AUCTUS ADVISORS

HARTSHEAD RESOURCES NL (ASX: HHR)

June 07, 2022

Share price: A$0.02
Target: A$0.20

Initiating Coverage: Hartshead Resources NL

460-800 bcf shallow water development in UK Southern Gas Basin

Hartshead Resources is a A$40 mm market cap gas company with ~300-850 bcf contingent resources and ~140-720 bcf prospective resources across five licenses in the UK Southern Gas Basin. These resources were left behind when ConocoPhillips decided to decommission key infrastructure on exiting the Southern Gas Basin. Production from the associated fields ceased in 2018 and the licenses returned to the UK government. With soaring gas prices and growing spare capacity in the remaining infrastructure in the region, the economics of a development of these gas pools now look very attractive; especially when developed as part of an aggregation strategy. Hartshead was awarded the license with effect from 1 December 2020. The industry was, at the time, reeling with the unfolding COVID-19 pandemic, oil prices that had briefly turned negative and industry concerns were more about survival rather than new opportunities. The company's next steps are to (1) to take the Phase I development through FEED, (2) secure an industry partner to provide development funding for the project and (3) take FID on the Phase I development. This rerating series of events will unlock the value of the project, effectively replicating what IOG has achieved with CalEnergy Resources (Berkshire Hathaway) at neighboring analog fields. With domestic natural gas production now being a priority for the UK, we believe that there are multiple potential suitors. We have set our target price in line with our ReNAV at A$0.20/sh, representing ~10x the current share price.

Rating & target		Old	New
Target		n.a.	A$ 0.200
Yield			0%
Implied total return			770%

Share data	2020/ 2021	2021/ 2022e	2022/ 2023e
Shares dil., mm	1,985	1,985	1,985
Mkt cap, US$mm	$24	$33	$33
EV, US$mm	$18	$31	$37

Financial Data	2020/ 2021	2021/ 2022e	2022/ 2023e
Gas, mmcf/d	0.0	0.0	0.0
Liquids, bbl/d	0	0	0
Total boe/d (6:1)	0	0	0
CFO, US$mm	($1)	($2)	($7)
Net capex, US$mm	($0)	$1	$0
Net debt, US$mm	($5)	($2)	$4
CFPS dil., US$/shr	($0.00)	($0.00)	($0.00)
EPS dil., US$/shr	($0.00)	($0.00)	($0.00)

Valuation	2020/ 2021	2021/ 2022e	2022/ 2023e
Share price, A$/shr	A$ 0.016	A$ 0.023	A$ 0.023
EV/DACF	n.a.	n.a.	n.a.
EV per boe/d (US$)	n.a.	n.a.	n.a.

Net asset value	
CNAV, A$/shr	A$ 0.148
RENAV, A$/shr	A$ 0.209
Unrisked NAV, A$/shr	A$ 0.362
P/CNAV	0.2x
P/RENAV	0.1x
P/ENAV	0.1x

All figures in US$ unless otherwise noted
A$/US$: 0.74

Phased development to initially reach ~140 mmcf/d production

The first two phases of the project consist of redeveloping fields previously in production. 255-380 bcf will be redeveloped at Anning/Somerville During Phase I, with two unmanned wellhead platforms and six horizontal multi frac wells similar those at the neighboring Clipper South field. Hartshead is negotiating a gas transportation agreement through a host platform with planned delivery to the Bacton Gas Terminal. First gas is expected in late 2024 with 140 mmcf/d production. Phase II will develop a further 50-465 bcf at Hodgkin/Lovelace through the same infrastructure. Phase III comprises nearby exploration with ~145-720 bcf prospective resources.

Value build-up

In 2019, IOG's assets had some similarities to Hartshead's today, with a 2 stage development (~160-280 bcf/~145-325 bcf respectively) and initial production of 145 mmcf/d. CalEnergy acquired 50% of IOG's assets for £40 mm in cash and a net carry for up to £125 mm (£60 mm for phase 1). The sizes of IOG's individual fields are smaller and NBP gas was only ~30p/therm then, a fraction of today's gas price. A similar farm-out transaction for Hartshead would value the assets at A$20-0.30/sh. Our Core NAV for Hartshead assuming a US$100 mm farm-out and 70% chance of development stands at A$0.15/sh. Adding phase II leads to a ReNAV of A$0.21/sh. Phase III would add further value.

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Figure 1. Financial & operating information

Hartshead Resources NL (HHR AU)

Financial & Operating Information		2020/2021a	2021/2022e	2022/2023e	2023/2024e	2024/2025e	2025/2026e
Commodity Prices							
Brent	US$/bbl	$53.55	$89.63	$100.00	$98.75	$82.50	$70.00
NBP	US$/mcf	$7.80	$25.05	$26.25	$15.00	$12.00	$12.00
USD/CAD	US$/C$	$1.35	$1.32	$1.29	$1.36	$1.40	$1.40
A$/US$	A$/US$	$0.74	$0.73	$0.72	$0.72	$0.72	$0.72
Production							
Oil and Liquids	bbl/d	0	0	0	0	0	0
Natural Gas	mmcf/d	0.0	0.0	0.0	0.0	23.9	70.0
Total (6 mcf = 1 boe)	boe/d	0	0	0	0	3,991	11,667
% Oil and Liquids	%	1%	1%	1%	1%	0%	0%
Netbacks							
Realized Price	US$/boe	n.a.	n.a.	n.a.	n.a.	$72.00	$72.00
Royalties	US$/boe	n.a.	n.a.	n.a.	n.a.	$0.00	$0.00
Production & Transport Costs	US$/boe	n.a.	n.a.	n.a.	n.a.	$9.34	$7.86
Operating Netback	US$/boe	n.a.	n.a.	n.a.	n.a.	$62.66	$64.14
Taxes	US$/boe	n.a.	n.a.	n.a.	n.a.	$0.00	$18.10
Cash Flow Netback	US$/boe	n.a.	n.a.	n.a.	n.a.	$62.31	$47.22
Government Take	%	n.a.	n.a.	n.a.	n.a.	0%	25%
Financials							
Cash Flow (CFO)	US$mm	($1)	($2)	($7)	($14)	$81	$192
CFPS - diluted	US$/shr	($0.00)	($0.00)	($0.00)	($0.00)	$0.05	$0.10
EBITDAX [a]	US$mm	($4)	($2)	($3)	($4)	$91	$278
E&D Capex	US$mm	$0	$1	$0	$4	$80	$53
A&D Capex, Net	US$mm	($0)	$0	$0	$0	$0	$0
Total Net Capex	US$mm	($0)	$1	$0	$4	$80	$53
Total Net Capex/CFO	x	0.4x	-0.4x	0.0x	-0.3x	1.0x	0.3x
Leverage							
Net Debt	US$mm	($5)	($2)	$4	$22	$21	($118)
Net debt/CFO (Trailing)	x	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
Entry Net Debt/CFO	x	n.a.	n.a.	n.a.	-0.3x	0.3x	0.1x
Capital Structure							
Basic Shares o/s @ YE	mm	1855	1855	1855	1855	1855	1855
Diluted Shares o/s @ YE	mm	1985	1985	1985	1985	1985	1985
Market Capitalization	US$mm	$24	$33	$33	$33	$33	$33
Enterprise Value	US$mm	$18	$31	$37	$55	$53	($85)
Dividends & Sustainability							
Dividends	US$mm	$0	$0	$0	$0	$0	$0
Dividends	$/shr	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
Dividend Yield	%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Free Cash Flow	US$mm	($1)	($3)	($7)	($18)	$1	$139
Cash Use/CFO	%	41%	-35%	0%	-28%	98%	28%
Performance							
Prod. Per Shr Growth (Y/Y) - dil	%	n.a.	n.a.	n.a.	n.a.	n.a.	192%
PPS Growth (Y/Y) DDA - dil. [b]	%	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
CFPS Growth (Y/Y) - dil.	%	n.a.	n.a.	n.a.	n.a.	n.a.	122%
CFPS Growth (Y/Y) DDA - dil. [b]	%	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
ROCE	%	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
Net Asset Value [c]							
CNAV (Atax) - diluted	A$/shr	A$ 0.148					
RENAV (Atax) - diluted	A$/shr	A$ 0.209					
Unrisked NAV (Atax) - diluted	A$/shr	A$ 0.362					
P/CNAV	x	0.2x					
P/RENAV	x	0.1x					
P/Unrisked NAV	x	0.1x					
Valuation		**2020/2021a**	**2021/2022e**	**2022/2023e**	**2023/2024e**	**2024/2025e**	**2025/2026e**
Share Price, YE/Current	A$/shr	A$ 0.023	A$ 0.023	A$ 0.023	A$ 0.023	A$ 0.023	A$ 0.023
P/CF	x	n.a.	n.a.	n.a.	n.a.	0.5x	0.2x
EV/DACF	x	n.a.	n.a.	n.a.	n.a.	0.4x	-0.3x
Target EV/DACF	x	n.a.	n.a.	n.a.	n.a.	2.4x	0.6x
EV per boe/d	US$/boe/d	n.a.	n.a.	n.a.	n.a.	$13,402	($7,320)
EV per 2P boe	US$/boe	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
EV per 2P boe, with FDC	US$/boe	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.

