

23 March 2018

OIL & GAS



Change of Analyst

Marketing Communication (Connected Research)

Independent Oil & Gas[#]

BBG Ticker: IOG LN

Price: 15p

Mkt Cap: £17.7m

BUY

Southern North Sea Gas Development

Gas Hub Strategy Drives Strong Returns

Independent Oil and Gas (IOG LN) intends to develop a number of gas fields in the Southern North Sea with strengthened economics due to an innovative hub spoke strategy. This is made possible by the acquisition of the Thames Pipeline which saves IOG up to a hundred million pounds in development capital. It enables IOG to tie in each of the fields to the pipeline, which will be 100% owned, providing a secure export route for the gas.

Our analysis of the development produces an unrisks NPV of £374m using gas prices of 45p/therm and US\$60/bbl oil along with a 10% discount rate. We anticipate combined peak flow to be 183mmcf/d with production commencing in Q4 2019.

Significant Exploration Upside at Harvey

In addition to the CPR on the primary development hubs, IOG has also recently released a CPR on its appraisal asset, Harvey. The CPR demonstrated best estimates of 90BCF in on-license prospective resources with 114BCF for the whole structure. The high and low estimates were 226BCF and 36BCF for the on license resources. Therefore, Harvey could end up being IOG's largest asset. Following the publication of the CPR, IOG has committed to drilling an appraisal well before year end 2019.

Visible Path to Development

IOG currently anticipates commencing production in H2 2019, although individual field development is staggered so as to best manage cash flows. The company is yet to confirm project financing, however, by discussing advantageous commercial terms with service providers **Schlumberger**, **Heerema** and **ODE**, which include LOIs on capital deferrals, IOG has significantly reduced the upfront funding requirement. This alongside a possible prepay offtake agreement and conventional debt is likely to result in a far more manageable equity component for a junior development company thereby providing a visible path to development, in our view.

Recommendation and Target Price

We issue a **BUY** recommendation and target price of **72p**.

Company Description

Independent Oil & Gas is a junior oil & gas development company focussed on the North Sea.

One Year Price Performance



Price % chg	1mn	3mn	12mn
	-11.3%	-22.4%	-10.6%

12mn high/low: 26p/12.5p

SOURCE: FactSet, as of 22/03/18 close.

Market:	LSE AIM
Price target:	72p
Shares in issue (fully diluted):	120.2m (323m)
Free float:	93%

Major shareholders

Hargreaves Lansdown AM	14.29%
Young PJ	11.51%
Interactive Invest Trade Ltd	9.17%

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#VSA Capital acts as Joint Financial Advisor to Independent Oil & Gas.

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Investment Case

In recent months **Independent Oil & Gas (IOG LN)** has announced significant progress towards the development of its 100% owned Southern North Sea gas assets including Competent Persons Reports across the asset base as well as the repayment of Skipper creditors and additional funding from major stakeholder, **London Oil & Gas**, which mean the company is funded to FID. CPRs on the advanced Blythe, Elgood and Vulcan satellites demonstrate a significant increase in contained gas at the 2P reserve level to 303BCF along with robust economics. In addition, a CPR on the Harvey satellite highlights the potential of this attractive resource, which we believe may prove to be the strongest asset within IOG's portfolio.

The development plan for each of IOG's assets is underpinned by the acquisition of the decommissioned Thames pipeline. On completion of the acquisition IOG will own 100% of the asset into which IOG intends to tie back each of its development fields. This is likely to save the company around £100m in development capex and is vital to the attractive economics of the project. Indeed, our analysis produces an NPV on the advanced development fields of £374m. With a pipeline capacity of 330mmcf/d and predicted peak flow of c180mmcf/d from IOG's assets there is potential for further production to utilise the pipeline, which may include IOG's own developments such as the Harvey field or indeed even tolling third party gas through the pipeline. Our view therefore is that the NPV on the core development represents a base case scenario with additional developments providing attractive further upside potential.

The potential of IOG's development programme has been recognised by a number of major service providers such as **Schlumberger, Heerema** and **ODE**; each of which have signed LOIs to make significant capital deferrals. This has two significant implications, firstly, it provides credibility to IOG's development plans which should provide investors with confidence and secondly it reduces the upfront funding requirement. We anticipate that this phasing of the project should reduce the funding requirement of £466m by approximately 50%. The contractor funding should provide a sizeable proportion of the remaining requirement with the majority of the balance being debt and a likely modest equity requirement, in our view. This therefore becomes far more manageable for a company such as IOG thereby enabling it to remain independent and a 100% owner of its portfolio.

