local agriculture or aquaculture.

The tender for the transmission line has been awarded. Project finance negotiations with a Botswana based fund are at an advanced stage.

Figure 3 Tlou Energy gas to power project



Source: Tlou Energy Limited, “Emerging Power Producer”, 15<sup>th</sup> June 2020, p 15.

4.1.3 Resource quality

The Lesedi area is prospective for CBM, based on information contained in Tlou’s 2013 IPO prospectus. Well performance, in terms of flow rates and estimated ultimate recovery, is yet to be determined.

Table 3 CBM quality

Item	Comment
Depth (m)	~300-700 m.
Gas content (m3/t)	Average ~4 m3/t, with some areas above 5m <sup>3</sup> /t (DAF basis). No well-defined trend was observable in respect of gas content with depth.
Net thickness (m)	~25 m and up to 35 m in places. Adjacent and interbedded shale reservoirs could add an additional 20-30m
Permeability (mD)	2.0-5.0 mD unstimulated average perm, based on drill stem tests (DST)
Gas saturation (%)	65-95%. Gas saturation appears to decrease with depth.
Gas composition (%)	Excellent, most samples ranging from 75-100% methane.

Source: K1 Capital compilation of company data from Tlou Energy Limited, “Prospectus”, 2013. Data based on 11 validated coreholes with over 2.5 km of core, over 250 desorption samples, and 1000+ CBM laboratory tests

#### 4.1.4 Gas to power project economics

Tlou Energy is proceeding at 100% interest to develop the gas to power plant in 1 MW stages to reduce risk and manage capex requirements. Next steps involve the construction of the transmission line and initial generation assets, while progressing remaining solar approvals.

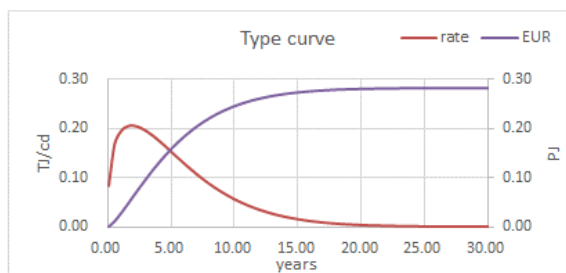
Limited project data are available on well productivity, capex and operating costs. Our key assumptions and results are summarized below.

Table 4 Lesedi gas to power project assumptions

Assumption	Comment
Resource density	1.0-1.5 bcf/km <sup>2</sup> 2P, per US EIA study for USA analogue. 0.99 MMBtu/kscf hhv [2]
Well spacing	150 m * 750 m lateral => 11.25 Ha/well; 2 laterals/pod => 60 acres/pod
EUR	=> 8.9 wells/km <sup>2</sup> => 140 MMscf/well; 280 MMscf/pod
Peak rate	150-200 kscf/pod after 24 months, per K1 Capital estimate
Well life	15 years (guestimate)
Gen. efficiency	40.1%, per Clarke Energy, Jenbacher Type 3 gas engine, 50 Hz, new [2]
Gen. capacity	10 MWe PPA (2 MW initial capacity), possible expansion to 100 MW
Fuel gas/day	2 MWe*3.6*24/40% efficiency = 432 GJ/day => 414 kscfd => 2-3 pods initially
Fuel gas/year	432 GJ/day * 365 d/yr * 91% service factor = 143 TJ/yr
Project life	20 years, 15 years at plateau => ~3.2 PJ over project life (assume 67% at plateau)
Well count	~11-12 pods over project life
Capital cost	Wells: \$US1.0m/pod; cost expected to reduce to \$US0.5 with experience. Gas gathering: \$0.2m/pod Generation: \$US0.4m/MWe (2 <sup>nd</sup> hand gen sets). c.f. new ~\$US1m/MW. Other: Allow \$US1m for buildings/connection to transmission. [4] Transmission/sub-stations: \$US9m for 100 km 25 MW 66 kV Decommissioning: allow 10%
Opex	O&M: 2% new capex = \$US2m*0.02=\$US60k/yr => \$US0.42/GJ
Project life	Construction = 1 yr, production = 20 years (15 years at plateau)
Royalties	3% government. 2.00 ZAR/kscf to previous owner (Sekaname) for first 10 MW project
Tax rate	22%, per PwC [2]
Discount rate	10% nominal. Political risk of 0.3%, assuming one third of country risk from Damodaran [6]. Inflation = 2.0% pa.
Power price	\$US90/MWh per BPC <sup>4</sup> (This is equivalent to a fuel price of \$US8.70/GJ at 40% eff., assuming no losses, etc.)
<b>Results</b>	Phase 1 (2 MW->10 MW)
NPV after tax	\$US7m
IRR after tax	12.7%
Payback	14 years