a) EBITDAX = Pre-Int. & Pre-Tax Cash Flow; b) DDA = Debt-and-Dividend-Adjusted
c) CNAV incl. 2P reserves, RENAV incl. 2P reserves + Risked LT inventory upside, ENAV incl. 2P reserves + Unrisked LT inventory upside
Source: Auctus Advisors, Company Disclosures **Futures strip as of 6-Jun-22

High value gas development opportunity

Overlooked and acquired at a perfect time

The company's principal subsidiary, Hartshead Resources Ltd (Hartshead UK) was incorporated in April 2019 as a SPV to make license application in the UK 32nd Offshore Licensing Round. Hartshead UK reversed into Ansila Energy NL, an ASX listed E&P company in February 2021 to raise A$8 million of new equity. Ansila Energy NL was renamed Hartshead Resources NL shortly afterwards.

Hartshead's strategy is to aggregate enough adjacent stranded shallow water gas discoveries in the Southern Gas Basin in the UK Southern North Sea to reach sufficient scale to make an aggregated development commercially attractive. With the industry paralyzed by the fall out from the COVID-19 pandemic, there was little competition and, in December 2020, the company was awarded blocks 48/15c, 49/6c, 49/11c, 49/12d and 49/17b in a single license; P2607. The blocks hold four satellite fields (Somerville, Anning, Lovelace and Hodgkin) that previously produced a total of >100 bcf as part of very significant developments (some of which started production in the 1970s) that recovered multiple tcfs of natural gas. Production at one of the complexes peaked at 900 mmcf/d.

In 2012 ConocoPhillips experienced major safety incidents with significant releases of gas at the Lincolnshire Offshore Gas Gathering System and ConocoPhillips decided to decommission this major natural gas collection platform. This was a hub for numerous fields and, with the closure of the facilities in 2018, all connected fields ceased production, leaving significant volumes of stranded gas. ConocoPhillips exited the UK three years later by selling its assets to Chrysaor. Only 6% of the initial gas in place has been recovered at Anning while the historical recovery factor at Somerville is only ~11% with only one development well in each discovery.

With declining production in the basin, ullage in existing infrastructure in the area is increasing. With rising domestic gas demand and global supply concerns due to the conflict between Russia and Ukraine, natural gas production has become again strategic for the UK and boosting domestic production has become an absolute priority for the UK government.

Repeating successful development strategies

The successful development of Hartshead's assets will rely on three different important factors.

Firstly, the horizontal wells will be hydraulically stimulated as the Rotliegendes reservoirs are tight. We are comfortable with this risk as fraccing had already been undertaken at Anning and Sommerville with historical individual well IP rates of up to 45 mmcf/d. The existing Sommerville well has recovered 45 bcf alone. The Clipper South field is also developed with similar fracced wells with 185 bcf recovered so far from four production wells. The Babbage and Breagh fields are other examples of fields in the Southern North Sea developed with horizontal fracced wells.

Secondly, access to processing and transportation infrastructure will be critical. With declining production in the basin, there is a growing ullage in the existing infrastructure in the area. With rising gas demand and global supply issues the UK government is likely to prioritize the unlocking of stranded domestic natural gas resources. Negotiations with infrastructure owners have already started and an agreement with an infrastructure owner could be announced soon.

Third is funding. A major step in the project will be taking a Final Investment Decision (FID) to execute the development plan, which requires agreeing commercial terms with the host platform and securing funding. IOG's partnering with a Warren Buffet company, CalEnergy Resources Limited, and the subsequent issue of an £88 mm high yield bond, all while NBP gas prices were at a fraction of current levels, is a blueprint for Hartshead's development plans.

Overview of assets

Hartshead's assets consist of 100% WI in the following assets:

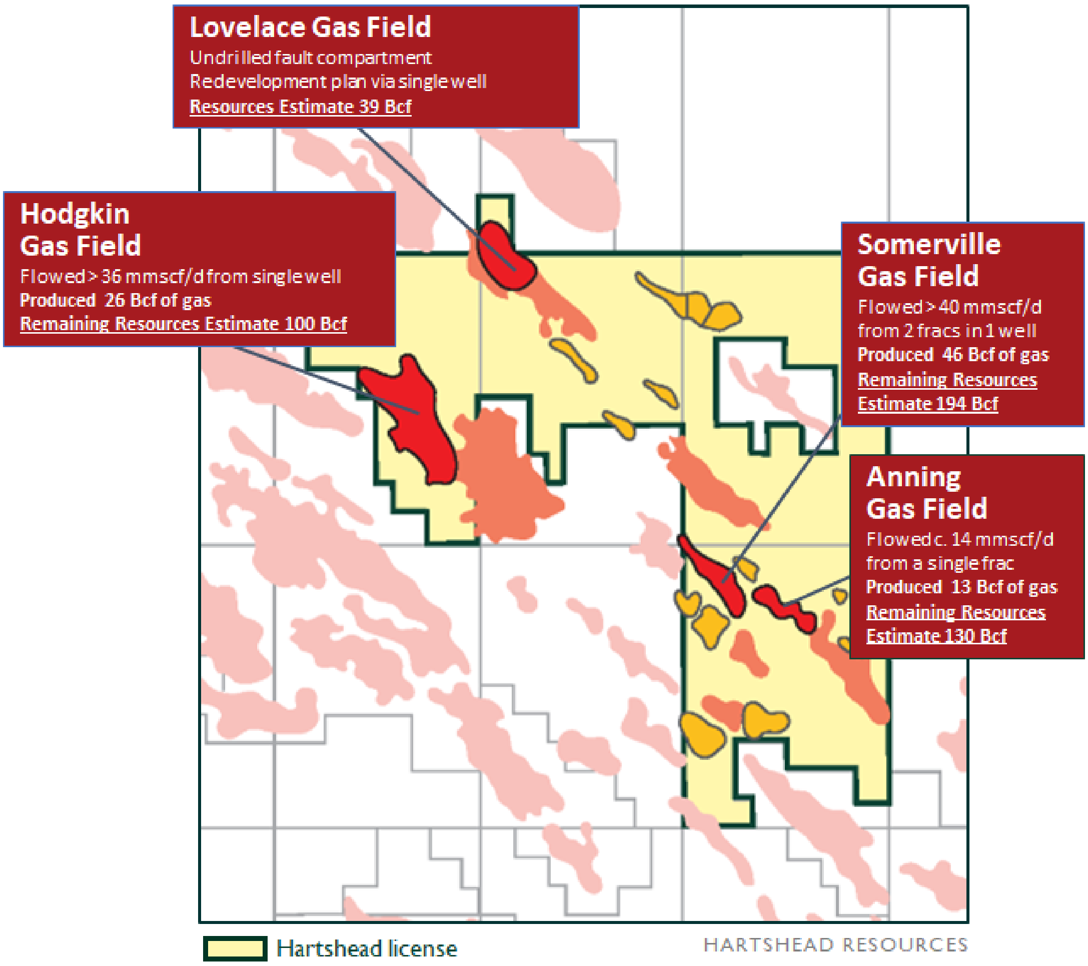
- 130 bcf 2C contingent resources at Anning (formerly Victoria) and 194 bcf 2C contingent at Somerville (formerly Viking Wx). These fields will be developed in the first phase with first gas expected ~YE24 with a production plateau of ~140 mmcf/d,