Thames Pipeline

The Thames pipeline which is currently owned by **Perenco, Tullow (TLW LN)** and **Centrica (CNA LN)** is the key to IOG's development programme. Having acquired its South North Sea (SNS) assets at low cost (as they were considered to be stranded) the signing of the sale and purchase agreement in April 2017 for the Thames pipeline transformed the investment case for IOG and the development rationale for its portfolio. The terms of the agreement require posting of £2.5m in security to Perenco of which £0.5m relates to pipeline integrity surveys and £2.5m for future decommissioning, which is not payable until first gas. The pipeline was acquired for a nominal sum, although it enables IOG to save c£100m in development capex and avoid paying transportation tariffs. The transaction is expected to complete during March 2018.

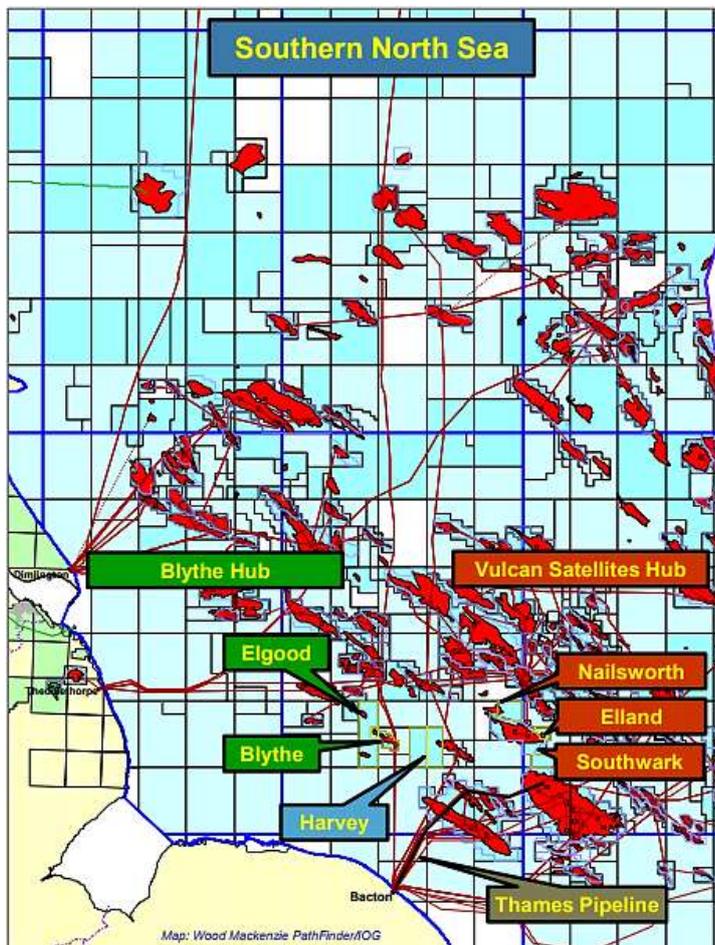
The aim is to tie back each of the fields to the pipeline feeding directly to the Bacton gas processing terminal in North Norfolk which has operated with spare capacity for a number of years. IOG are confident that this will continue to be the case. Since the pipeline was only decommissioned in 2015 with an estimated further life of 25-40 years, remedial work is expected to be limited. Once any remedial work is complete IOG will be able to dewater and recommission the pipeline, which will be the first time a SNS pipeline has been bought back into operational life. The pipeline was decommissioned due to the Thames cluster fields being fully depleted.

With IOG's current portfolio only currently expected to produce for around 15 years and with peak flow rates at around 180mmcf/d the pipeline is expected to support IOG over the entire asset life. The expected further useful life of the pipeline is based on expected corrosion rates at full capacity and there is therefore scope for IOG to utilise the minimum remaining 120mmcf/d capacity for third party gas on which it would receive a tariff, which could potentially enhance the project economics.

IOG are using an intelligent pigging process to assess the condition of the pipeline. This is due to be carried out in H1 2018 and will measure the thickness and status of the pipeline. We do not expect the recommissioning and completion costs of the acquisition to be more than around £4m, of which £2.5m is required as a payment to the current operator for future decommissioning.

The acquisition is clearly a significant advantage for IOG and has allowed a significant capital saving as well as providing a secured export route for its gas. With this security IOG has been able to fast track its development programme and provide contractors with greater confidence in the project's viability, which directly feeds into IOG's ability to secure attractive terms on capital deferrals.