Source: K1 Capital analysis

Figure 4 Assumed type curve



Source: K1 Capital

<sup>4</sup> We estimate the diesel fuel price at \$US60/bbl Brent long run is ~\$US80/bbl (\$US15/bbl crack + assumed \$US5/bbl freight); equivalent to \$US13.80/GJ. This implies the fuel price for power at Orapa is \$US124/MWh at 40% efficiency. BPC reports average power costs for Botswana have exceeded average selling prices since 2011.

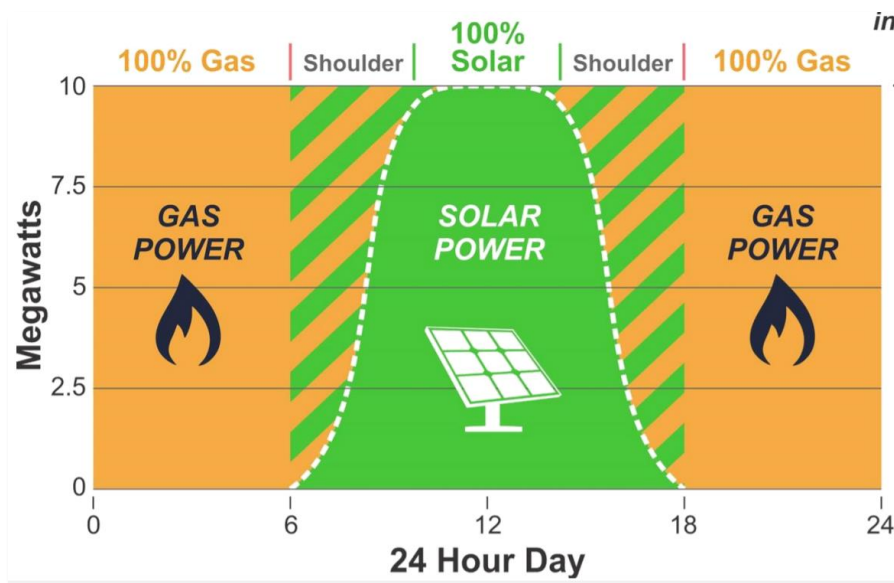


## 5. Solar PV project

Tlou has environmental approval for 20 MW of gas fired power and 20 MW of solar PV generation, and environmental approval for a 25 MW 66 kV transmission line grid connection. The Lesedi site has abundant land for solar expansion. Gas fired generation offers the ability to load follow solar PV for predictable output and grid stability. First electricity sales are expected ~12 months from transmission line commencement. Infrastructure will be scalable to 25 MW, limited by the transmission line.

We believe the hybrid gas/solar model has merit and our analysis indicates the solar PV project is economic on a standalone basis. The inclusion of battery storage is a possible future enhancement.

Figure 5 Tlou's hybrid gas and solar power model



Source: Tlou Energy, "Tlou's Gas and Solar Power Solution", 29<sup>th</sup> April 2020, p 8

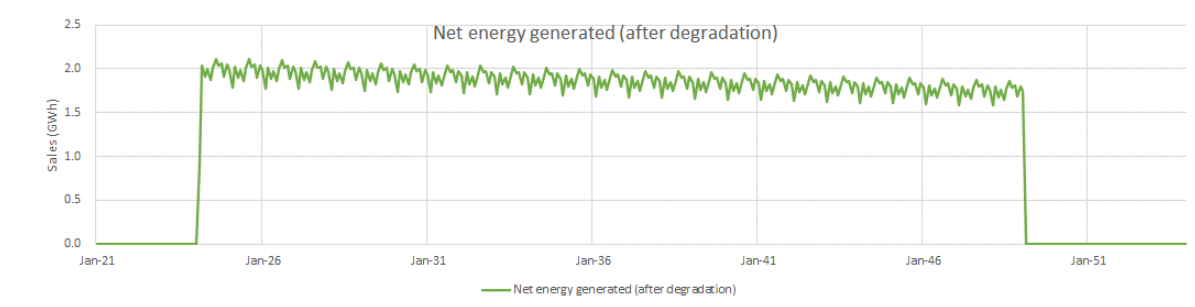
Table 5 Tlou solar PV project assumptions