- 100 bcf 2C contingent resources at Hodgkin (formerly Audrey NW) and 39 bcf contingent resources at Lovelace (formerly Tethys North). These fields will be part of a second phase development tied-back to the infrastructure put in place during the first phase of development.

- 344 bcf 2U prospective resources across 14 nearby exploration prospects with Geological Chance of Success of 32% to 54%. These would be progressed as part of a third phase.

The licence obligations are light. The initial term for the blocks expires in December 2025 with obligations consisting of desktop studies and the drilling of one well. A second term is available for a further four years prior to converting into a 18 year production licence.

Figure 2. Harthead's asset location in the UK Southern Gas Basin



Source: Company

Figure 3. Hartshead's assets and resources

Asset	Discovery/Prospect	Block	WI	Initial period Expiry Date	Gas in Place (bcf)			Contingent Resources (bcf)			Prospective Resources (bcf)			Geological Chance of Success
					P90	P50	P10	1C	2C	3C	1U	2U	3U	%
Somervile	Discovery Phase I	49/17b	100%	Dec-25	376	410	468	160	194	220				100%
Anning	Discovery Phase I	49/17b	100%	Dec-25	176	218	259	95	130	160				100%
Total Phase I								***255***	***324***	***380***				
Lovelace	Discovery Phase II	49/6c/ 49/11c	100%	Dec-25	53	130	239	14	39	79				100%
Hodgkin	Discovery Phase II	48/15c	100%	Dec-25				35	100	387				100%
Total Phase II								***49***	***139***	***466***				
Garrod	Prospect Phase III	49/17b	100%	Dec-25							16	52	125	50%
Ayrton	Prospect Phase III	49/17b	100%	Dec-25							25	74	146	41%
McLaren	Prospect Phase III	49/17b	100%	Dec-25							18	27	39	54%
Stephenson	Prospect Phase III	49/17b	100%	Dec-25							36	47	60	43%
Widdowson East	Prospect Phase III	49/17b	100%	Dec-25							6	29	79	32%
Widdowson Central	Prospect Phase III	49/17b	100%	Dec-25							11	21	40	50%
Lonsdale	Prospect Phase III	49/17b	100%	Dec-25							5	16	31	50%
Anderson	Prospect Phase III	49/17b	100%	Dec-25							5	12	29	45%
Wenlock Prospect 1	Prospect Phase III	49/12d	100%	Dec-25							4	19	55	36%
Wenlock Prospect 2	Prospect Phase III	49/12d	100%	Dec-25							1	5	19	36%
Wenlock Prospect 3	Prospect Phase III	49/11c	100%	Dec-25							1	5	17	36%
FFs Prospect 1	Prospect Phase III	49/11c	100%	Dec-25							3	11	26	41%
FFs Prospect 2	Prospect Phase III	49/11c	100%	Dec-25							8	19	37	35%
FFs Prospect 3	Prospect Phase III	49/11c	100%	Dec-25							4	9	17	34%
Total Phase III											***143***	***346***	***720***	
Total								**304**	**463**	**846**	**143**	**346**	**720**	

Source: Company

Phased development

Hartshead plans to develop its assets in three phases with the first phase supporting the construction of the infrastructure through which production from the subsequent phases will be produced. This results in enhanced economics for the future phases and opens up the potential for nearby exploration. All the fields have 3D seismic coverage.

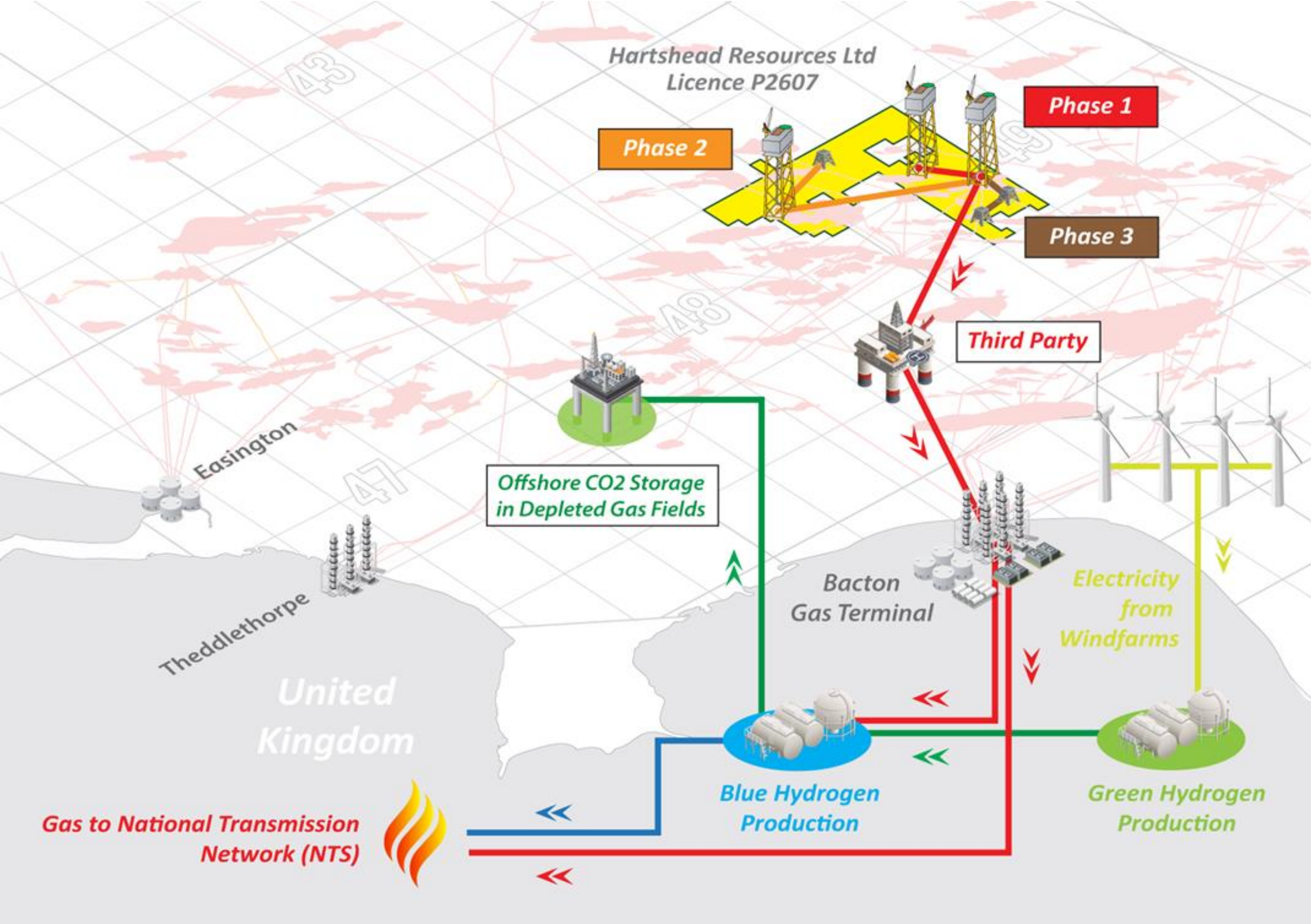
The reservoirs (Permian aged Rotliegendes sandstone) in three of the four fields in the Phase I and Phase II developments are considered tight. However, all the fields have historically produced gas at commercial rates and, by the time production ceased, only very low recovery factors of 6-14% had been achieved. This compares with up to 85% in some gas fields. The contingent resources estimated by the company and the auditors imply only ~45-65% recovery (best case), which continues to be conservative.