Map: Southern North Sea, IOG Assets



SOURCE: Company Data, VSA Capital Research.

Southern North Sea Gas Hub Strategy

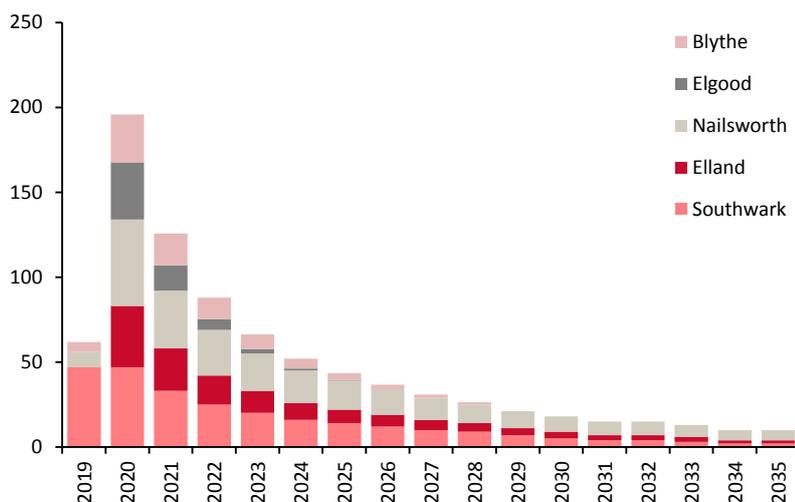
IOG's SNS gas hub strategy brings together a number of attractive gas fields along with some smaller fields. The hub strategy leverages the attractive economic potential of the larger fields under IOG's ownership by spreading the share of infrastructure costs and opening up smaller fields which would otherwise be considered uncommercial and stranded. What is particularly impressive in IOG's case is that a significant portion of the infrastructure exists with the 100km Thames Pipeline providing a secure 100% owned export route for gas from the Blythe, Elgood, Vulcan Satellites and subsequently Harvey gas fields.

IOG acquired the assets during 2016, spending £5.5m on Blythe in total (of which £4m is deferred until first gas) and a total consideration of £5m (paid in milestones) for the Vulcan satellites. The implied valuation on Blythe of US\$2.35/boe looked a good deal at the time for IOG, however, having upgraded the 2P reserves to 33mmboe from 6.1mmboe (34.3BCF) by 92%, the acquisition price appears even more attractive, in our view. Similarly, at the Vulcan

Satellites, a significantly larger hub, which at the time of acquisition had estimated 2C Resources of 131.1BCF has now evaluated at 245.1BCF 2P Reserves IOG also demonstrated significant value add with an initial acquisition value of less than US\$0.22/boe.

The attractive acquisition price for each field was possible as without an export route, the assets were considered stranded and therefore uncommercial. The Thames Pipeline and hub strategy has therefore changed the game, spreading the costs of infrastructure across the assets and creating economies of scale. Our analysis which, unlike the CPR, incorporates commodity prices closer to spot and the five year average as well as IOG’s tax losses, produces an NPV of £374m with development capex of £466m of which a significant portion is to be deferred. Our analysis assumes 44p/therm gas prices and a 10% discount rate.

Production Profile SNS Hub, mmcf/d



SOURCE: Company Data, VSA Capital Research.

IOG envisage a three phase development programme, staggering first gas at the fields to better manage cash flows, with Blythe and Elgood due online in 2019, along with Southwark, while Nailsworth and Elland from the Vulcan Satellites will be commissioned in 2020. Harvey, where an appraisal well is required, is currently expected to produce first gas in 2021. We anticipate total production of 74mmboe over a 16 year field life for the total portfolio.

SNS Hub Highlights

	Blythe Hub	Vulcan Satellites Hub	Total
First Gas	Q4 2019, Q1 2020	Q4 2019, Q2 2020, Q3 2020	
Peak Gas	2020	2020	
Peak Flow, mmcsfd	49	134	183
Economic Life, Hub	6 years	15 years	
NPV, £m (10%)	49	325	374
Development Capital, £m	131	339	470