Assumption	Comment
Resource density	Average daily irradiation (inclined) 21.7 MJ/m <sup>2</sup> /day. Peak irradiance 943 W/m <sup>2</sup>
Array type	Fixed, 26° tilt. Monocrystalline, efficiency 20.2%. 0.5%pa decline
Capacity	10 MWe peak, 2.7 MWe average (24 hr day, full year). Average/peak = 27%.
Project life	~19 years (limited by ML expiry August 2042)
Capital cost	Panels: \$US0.7m/MW, all-in, including inverters, etc. Transmission: use existing 66 kV line. Decommissioning: 10%
Opex	\$US10/kW/yr
Royalties	nil
Tax rate	22%
Discount rate	10% nominal. Country risk of 0.3%. Inflation = 2.0% pa.
Power price	\$US90/MWh
<b>Results</b>	
NPV after tax	\$US5m (unrisked), 80% risk factor => \$A6m risked
IRR after tax	19%
Payback	Nominal = 6.2 years; discounted = 8.4 years
Profitability Index	(1+NPV/PV capex) = 1.84

Source: K1 Capital analysis

Table 6 Estimated solar power generation profile

Serowe, Botswana		Units	Total	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
© K1 Capital Pty Ltd 2021				1	2	3	4	5	6	7	8	9	10	11	12
<b>Gross AC power generated</b>															
	1:00 MW		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	2:00 MW		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	3:00 MW		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	4:00 MW		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	5:00 MW		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	6:00 MW		0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1
	7:00 MW		0.5	0.8	0.5	0.2	0.1	0.0	0.0	0.0	0.0	0.3	0.9	1.3	1.2
	8:00 MW		2.3	2.6	2.2	2.3	2.1	1.9	1.4	1.2	1.6	2.5	3.1	3.3	3.1
	9:00 MW		4.9	4.7	4.4	4.7	4.9	4.8	4.4	4.3	4.7	5.3	5.6	5.4	5.3
	10:00 MW		7.0	6.4	6.2	6.8	7.2	7.2	6.8	6.8	7.3	7.5	7.6	7.0	7.0
	11:00 MW		8.4	7.6	7.5	8.2	8.7	8.7	8.3	8.4	9.0	9.0	8.9	8.2	8.3
	12:00 MW		9.1	8.3	8.3	9.0	9.3	9.4	9.1	9.5	10.0	9.6	9.3	8.6	8.8
	13:00 MW		9.1	8.4	8.5	9.1	9.0	9.4	9.2	9.7	10.1	9.5	9.0	8.5	8.6
	14:00 MW		8.3	7.9	8.0	8.3	8.0	8.5	8.6	9.2	9.3	8.7	8.1	7.5	7.9
	15:00 MW		7.1	6.9	7.1	7.2	6.8	7.2	7.2	7.8	7.9	7.3	6.6	6.2	6.6
	16:00 MW		5.2	5.4	5.5	5.5	4.9	5.0	5.2	5.7	5.7	5.2	4.6	4.5	5.0
	17:00 MW		2.8	3.5	3.6	3.4	2.5	2.1	2.3	2.6	2.7	2.7	2.3	2.5	3.0
	18:00 MW		0.7	1.6	1.6	1.2	0.3	0.1	0.1	0.1	0.2	0.4	0.5	0.8	1.3
	19:00 MW		0.1	0.3	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.2
	20:00 MW		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	21:00 MW		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	22:00 MW		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	23:00 MW		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0:00 MW		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
<b>Total solar power generated</b>		<b>MW</b>	<b>2.7</b>	<b>2.7</b>	<b>2.6</b>	<b>2.7</b>	<b>2.6</b>	<b>2.7</b>	<b>2.6</b>	<b>2.7</b>	<b>2.9</b>	<b>2.8</b>	<b>2.8</b>	<b>2.7</b>	<b>2.8</b>



Source: K1 Capital analysis, solar data based on Johannesburg (nearest publicly available information)  
Fixed array at 26° tilt, performance adjusted for estimated cell temperature and operational degradation with time