Figure 4. Historical and expected recovery factor

	Gas in Place (bcf)			Volumes already recovered (bcf)	Implied historical recovery factor (%)			Contingent Resources (bcf)			Recovery factor implied in contingent resources (%)		
	P90	P50	P10		P90	P50	P10				P90	P50	P10
Phase I													
Somervile	376	410	468	46	12%	11%	10%	160	194	220	55%	59%	57%
Anning	176	218	259	13	7%	6%	5%	95	130	160	61%	66%	67%
Lovelace	53	130	239	18	34%	14%	8%	14	39	79	60%	44%	41%
Hodgkin	n.a.	n.a.	n.a.	26				35	100	387			

Source: Company

Figure 5. Development concept



Source: Company

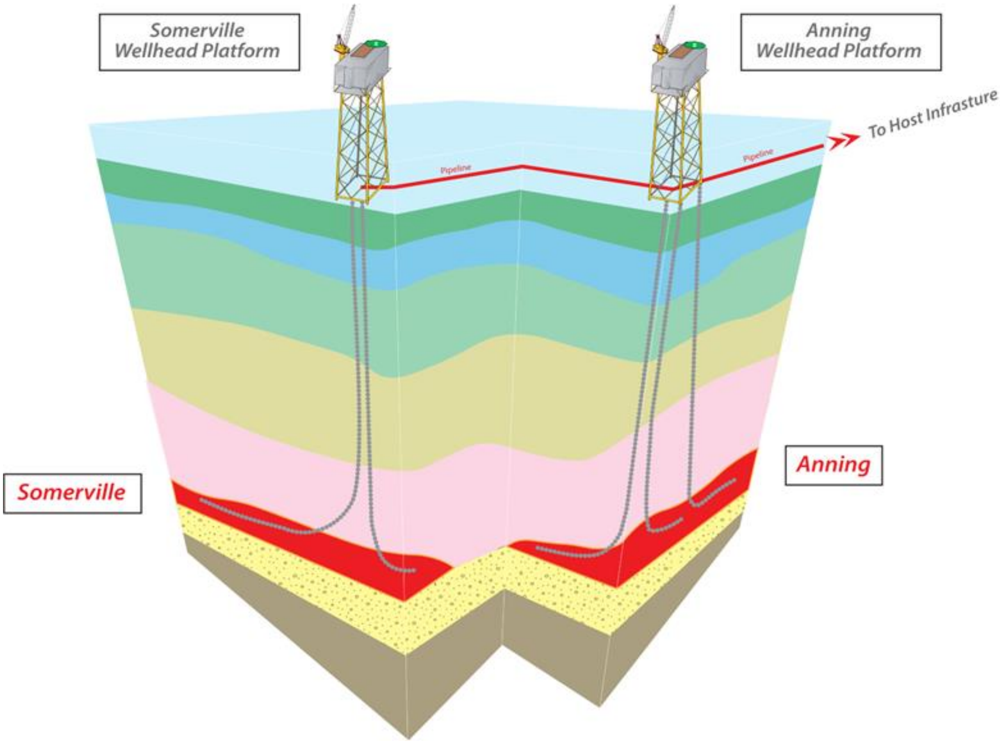
Phase I Development

The first phase will target the development of 255-380 bcf contingent resources (best case of 324 bcf) across Anning and Sommerville with two unmanned well head platforms in 60 feet (20 m) of water depth and six horizontal multi frac wells (three wells per field) to reach 140 mmcf/d. The gas export will be through third party infrastructure and the gas will be delivered at the Bacton terminal that has 500 mmcf/d spare capacity.

Total capex to first gas for Phase I is estimated at ~£200 mm with an overall capex of £350 mm. There will be a total of 30 fracs (average of 5 fracs per well) with individual horizontal well costs of £27-35 mm. A horizonal well will be 13,500-18,100 feet deep (total length, not total vertical depth). The individual IP rate of a fracced well at Sommerville is forecasted at ~60 mmcf/d and 30 mmcf/d at Anning.

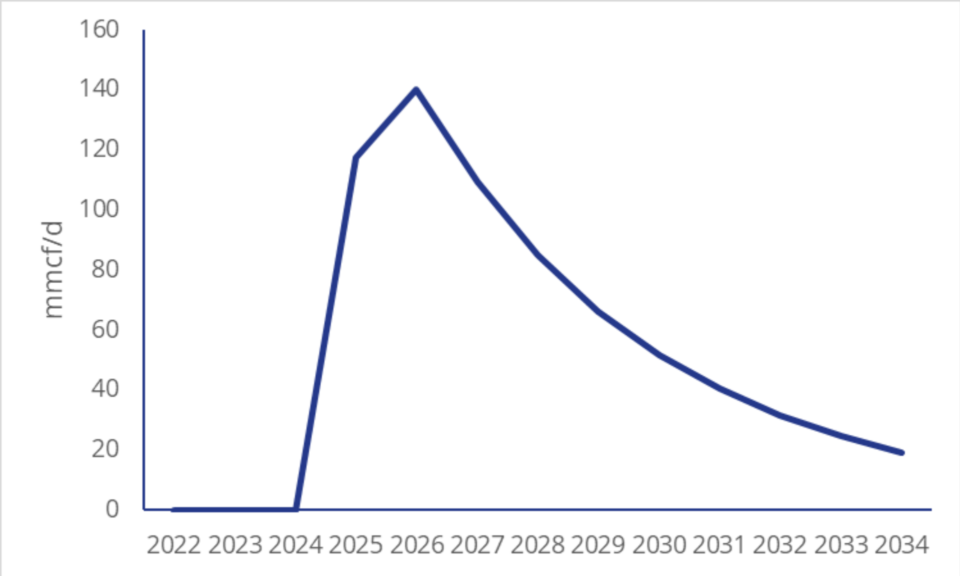
Hartshead plans to take FID on phase I in 1H23.