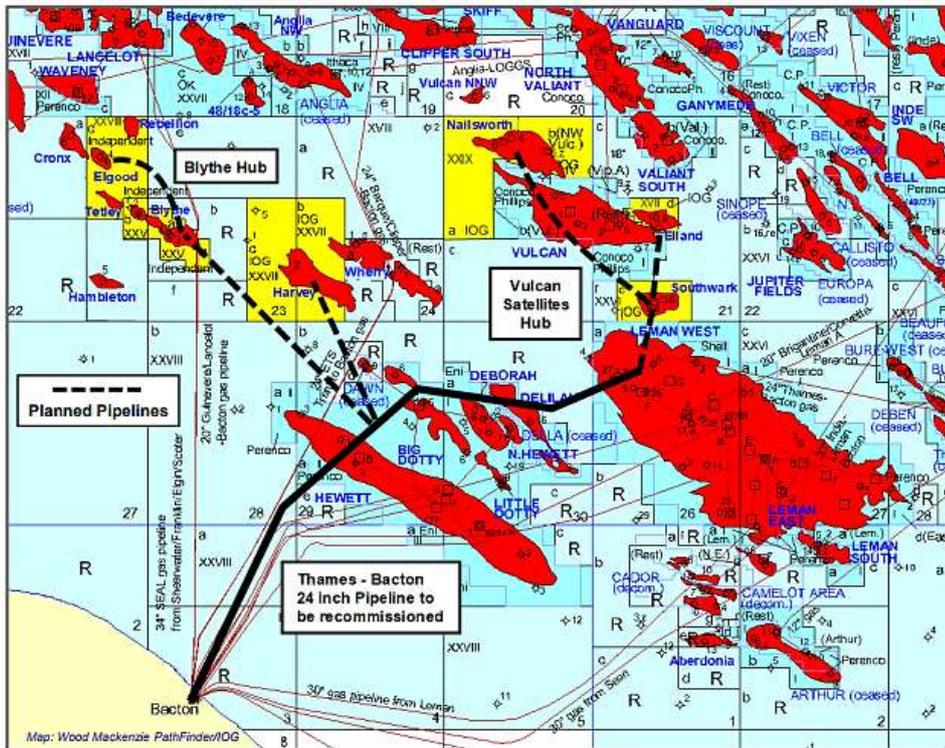
SOURCE: Company data, VSA Capital Research.

In the case of Blythe, Elgood and the Vulcan satellites each of the fields are of tight gas with porosities generally close to 0.1mmd although at Elgood they are a little higher. In the case of the Vulcans, IOG intends to utilise hydraulic stimulation. IOG intends to use Normally Unmanned Installations (NUI) to further limit development capital. At Blythe one NUI with a single horizontal well is planned while a single well will also exploit the Elgood field and this will be tied back to the Blythe platform.

At Vulcan satellites where the permeability is lower, IOG will hydraulically stimulate the reservoirs to boost flow rates and each of Nailsworth, Elland and Southwark will have an NUI but with two to four well slots with three gas production wellheads on Nailsworth and Southwark and two production wells on Elland. However, with higher porosity

at Harvey it is anticipated that this can be produced conventionally. As a result, the project ties in closely with the UK Government’s North Sea strategies to maximise exploitation of tight gas (“Southern North Sea Tight Gas Strategy”) and maximising value from the region (“The Maximising Economic Recovery Strategy for the UK”).

The Thames Pipeline and IOG’s SNS Portfolio



Areas highlighted in yellow denote IOG licences

SOURCE: Company Data, VSA Capital Research.

Blythe Hub

Blythe was first drilled in 1987 with gas found in the Rotliegendes Lemans formation. Gas was tested to surface from three separate intervals in the Carboniferous. The maximum rate achieved was 0.9mmcf/d from an unstimulated vertical test and was consequently deemed uncommercial as it was before the advent of horizontal multi fracture stimulated wells. Oil has flowed to surface from the naturally fractured Zechstein carbonates from two wells above the Blythe Lemans gas discovery. Given the discovery wells previously drilled, it was not necessary for IOG to carry out further drilling. However, the company have carried out significant work in terms of reprocessing seismic data to gain a better understanding of the underlying formation. This work resulted in confirmation of 2P reserves at 33bscf of which 23bscf are at the 1P reserve level of confidence.