## 6. Hydrogen

Tlou announced a Heads of Agreement with Synergen Met Pty Ltd on 30<sup>th</sup> July 2021 for a prototype hydrogen and solid carbon capture project to be installed at the Lesedi project<sup>5</sup>. Synergen uses plasma technology to convert methane to hydrogen and solid carbon via methane pyrolysis. The process is CO<sub>2</sub> neutral. The key points of the agreement are:

1. Synergen previously built a plasma prototype to produce sodium cyanide for an operating mine in Tasmania in 2014<sup>6</sup>. We understand no further units have yet been commercialized<sup>7</sup>.
2. Work has commenced on the detailed design of the prototype to produce hydrogen and solid carbon from CBM based on lessons learned from earlier designs by Synergen Met. The prototype will be constructed and tested in Queensland prior to deploying it at Tlou's Lesedi Project in 1Q22. The project can be undertaken within Tlou's existing approvals.

<sup>5</sup> Synergen Met agreed a term sheet with ASX-listed Pure Hydrogen in April 2021 for a similar prototype to be installed at its Project Venus CSG project in Queensland in 2H2022.

<sup>6</sup> L. Henderson, P. Shukla, V. Rudolph and G. Duckworth, "Production of Cyanide Using Thermal Plasma: Thermodynamic Analysis and Process-Specific Energy Consumption", Ind. Eng. Chem. Res. 2020, 59, 21347–21358

<sup>7</sup> Reports indicate Synergen expected to install more than thirty 450-750 tpa units per year from 2017. Only one 60 tpa prototype has been installed, at the Henty gold mine in western Tasmania.

3. Assuming the prototype is successful Tlou and Synergen will seek to grow a clean energy business via joint venture throughout the Southern African Development Community (SADC) region.
4. The HOA also contemplates Tlou’s potential participation in Synergen’s proposed initial public offering (IPO), currently scheduled for later this year.
5. Potential benefits for Tlou include utilizing gas that is currently being flared, developing a new market for its CBM in conjunction with a technology partner, and diversifying Tlou’s product range.
6. In-house costs will be covered separately by Tlou and Synergen, while third party costs will be shared on a 50:50 basis. Tlou will supply the input gas and electricity for the prototype at no cost to Synergen. A gas price will be negotiation for later expansion. Synergen will retain ownership of the plasma technology and associated IP. Hydrogen and carbon products will be owned 50:50.

Synergen’s process involves producing hydrogen and solid carbon via a high temperature plasma torch. The torch is powered by electricity, which will be sourced initially from diesel generated power and from on-site solar power in the longer term. The hydrogen will be used as fuel to produce electricity in the short term or compressed for use as a clean vehicle fuel. The solid carbon will be exported by road for use in carbon black or upgraded to synthetic graphite for use in batteries.

Synergen indicates the modular skid unit technology should produce up to 1,350 kg of hydrogen per day (~450 tpa at 91% service factor). We estimate this will require ~270 kscfd gas (~0.1 PJ/y), producing ~4.0 t/day of solid carbon. The price received for carbon will have a significant bearing on project economics, given three times as much carbon is produced as hydrogen.

We believe Synergen’s technology is likely to work, given existing applications from other companies. However, we think it will be some years before commercial operation is achieved<sup>8</sup>. Our preliminary discounted cash flow analysis indicates acceptable returns will require low natural gas prices, ready access to hydrogen and carbon black markets and the availability of large-scale renewable energy. These factors are unlikely to be present in Botswana in the near-term future but may develop in time.

Table 7 Example methane plasma pyrolysis projects

Project	Karbomont	Seaport	Olive Creek 1	Olive Creek 2	Synergen Met
Owner	Kvaerner	Monolith	Monolith	Monolith	Synergen
Location	Canada	California	Nebraska	Nebraska	Botswana
Commissioned	1999	2014	2020	2023 planned	2022 planned
Status	Shutdown	-	In operation	In const’n	In develop’t
Purpose	Commercial	Demonstrat’n	Commercial	Commercial	Prototype
Carbon black (ktpa)	20	0.7	14	180	1.3
Hydrogen (ktpa)	6.7	0.2	4.7	60	0.45
H2 reactor (kg/h)	400	20	600	600	56
No. of reactors (-)	2	2	3	12	1
Service factor (%)	~95	~67%	~89	~95	~91
Capex (k\$US/tpa H <sub>2</sub> )			21.3	16.7	
Power (MWh/t H <sub>2</sub> )				33	