Figure 6. Phase I development



Source: Company

Figure 7. Phase I production profile

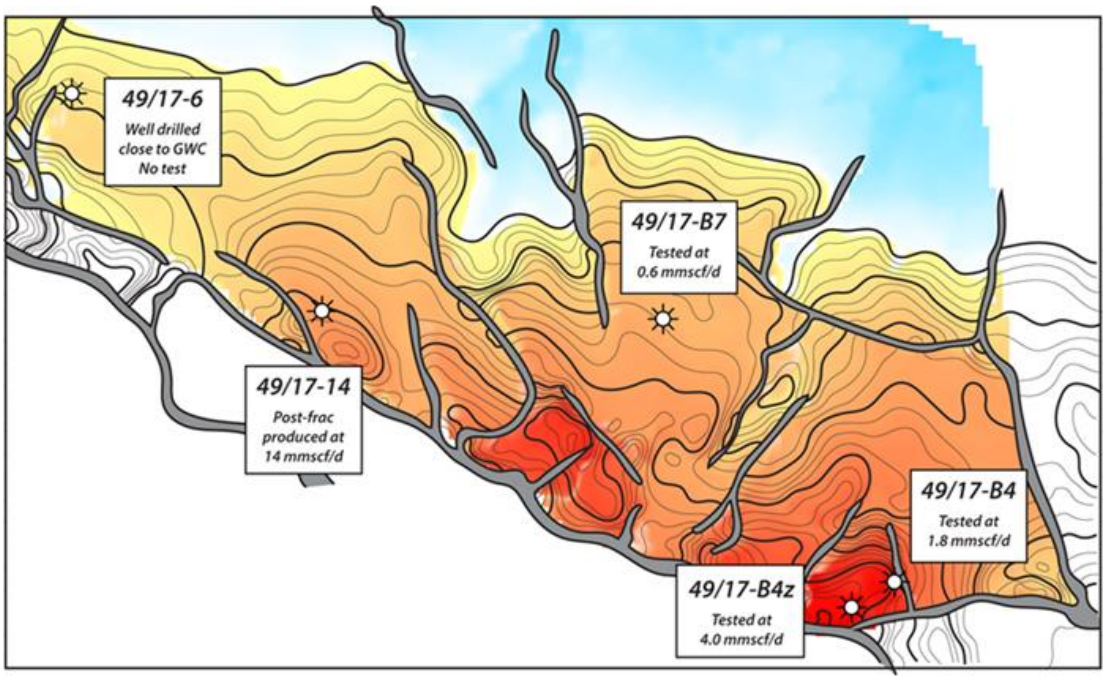


Source: Auctus and Company

The Anning field was discovered in 1969 and produced from 2008 to 2015 via a single development well which produced 13 bcf following an initial rate of 12 mmcf/d from a single frac.

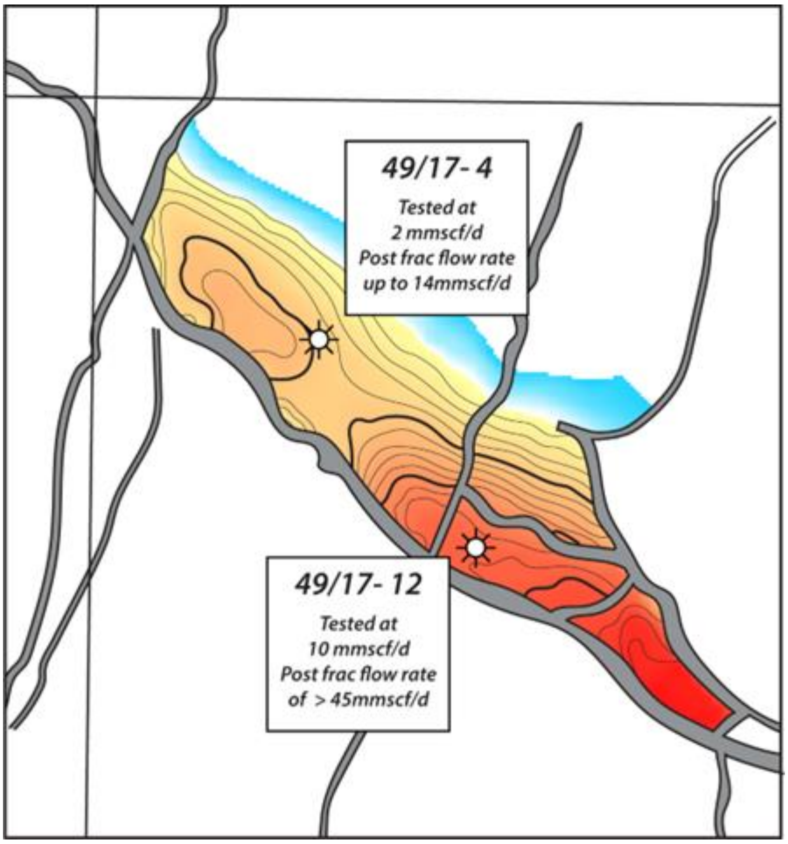
Sommerville was also discovered in 1969 and produced a total of 46 bcf from a single well from 1999 to 2014 at a maximum rate of 44 mmcf/d from two fracs.

Figure 8. Anning Gas Field



Source: Company

Figure 9. Somerville Gas Field



Source: Company

Phase II Development

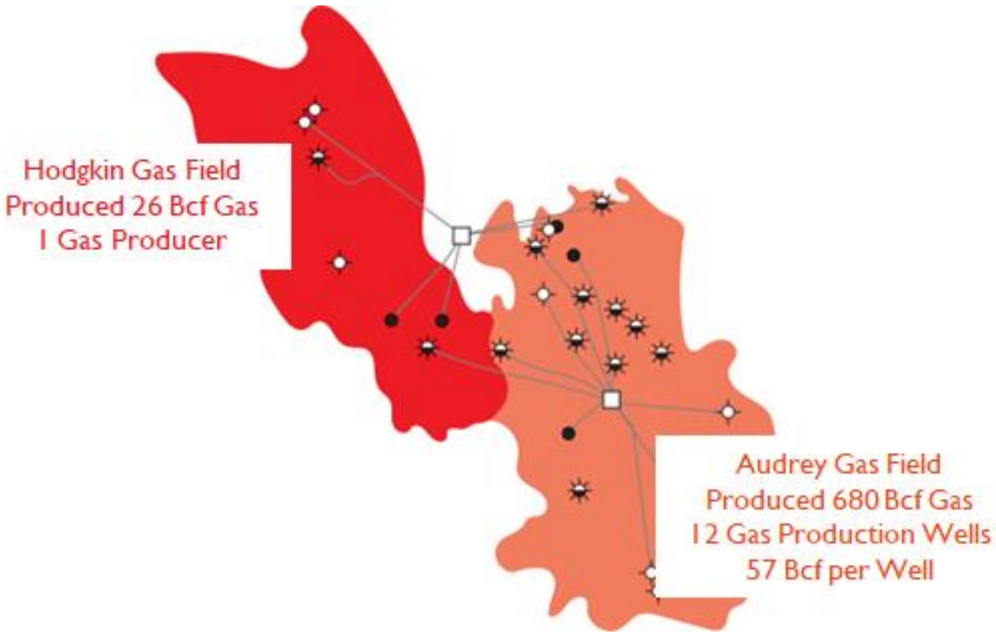
The Hodgkin and Lovelace gas fields will be developed during the second phase with 49-466 bcf contingent resources (139 bcf best case). The Phase II fields have technical uncertainty due to proximity to salt structures in the sedimentary section above the fields. Improved seismic imaging is required to reduce subsurface uncertainty and proceed with development planning.

Hodgkin is expected to be developed with a two-well dedicated well head platform with a pipeline to Somerville for a total capex of ~£100 mm.

Lovelace is a single well 5 km tie back to Hodgkin with total gross capex of ~£40 mm.

Initial production at Hodgkin and Lovelace are respectively expected to be ~50 mmcf/d and ~60 mmcf/d. At this stage we have assumed that production would start at Hodgkin in 2027 followed by Lovelace one year later.