Blythe Hub Reserves and Resources

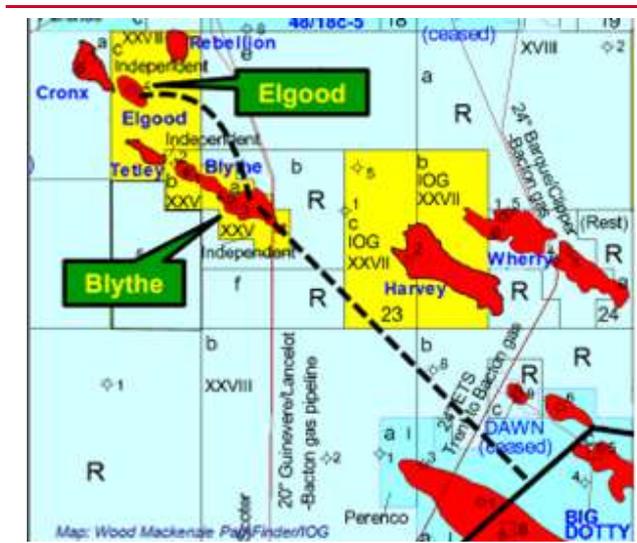
Field	Gas EUR (bscf)			Condensate EUR (mmbbl)		
	1P	2P	3P	1P	2P	3P
Blythe	25.2	33.0	44.1	0.3	0.3	0.4
Elgood	14.7	21.7	32.6	0.1	0.2	0.3
Total	39.9	54.7	76.7	0.4	0.5	0.7

SOURCE: Company Data, VSA Capital Research.

The recently produced CPR anticipates peak gas flows of 24mmcf/d and a producing life of nine years. Our estimates are in line with company guidance in terms of production estimates. First gas is now assumed to be Q4 2019. Development capital relating to the Blythe hub alone is expected to be around £89m, which includes the NUI and will

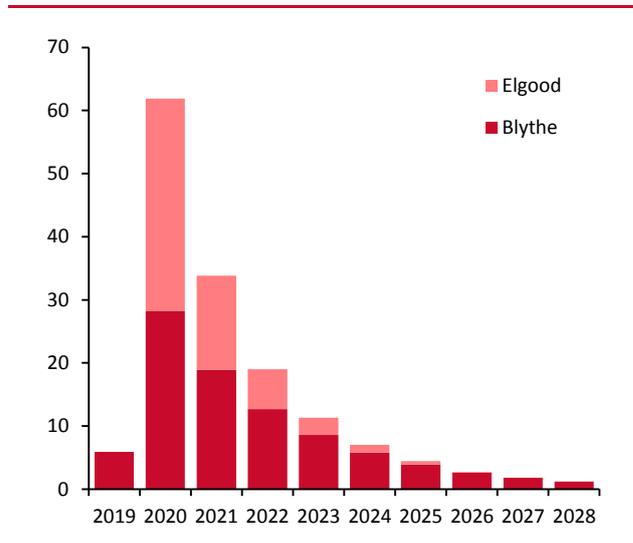
also link to the Elgood field. It will then be tied back into the Thames Pipeline via a 10" pipeline. IOG previously signed an offtake agreement with **BP Gas Marketing (part of BP LN)** for the gas from the Blythe field.

Map: Blythe Hub



SOURCE: Company Data, VSA Capital Research.

Blythe Production Profile, mmcfd



Elgood

Elgood forms the second part of the Blythe hub. It was discovered by **Enterprise Oil** in 1991 and gas is also hosted in the Rotliegend Leman sandstones like Blythe. Elgood is a smaller discovery than Blythe, with a current resource of 27Bcf from which IOG have upgraded from 17Bcf via reprocessing of the seismic data and reservoir modelling. As a smaller field, the tie back to Blythe and the broader hub strategy is crucial to the making the economics of this discovery viable.

Vulcan Satellites Hub

The second IOG hub is the Vulcan Satellites; Elland, Nailsworth and Southwark. Unlike Blythe and Elgood the project is tight gas and the wells will all be hydraulically stimulated with each field having an NUI. The fields will tie back into the platform at Southwark which will then be tied back via a 24" pipeline to the Thames Pipeline. The NUI plans are similar to those at Blythe. The development timetable is different, however, within the Vulcan Satellites Hub. First gas at Southwark is now targeted for Q4 2019, Q2 2020 for Nailsworth and Q3 2020 for Elland.

Vulcan Hub Reserves and Resources

Field	Gas EUR (bscf)			Condensate EUR (mmbbl)		
	1P	2P	3P	1P	2P	3P
Nailsworth	60.4	99.4	147.2	0.60	1.00	1.50
Elland	39.9	55.0	72.9	0.00	0.00	0.10
Southwark	61.2	94.2	137.7	0.00	0.10	0.10
Total	161.5	248.6	357.8	0.60	1.10	1.70

SOURCE: Company Data, VSA Capital Research.