Source: K1 Capital analysis of public information [6] [7] [8] [9] [10]. Service factors estimated by K1 Capital. Other projects by Hazer Group (ASX: HZR, iron based catalytic (TDCM) producing graphite); Woodman Point biogas to hydrogen (cofunding from ARENA, WA Govt, 280 kg H<sub>2</sub>/d (fuel cell quality) and 1100 kg C/d graphite (Arena, 2019); Eden Innovations (ASX: EDE, US based, UQ developed process), with a focus on carbon nanotubes and materials applications.

<sup>8</sup> Monolith spent over 3,700 hours of demonstration plant operation over three years to improve yield, reliability, quality control and scale up before being ready to undertake its OC1 project. This was for technology that had already been employed in a commercial setting for over a decade. Commercial application of Synergen’s NaCN technology is still to be achieved, six years after initial prototype deployment.

## 7. Comparative valuation

In addition to Tlou, three ASX-listed companies have onshore CBM or unconventional gas interests in southern Africa: Kinetiko Energy (ASX: KKO) – CBM in South Africa, Pure Hydrogen (ASX: PH2) – CBM in Botswana, and Renergen (ASX: RLT) – biogenic gas and helium in South Africa. Botala Energy, JV partner with Pure Hydrogen in Botswana, is expected to list shortly. Kalahari Energy (unlisted; CBM in Botswana), is also active. Approximately seven ASX-listed junior to mid-size companies have CBM interests in Australia, with only one, Senex (ASX: SXY), in production.

Tlou trades at a discount to most ASX peers with international operations, probably due to uncertainty regarding commercialization of its large contingent resource endowment. Successful demonstration of production from its initial 2 MW gas-to-power project should see this discount begin to unwind.

The trading metrics of each company, along with three mid-cap ASX-listed diversified producers for comparison, are summarized below. Our primary valuation metric for CBM companies is 2P reserves + 0.8\*2C resources, based our analysis of industry long run resource to reserves conversion, which indicates that ~80% of 2C resources are converted to 2P reserves over a period of 5 years.

Table 8 Reserve and resource trading metrics

Company	Code	Last Price 21-Oct-21	Total Shares (million)	Mkt Cap M\$A	EV M\$A	2P PJe'	3P PJe'	2C PJe'	EV/2P \$/A/GJe	EV/ (2P+0.8*2C) \$/A/GJe	EV/ (3P+2C) \$/A/GJe	Gearing D/(D+E) %
Tlou Energy	TOU	0.055	600	33	27	53.0	556.5	278.9	0.50	0.10	0.03	-
<b>Australian CBM (6)</b>				<b>477</b>	<b>464</b>	<b>256.5</b>	<b>618.3</b>	<b>5,449.2</b>	<b>1.81</b>	<b>0.10</b>	<b>0.08</b>	<b>5</b>
Blue Energy	BLU	0.057	1,327	76	74	71.0	298.0	1,166.0	1.04	0.07	0.05	-
Comet Ridge	COI	0.135	791	107	131	185.5	320.3	352.8	0.71	0.28	0.19	21
Carbon Minerals	CRM	0.330	19	6	3	-	-	183.0	-	0.02	0.02	-
Galilee Energy	GLL	0.460	295	136	118	-	-	3,011.5	-	0.05	0.04	-
State Gas	GAS	0.305	173	53	50	-	-	217.0	-	0.29	0.23	-
Pure Hydrogen	PH2	0.310	321	100	89	-	-	518.9	-	0.22	0.17	-
<b>ASX International CBM/helium (6)</b>				<b>805</b>	<b>793</b>	<b>349.3</b>	<b>642.3</b>	<b>4,020.7</b>	<b>2.27</b>	<b>0.22</b>	<b>0.17</b>	<b>5</b>
Elixir Energy	EXR	0.300	891	267	235	-	-	-	-	-	-	-
Kinetiko Energy	KKO	0.095	588	56	55	-	-	2,463.3	-	0.03	0.02	0
NuEnergy Gas	NGY	0.030	1,481	44	46	65.7	65.7	37.5	0.70	0.48	0.44	7
Pure Hydrogen	PH2	0.310	321	100	89	-	-	518.9	-	0.22	0.17	-
Renergen	RLT	2.380	118	280	318	283.7	576.6	1,001.1	1.12	0.29	0.20	13
Talon Petroleum	TPD	0.010	5,856	59	49	-	-	-	-	-	-	-
<b>ASX oil &amp; gas producers (3)</b>				<b>4,567</b>	<b>4,716</b>	<b>3,587.4</b>	<b>1,417.2</b>	<b>1,534.7</b>	<b>1.31</b>	<b>0.98</b>	<b>0.92</b>	<b>9</b>
Beach Energy	BPT	1.435	2,281	3,274	3,322	2,531.9	-	1,291.7	1.31	0.93	0.87	5
Cooper Energy	COE	0.290	1,631	473	600	316.4	422.3	243.0	1.90	1.17	0.90	32
Senex Energy	SXY	4.470	184	820	794	739.1	994.9	-	1.07	1.07	0.80	8