Figure 10. Hodgkin and Audrey Gas Fields



Source: Company

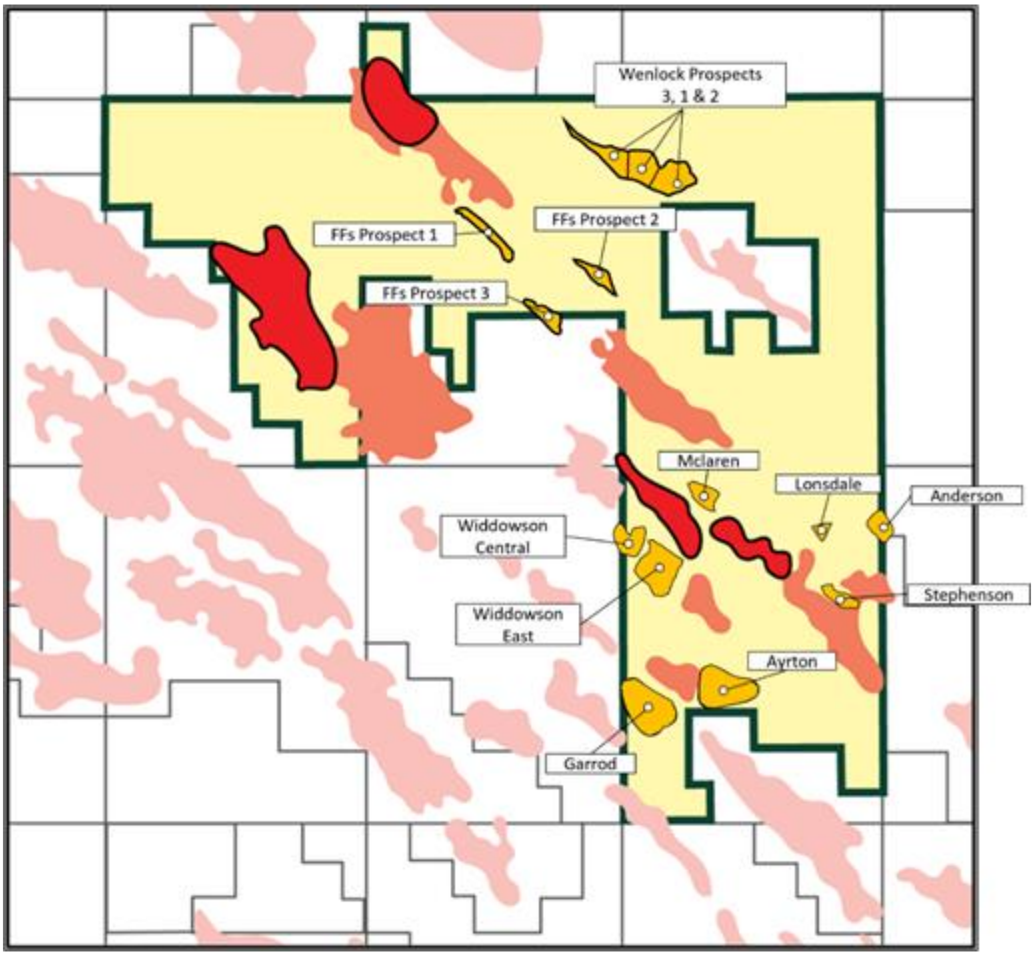
Hodgkin was part of the Audrey field that was discovered in 1975 and has produced 680 bcf from just 12 wells. The NW flank of the field (Hodgkin) represents an undeveloped part of the field with a single well penetration that produced 26 bcf of gas. Reservoir engineering studies indicate that this well alone could recover up to 153 bcf of gas whilst further mapping across the entire structure points to a potential for more than 500 bcf of gas.

Discovered in 1991 the Tethys field was placed on production via a single well which produced 18 bcf of gas. However, the Tethys North (Lovelace) part of the field remains undeveloped. The field has an estimated 39 bcf of contingent resources that could be produced by a single well.

Phase III Development

Phase III is about exploration with 143-720 bcf prospective resources across 14 prospects The McLaren prospect could be drilled as part of the Somerville development in 2024 or 2025.

Figure 11. Phase III



Source: Company

Reflections on analog developments

The main technical risk is associated with the tight nature of the Rotliegendes reservoir.

However, the success of Clipper South located nearby in the Sole Pit Basin, 15 km west of the Valiant North LOGGS platform, represents a blueprint of what is envisaged by Hartshead.

Clipper South was initially discovered in 1983. However, it was only developed in 2011 with four long horizontal wells with multiple hydraulic fractures. The field started production in 2012, with an estimated life of 15, years with ~150 bcf of reserves and ~500 bcf of GIIP. ~185 bcf have been recovered to date. The field still produces ~40 mmcf/d after 10 years of production. The average amount of gas recovered per well is ~45 bcf so far.

The individual length of Clipper South wells was ~14,000-16,200 feet with ~5 fracs per well, which is very similar to the wells planned by Hartshead (13,500-18,000 feet).

The expected 30-60 mmcf/d IP rates at Somerville and Anning compares with IP rate of 40-50 mmcf/d at the recently drilled Elgood and Blythe fields (IOG). The Elgood and Blythe wells were not fracced as the reservoirs are not as tight as at Somerville and Anning. The first wells that IOG will have to frac are at Southwark.

Figure 12. Analog fields

Fields	Historical production + remaining 2P/2C Resources (bcf)	Number of development wells	Water depth (feet)	Lentg of wells (000 ft)	Frac ? (Y/N)	Nb of frac	(expected) Peak Production (mmcf/d)
Clipper South	250	4	85	14.2-16.2	Y	23?	80
Phase I: Blythe/Elgood/Southwark	128	5	80	10.7-15.5	Only at Southwark (3 wells)	?	120
Phase I: Anning/Somerville	324	6	60	13.5-18.1	Y	30	140

Source: Companies

Valuation and financials

Valuation on comparable

Hartshead shares offer deep value compared to comparable companies. Even applying just IOG's EV/2P+2C multiples (the lowest among the UK gas E&Ps), we obtain a value of ~A$0.20-0.30 per share for Hartshead.

Using the EV/2C multiple of Chariot (which is about to start development activities and is thus at a similar stage to Hartshead) would suggest a value of ~A$0.14-0.21 per share for Hartshead.

Figure 13. Gas producers/developers valuation

	Market Cap (US$ mm)	YE21 Net debt (US$ mm)	EV (US$ mm)	2P reserves (bcf)	2P reserves + 2C resources (bcf)	EV/ 2P bcf (US$/bcf)	EV/ 2P+2C bcf (US$/bcf)
IOG	163	74	236	141	251	1.7	0.9
Chariot	234	-4	230		361		0.6
Kistos	429	68	497	109	109	4.6	4.6
Serica Energy	962	-167	795	373	373	2.1	2.1
Average						**2.8**	**2.1**

Source: Auctus

Figure 14. Hartshead valuation based on Chariot or IOG

	Harstead 2C respources (bcf)	EV/bcf (IOG) - US$/bcf	EV/bcf (Chariot) - US$/bcf	Implied Value of Hartshead (IOG) A$/sh	Implied Value of Hartshead (Chariot) A$/sh
Phase I	324	0.9	0.6	0.21	0.14
Phase I+II	463	0.9	0.6	0.30	0.21

Source: Auctus

Neither IOG nor Chariot are perfect peers, because one is funded and has started production (IOG) while the gas assets of Chariot are located in Morocco carries a higher political and regulatory risk than the UK and does not benefit from the UK's existing infrastructure. In addition, IOG owns the transport pipeline to shore (which gives a significant capex advantage) and Chariot is exposed to different fiscal terms.