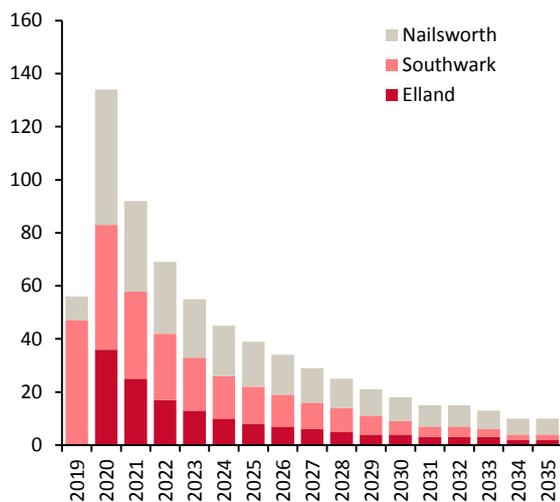
The Vulcan Satellites lie around 35-40km to the East of the Blythe hub and were acquired, ready for development, with no further appraisal required. The satellites were first discovered via a well drilled by **Shell** and **Exxon** in 1987. Subsequent discoveries were made in 2000 by **ConocoPhillips** and in 2006 by **Verus Petroleum**. As at the Blythe hub the gas is found in the Rotliegend Leman sandstone. Porosities are lower at Vulcan than at Blythe and IOG expect to hydraulically stimulate the targets with multiple fracked horizontal wells.

The CPR indicates potential peak flow of 134mmcf/d with production over a 16 year life with eight wells across three fields. Our NPV valuation for the Vulcan hub is £325m with hub capex of £249m. A field development plan was submitted in October 2017 following reservoir modelling and reprocessing of 3D seismic data which resulted in confirmation of 2P reserves of 248BCF. This was a significant upgrade in terms of confidence with 2P reserves on the asset having previously been categorised only as 2C resources.

A final investment decision is likely to be made in early 2018. Vulcan is currently the key asset within IOG’s hub strategy although again it is the secure export route and enhanced returns owing to the existing Thames Pipeline which are key to the economics and potential returns.

Vulcan Satellites production Profile, mmcfpd

Map: Vulcan Satellites



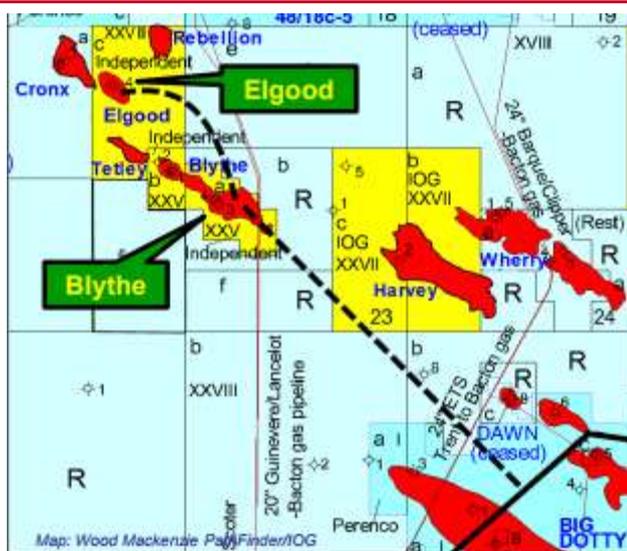
SOURCE: Company Data, VSA Capital Research.

Harvey

The Harvey field has the potential to be the largest of IOG’s development prospects. The recent CPR confirmed most likely prospective resources of 114 BCF, although with a maximum of 286 BCF, which was in line with management guidance. However, unlike IOG’s other 100% owned assets it is at an earlier stage of development and although IOG has avoided taking on similarly earlier stage development risk elsewhere in its portfolio, the CPR confirms the significant upside potential. A well drilled in 1984 confirmed the presence of gas in the system although this was in the down dip portion of the structure and on the Western flank. Reassessment of the data by IOG has indicated that drilling an appraisal well up dip could result in the confirmation of a significantly larger gas resource. Additionally, the well was not tested so mobility of the gas is not yet known, hence the categorisation as a prospective resource.