Source: K1 Capital analysis of company data. Expressed relative to the spot east coast Australian gas price of \$8.85/GJ. Senex subject to possible takeover from POSCO International, announced 18<sup>th</sup> October 2021.

Table 9 Reserve & resource spot price equivalence factors

Commodity	units	Price 21-Oct-21	Price \$/US/boe	Price factor	Source
USD/AUD forex	\$/US/\$A	0.7508	-	-	Reserve Bank of Australia
Brent	\$/US/bbl	84.61	84.61	1.00	Bloomberg
WTI	\$/US/bbl	82.30	82.30	0.97	"
Henry Hub	\$/US/mmBtu	5.19	30.10	0.36	"
EC Australia	\$/A/GJ	8.85	40.66	0.48	AEMO Wallumbilla benchmark 1 Oct '21
WC Australia	\$/A/GJ	5.25	24.12	0.29	gasTrading spot price Sep '21
Europe	\$/US/mmBtu	22.84	132.47	1.57	World Bank, Netherlands TTF, Sep '21
LNG	\$/US/mmBtu	12.40	71.92	0.85	85% of Brent (14.7% slope)
LNG JPN/KOR spot	\$/US/mmBtu	13.87	80.45	0.95	World Bank, Japan, Aug '21
SAfrica	\$/US/mmBtu	8.84	51.25	0.61	est. field gate price @ \$US84 Brent
LPG	\$/US/t	798	69.96	0.83	Saudi Contract Price - Oct '21
Helium	\$/US/kscf	210	1,183	13.98	USGS Mineral Comm Summary 2020

Source: K1 Capital analysis. Helium "boe energy equivalent price" assumes notional 1.03 MMBtu/kscf for comparison

**Disclosure:**

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## 9. Appendices

### 9.1 CBM reserves and resources

Table 10 Gross resource statement (n.b. Tlou's share is 100% of the gross amount shown)