It is therefore useful to look back at IOG pre-funding. The company attracted CalEnergy as a partner on its licenses in order to take the project forward which it supplemented with a £88 mm high yield bond issue to fund the development. While IOG owned the pipeline, therefore boosting the economics of the project, this is more than offset by the much lower natural gas prices at the time (~30p/therm) compared to the current environment.

CalEnergy paid £40 mm in cash plus a carry of £60 mm (net to IOG) for Phase I and is committed to a further £65 mm carry (net to IOG) for Phase II. This implies that CalEnergy paid US$140-230 mm for 50% of IOG's assets. At the time IOG was estimated to hold 158 bcf of 2P+2C resources for the Phase I development and 410 bcf for Phase I+II. The size of the overall Phase I+II developments is not very different from the size of the Phase I+II developments for Hartshead.

Assuming that Hartstead gets the **same deal** as IOG (US$140-230 mm for 50% of its assets) would value Hartstead at ~A$0.20-0.30 per share. Assuming Hartshead gets the **same deal per bcf** as IOG would value Hartshead at ~A$0.35-0.40 per share. Both of these valuations are >10x the current share price.

Figure 15. IOG/CalEnergy transaction

Fields	Gross 2P/2C at time of FID (bcf)	(expected) Peak Production at FID (mmcf/d)	Cash proceeds (US$mm)	Carry (US$ mm)	Total Transaction Value (US$ mm)
Phase I: Blythe/Elgood/Southwark	158	120	56	84	**140**
Phase I+II: Blythe/Elgood/Southwark/Nailworth/Goddard	410	220	56	175	**231**

Source: Auctus

Figure 16. Hartshead valuation based on IOG/CalEnergy transaction

	Harthsead gets the same deal as IOG		Harthsead gets the same deal per bcf as IOG			
	Price paid by buyer for 50% of the asset (US$ mm)	Implied value per share for Hartshead equity - 100% WI (A$/sh)	Net volume acquired (bcf)	Price paid by buyer US$/boe	Harstead resources (bcf)	Implied value for Harthead equity (A$/sh)
IOG Phase I	140	**0.19**	79	1.77	324	**0.40**
IOG Phase I+II	231	**0.32**	205	1.13	463	**0.36**

Source: Auctus

Net asset value

Our ReNAV for Hartshead stands at A$0.21 per share. This is based on the company's financials and our estimate of the risked value of the developments (Phase I+II). We have not given any value to Phase III yet given it consists of exploration activities that will depend on the success of the development.

We have made the conservative assumption that Hartshead would sell 50% of its assets for US$100 mm in the form of cash or a net carry. This is well below what IOG achieved and could be too conservative. We have then assumed that Hartshead would raise ~US$100 mm in a combination of debt and pre-payment finance. We have further risked the net value of the Phase I development with a 70% chance of development to capture some potential future funding costs, particularly ahead of securing a farm-in partner. We have risked Phase II with a 50% chance of development pending further visibility. The development of Phase II would be funded by cash flow from Phase I.

We have used our estimates of net cash at YE22 (~A$1.9 mm/US$1.4 mm) and current yearly G&A that we have treated as a perpetuity. We used 10% discount rate for the UK. We are using a NBP UK gas price of ~85p per therm from YE24.

Figure 17. NAV10 Table (as of YE22)

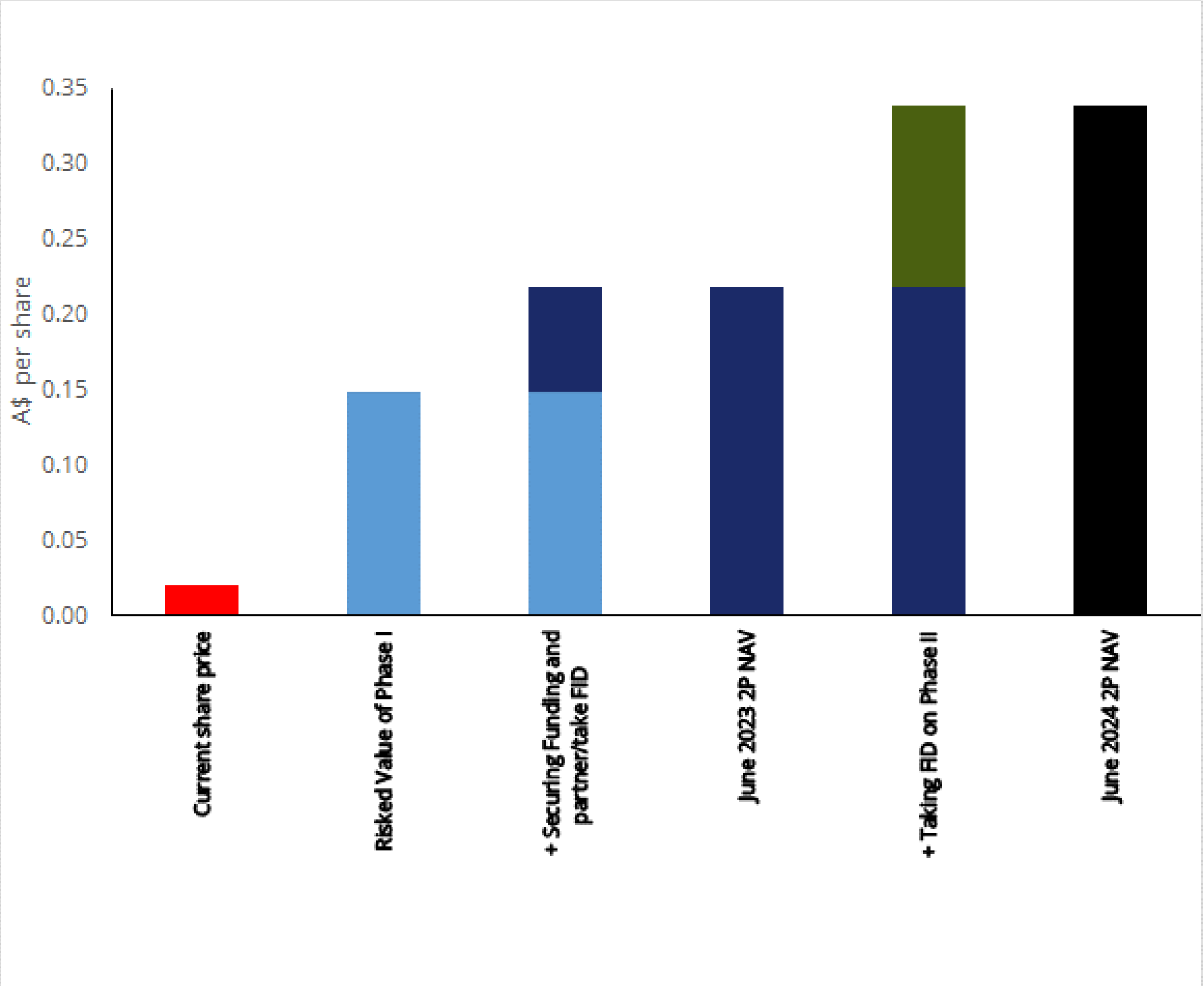
	WI Reserves / Resources (mmboe)	Unrisked NAV (US$ mm)	Unrisked NAV/sh A$/Share	GCoS (%)	EMV (US$ mm)	A$/Share	% Total
Net Cash (YE22)		1	0.001		1	0.001	0%
G&A		-21	-0.015		-21	-0.015	-7%
UK							
Phase I	54	333	0.232	70%	233	0.162	78%
Total Core NAV		**313**	**0.218**		**213**	**0.148**	**71%**
UK							
Phase II	23	174	0.121	50%	87	0.061	29%
Phase III	0	0	0.000	0%	0	0.000	0%
Total Risked Apparaisal & Exploration		**174**	**0.121**		**87**	**0.061**	**29%**
Total NAV		**487.85**	**0.339**		**301**	**0.209**	**100%**
Unrisked NAV						**0.362**	
P/Core NAV					**13.5%**		
P/NAV					**9.6%**		
P/Unrisked NAV					**5.5%**		

Source: Auctus, Company Disclosures

Value build-up

Our core NAV based on the company's 2C resources of the Phase I development is ~A$0.15 per share. The key event to unlocking this value is the completion of the tariff arrangements with the host infrastructure owner, the securing of a farm-in partner and the subsequent FID in 1H23. Defining better the resources and the capex programme for Phase II will also start unlocking the value of Phase II.