Following the publication of the CPR, IOG has committed to drilling the appraisal well by the end of 2019, a key commitment for gaining a license extension from the OGA. We note that the entire structure that has been identified does not lie within IOG’s license area. Indeed, around 21% of the 114BCF best estimate resource is off license implying an attributable resource of 90BCF based on the current license limits. We believe though that subject to a successful appraisal well ore potentially even earlier that IOG would be well placed to gain the necessary license expansion given the limited portion of the structure outside of the existing license area. Furthermore, IOG’s tight gas strategy and utilisation of the decommissioned Thames Pipeline both of which align closely to the OGA and UK Government’s plans for the Southern North Sea. We therefore expect IOG to receive their full support from both.

Map: Harvey



SOURCE: Company Data, VSA Capital Research.

Currently our valuation of 13p/sh. is based on Elgood as the closest analogue; however, we believe that the economics of Harvey could potentially be stronger than the nearby fields. There is a fault line which runs between the Harvey and Elgood fields and the differing structural nature on each side means that permeability is significantly higher on the Harvey prospect than on either of the Blythe or Vulcan hubs at 10-20%. Consequently, there is potential for Harvey to be a exploited as a lower cost conventional prospect unlike the rest of IOG’s portfolio but again most likely using the NUI approach and a tie back to the Thames Pipeline.

Harvey Prospective Resources

	Gas (bcf)			Condensate (mmbbl)		
	Low	Best	High	Low	Best	High
Harvey - within License P2085	36	90	226	0.4	0.9	2.3
Harvey - Total Structure	45	114	286	0.5	1.1	2.9

SOURCE: Company Data, VSA Capital Research.

The license was recently updated following a firm commitment to drill in the next two years. IOG have been granted a two year extension to December 2019 and now the company intends for a rig contract to be in place by 20 November 2018. IOG is likely to require additional funding in order to drill the appraisal; however, we believe the potential is clear and the prospect has the potential to significantly enhance IOG’s SNS gas hub strategy.

Development Plan

We believe that the approach taken by IOG’s management to date offers shareholders’ and creditors a strong development plan which offers attractive economic potential and can be realised whilst retaining full control and ownership of the assets base. IOG is now carrying out site surveys across the assets in the Blythe and Vulcan hubs through Q1 2018. With intelligent pigging being carried out immediately thereafter. IOG anticipate being in a position to make Final Investment Decisions at the end of the quarter. Construction at Blythe and Southwark is then intended to commence immediately afterwards.

IOG Planned Development Programme

Hub	Field	2018				2019				2020			
		Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
Blythe Hub	Blythe	Site Surveys ✓		Construct & install infrastructure	Well permits	Drilling B1	First Gas						
	Elgood	Site Surveys ✓		Construct & install subsea infrastructure	Well permits	Drilling E-SS	First Gas						
Vulcan Satellites Hub	Southwark	Site Surveys ✓		Construct & install infrastructure	Well permits	Drilling S1	First Gas Drilling S2	Drilling S3					
	Nailsworth	Site Surveys ✓		Construct & install infrastructure	Well permits	Drilling N1	First Gas Drilling N2	Drilling N3					
	Elland	Site Surveys ✓		Construct & install infrastructure	Well permits	Drilling E1	First Gas Drilling E2						
		EIA Application		Intelligent Pigging Programme ✓		FDP Approval & Final Investment Decision							

SOURCE: Company Data, VSA Capital Research.

License Information

	License no.	Interest	Operator	License Expiry Date
Blythe	P1736	100%	IOG	31/12/2018
Elgood	P2260	100%	IOG	31/01/2019
Nailsworth	P130/2342	100%	IOG	31/12/17, 31/07/2019
Southwark	P1915	100%	IOG	31/01/2020
Harvey	P2085	100%	IOG	20/12/2019

SOURCE: Company data, VSA Capital Research.

Project Capital and Deferrals

Funding in the short term and for the project financing are the major catalysts for IOG. However, recent announcements suggest that the company is making significant progress in reducing the upfront capital cost from £466m. IOG is expecting to achieve agreed capital deferrals of more than 50% to first gas, which significantly reduces the initial funding requirement and limits the impact of a potentially large equity component on existing shareholders. This is crucial, in our view, to making the goal of retaining 100% ownership across the portfolio viable. Additionally it should provide investors with confidence in the economic viability of IOG's strategy and the attractive nature of the hub strategy.