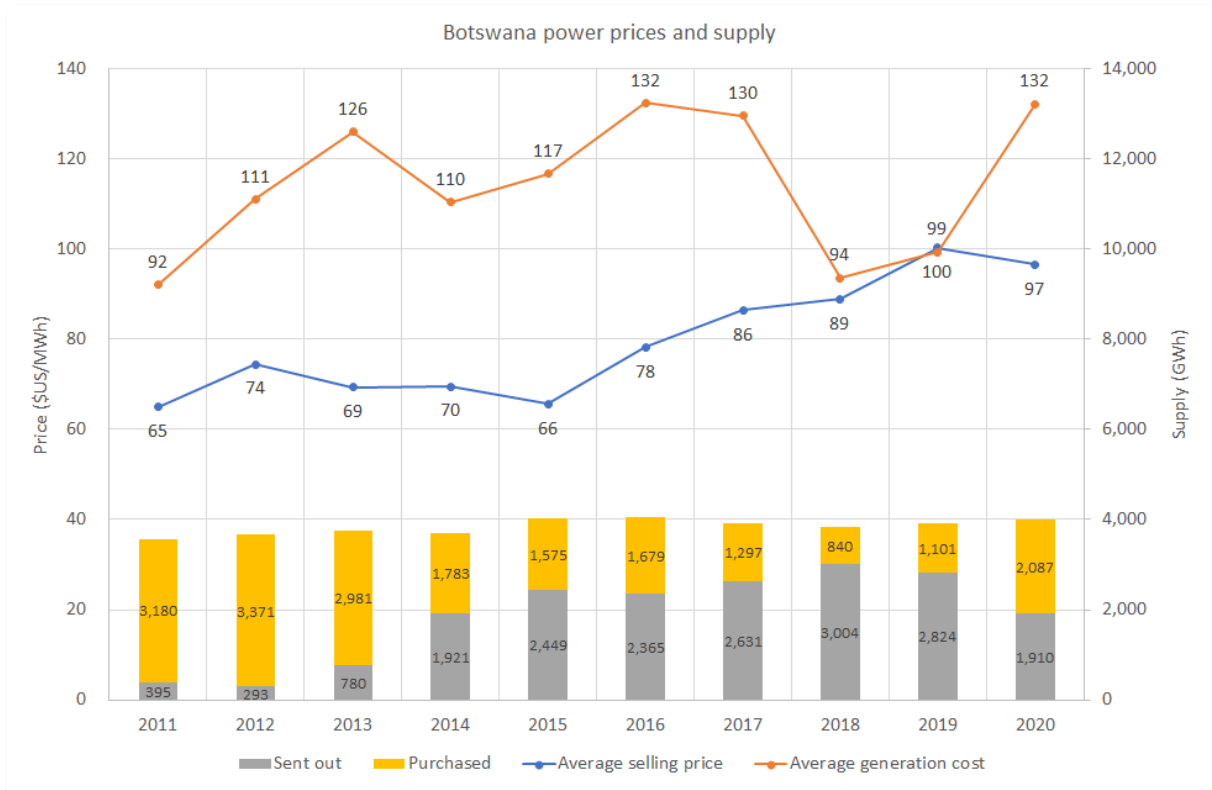
Project	Tlou Interest	1P (BCF)	2P (BCF)	3P (BCF)	1C (BCF)	2C (BCF)	3C (BCF)
Lesedi and Mamba (all coal seams)	100%	<1	41	427	5	214	3,043

Tlou 100% interest - 31 December 2017									
Location	Project	Tlou Interest	Gas Reserves (BCF) <sup>1</sup>			Gas Contingent Resource (BCF) <sup>2</sup>			Gas Prospective Resource (BCF) <sup>3</sup>
			1P	2P	3P	1C	2C	3C	
Karoo Basin Botswana	Lesedi CBM (Lower Morupule coal) (ML 2017/18L PL001/2004)	100%	0.34	25.2	252	4.6	45.6	331	-
Karoo Basin Botswana	Lesedi CBM (all coal seams) (ML 2017/18L PL001/2004) <sup>4</sup>	100%	0.34	25.2	252	4.6	214	3,043	-
Karoo Basin Botswana	Mamba CBM (Lower Morupule coal (PL238/2014 PL239/2014 PL240/2004 PL241/2014)	100%	0.01	15.5	175	n/a <sup>5</sup>	n/a <sup>5</sup>	n/a <sup>5</sup>	-
Karoo Basin Botswana	PL003/2004, PL035/2000, PL037/2000	100%	-	-	-	-	-	-	8,596 <sup>5</sup>

1. Source: data from Tlou Energy Limited, "Tlou achieves a further material increase in Gas Reserves", 20<sup>th</sup> Feb 2018, based on SRK Consulting (Australasia) Pty Ltd reserves and resource assessment.
2. Development well spacing of 150 m<sup>2</sup> \* 750 m lateral => 11.25 Ha/well = 28 acres/well, per 20<sup>th</sup> Feb 2018.
3. The reserves for the Lesedi Project area have been calculated net of a government royalty of 3% of wellhead revenue and a royalty payable to the previous owner Sekaname Pty Ltd of ZAR2.00 per 1,000 standard cubic feet (SCF) produced at the wellhead or 12.5% of the wellhead selling price of the gas produced (less certain transport and logistical costs), whichever is greater. Only the Government royalty of 3% is applicable to the Mamba Project area.

## 9.2 Botswana power prices

Figure 6 Botswana power prices



Source: K1 Capital analysis; derived data from Botswana Power Corporation, Annual Report 2020, “Key Annual Statistics for the year ended 31<sup>st</sup> March”, p 6 [12]

Figure 7 Botswana Pula (BWP) to USD exchange rate



Source: <https://currencies.zone/chart/botswana-pula/us-dollar>  
 Note: 1 BWP = 100 Thebe



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