Figure 18. Value build-up



Source: Auctus

Other forecasts and assumptions

We have assumed first gas from Phase I would occur around YE24. Gross capex to first gas is estimated at ~£200 mm (~US$280 mm) with an overall capex of £350 mm for Phase I. Assuming Hartshead divests 50% WI would lead to net capex to first gas of £100 mm (US$140 mm).

We assume that £7 mm fixed opex per year plus 4p per therm tariff (=30% above the government guidance for tariff).

For Phase II, we are assuming a production start-up at Hodgkin in 2027 with initial gross production of 50 mmcf/d during the first year followed by Lovelace in 2028 with an additional 60 mmcf/d gross production and a total gross capex of £140 million. We have assumed that Hartshead would also have divested 50% of Phase II (at the same time as Phase I) by then along the lines of IOG did.

Ring Fence Corporate tax in the UK is 30% with Supplementary Charge (SCT) of 10%. A 62.5% uplift on capex is allowed for SCT purposes. A new Energy Profit Levy (EPL) of 25% has been introduced in May. A 80% uplift on capex is allowed for EPL purposes. The sunset for this new tax is YE25. It has therefore no impact on Hartshead resources future cashflow.

Financials

Hartshead held A$3.7 mm in cash at the end of March 2022. Once the company has secured a farm-in partner (for US$100 mm in cash and net carry), we assume a bond and/or a pre-payment facility of US$100 mm with an interest rate of 10% per year.

Hartshead holds non-core assets in Gabon and Madagascar. In Gabon, the company's Nkembe asset has been in force majeure since 2018 due to a dispute for US$2.91 mm associated with potential contributions to funding obligations. Harsthead has received legal advice that no fund contributions are outstanding. In Madagascar, the license obligations for the Third Exploration Phase of the Ambilobe block and are estimated at US$2.5 mm. The Third Exploration Phase expired in 2019 and the company has presented a relinquishment proposal and is awaiting a response from OMNIS.

Capital structure

As at the end of May 2022, there were 1,854.772 mm common shares in issue. In addition, there are 108.8 mm performance rights that would be converted in shares on hitting milestones and 20 mm options with an exercise price of A$0.01 per share.

Risk analysis

In our view, there are five specific areas of risks to the story:

1. Geological risks. Low IP rates or lower recovery per well would have an impact on economics. We however note that the resources of Phase I are very well defined suggesting limited variance of the expected recoverable volumes. All the fields have produced in the past.

2. Execution. The field development plan is based on a small number of long horizontal wells that are capex intensive. A well poorly drilled could have to be redrilled. In addition the wells require hydraulic stimulation that could be unsuccessful. We however note that very high performance hydraulically stimulated wells have been drilled on the fields. In addition, the resources are very large and the economics very good. The value of the assets is well above the current market cap of the company. For this to change in a meaningful way, the development costs would have to be materially higher or the start-up date materially delayed.

3. Gas price. The economics of the project are highly sensitive to UK gas prices. A collapse in natural gas prices would have a material impact on the value of the developments. We are using 85p/therm for our forecasts, which is less than half of the current prices for natural gas in the UK.

4. Host infrastructure and tariff. The fields are developed through infrastructure not owned by Hartshead. Finalizing agreements on tariffs is a key step to taking the project to production.

5. License obligations in Gabon and Africa. There are US$5.5 million of potential liabilities associated with work commitments in these two countries. These assets are non-core and the license in Madagascar expired 3 years ago. The contingent liability in Gabon relates to a dispute from 2014 and the block is in Force Majeure.

Appendix 1: Board of Directors and Management

Bevan Tarratt: Non-Executive Chairman

Bevan has a background in the corporate and financial services industries having worked in various accounting and corporate broking firms for the past 15 years. Bevan has experience in the recapitalisation, restructuring and acquisition of assets for numerous ASX companies and was a Client Advisor at Patersons Securities and Partner of a venture capital firm. He is well experienced in executive and non executive board roles with over 20 years of experience.

Christopher Lewis: Chief Executive Officer

Chris is a geophysicist with over 29 years' experience in the oil and gas industry having worked for major E&P companies, junior and small cap companies and service companies and was the Chief Executive Officer of Hartshead Resources Limited. He was previously CEO of Zeta Petroleum (sold to GMI Limited) from 2005 to 2009. He was VP of exploration at Centric Energy in 2010. Centric was awarded licences in the Kenya Tertiary Rift Basin, that was later farmed out to Tullow Oil. Centric Energy was sold to Africa Oil. Chris was also VP Exploration at Lion Petroleum in 2011. Lion had two blocks onshore Kenya and was reversed into TSX listed Taipan Resources. From 2013 to 2014, He was a co-founder of Black Star Petroleum that was awarded exploration licenses offshore Guinea Bissau and Namibia and sold company to Impact Oil and Gas.

Dr Andrew Matharu: Chief Financial Officer

Andrew has over 27 years' experience in the oil and gas sector having commenced his career as a Petroleum Engineer with Chevron and Kerr McGee in the UK North Sea. Following a move into investment banking he focussed on oil & gas equity research, corporate finance and equity capital markets roles at JP Morgan-Cazenove, Bridgewell Securities, Numis and Westhouse Securities where he advised a number of AIM listed oil & gas companies. Andrew has a wide experience of financing private and publicly-listed small and mid-cap companies in the oil and gas sector and also served as Vice President of Corporate Development at AIM-listed Tower Resources plc where he was involved in a series of corporate and asset transactions and capital raisings. Andrew holds a BEng(Hons) degree in Chemical Engineering from the University of Sheffield, a PhD in Chemical Engineering from the University of Cambridge and is a Chartered Engineer.

Nathan Lude: Executive Director

Nathan has broad experience working in Asset Management, Mining and the Energy Industry. Nathan is well experienced in project identification and project development for multiple ASX companies. Previous roles include Business Development Management role for a large Canadian energy company and Executive Director roles for a number of ASX listed companies.

Appendix 2: Main shareholders

Figure 19. Top shareholders

Shareholders	%	Position (mm)
MR CHRISTOPHER LEWIS + FAMILY	12.50	231
DR ANDREW MATHARU	6.60	122
JALBAR PTY LTD	4.70	87
GULF NATURAL RESOURCES PTY LTD	4.60	86
ALITIME NOMINEES PTY LTD	4.50	84
MR DONALD FERGUSON	4.40	81
MR JONATHAN JAMES TREEN	4.30	79
CITYSCAPE ASSET PTY LTD <CITYSCAPE FAMILY A/C>	2.20	40
MR MARK BRACEWELL	2.10	40
MR STEPHEN SMITH	2.10	40
J & TW DEKKER PTY LTD <J & TW DEKKER FAMILY A/C>	1.80	33
CITICORP NOMINEES PTY LIMITED	1.30	24

Source: Company

The Directors of the company hold a total of ~20% of the share capital while management holds 11.7%.

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