- **Schlumberger** – in September 2017 IOG announced that it has signed an LOI with Schlumberger regarding a Consultancy Master Services Agreement for the SNS gas hubs. This agreement will be key in helping IOG ahead of the Final Investment Decision and subsequent execution plans, however, no details are available in terms of costs or deferrals.
- **Heerema Fabrication Group** – in October 2017 IOG announced that it had signed an LOI with Heerema in relation to the Front End Engineering and Design (FEED) and Engineering, Procurement, Construction and Installation (EPCI) costs for up to four NUIs. This is all that is currently planned as part of the two hubs in terms of NUIs and covers a significant portion of the development capex. FEED costs are agreed to be fully deferred while EPCI costs are to be 50% deferred to first gas.
- **ODE** – in October 2017 IOG announced ODE's appointment in multiple key roles; as a provider of extensive operational and technical support, the operations and maintenance service provider. ODE will be responsible for the operational management of all IOG's assets including the Thames pipeline whilst IOG remains as 100% owner and operator of the assets. ODE will also host the operational base close to the Bacton terminal where the Thames Pipeline delivers its gas. Pre-FID costs are to be fully deferred while pre-first gas costs are to be 50% deferred to first gas. Given this primarily relates to operations the impact on development capital is likely to be limited.

- Offtake – we expect IOG to further reduce its upfront capital requirements via a prepay/offtake agreement which would bring in cash up front for future production without a dilutive impact. IOG has announced that is actively engaged in securing such a deal.

Project Capex, Funding Requirements

	Contractor	Capex (Including Contingency 10%)	Proportion of Total Bill	Assume 50% Deferral
Drilling	TBD	147	33%	74
Subsea	TBD	111	25%	55
Platforms	Heerema	104	23%	52
Services	Schlumberger	87	19%	43
Operations	ODE	17	4%	9
Total		466		233
			90/10 (Debt:Equity)	23

SOURCE: Company Data, VSA Capital Research.

With deferrals from major contractors of at least 50% on key areas of project funding, IOG are likely to significantly reduce the upfront funding requirement. Although Schlumberger has not declared details of deferrals on its contract, we have assumed 50% in line with other contractors. It remains to be seen whether further contractor deferrals can be secured for drilling and subsea work, however, this may also be achievable via offtake agreements. IOG therefore has significant scope to further reduce the upfront funding requirement.

From this we assume a 90:10 debt to equity ratio leaving an equity component of around £23m, which is manageable in our view given the current capitalisation of the company. We note the recent **Tulip Oil** bond placement of EUR87m which covered the entire attributable upfront capex of EUR47m as well as refinancing outstanding loans, a 100% debt financed project. The five year bond, priced at 3 month Euribor plus 8.5%, will enable Tulip to develop the Q10 gas field in the Dutch North Sea, of which it owns 60%, using an unmanned platform tied back to the TAQA operated P15d platform. The field is expected to produce up to 22.6bcfpa with an 11 year project life. The similarities to the IOG project are therefore clear, in our view, and this funding demonstrates that the market is opening up to such financing structures.

Short Term Funding

IOG tends to support working capital spending via its outstanding loan facilities and holds a minimum of cash on hand drawing down facilities only as necessary. The company is fully funded to FID. The outstanding facilities are as follows;

- London Oil & Gas (1) – Also in December 2015 IOG secured loan facilities from London Oil & Gas of £2.75m and £0.8m also with interest rolled up and charged at LIBOR +9%. Secured against North Sea assets. The loans mature in H1 2019.
- London Oil & Gas (2) – Convertible loan of £10m agreed in January 2016 which can be drawn down in tranches. IOG is assumed to have fully drawn this loan. The loan is convertible at 8p/sh. and is therefore strongly in the money. This implies potential dilution of 125m shares (110m currently in issue). Interest is charged at 9% rolled up and the loans secured against the North Sea assets. Included in the terms of the loan is LOG’s ability to appoint two NEDs to the board. Currently these are Martin Ruscoe and Charles Hendry. The loans mature 36 months after draw down of the relevant tranche although LOG has the sole right to extend maturity of any tranche by 12 months.
- London Oil & Gas (3) – Convertible loan facility of up to £10m agreed in February 2018. The facility will carry a coupon of LIBOR +9% with principal and accrued interest repayable 36 months after the drawdown of the relevant tranche. The facility is secured against all current and future assets of the company and has senior security status alongside the other LOG loans. The facility is subject to shareholder approval, received in March 2018, although IOG may drawdown up to £1m without approval. IOG may elect to draw down the facility no more than once each

month and in a sum not less than £500k and up to £1m. Any draw down may be accepted or declined by LOG. Funds drawn down are convertible at 19p.

- Skipper Contractors – In December 2017 IOG announced that it successfully concluded discussions in relation to the outstanding liabilities for the Skipper well drilled in 2016. Of the total £6.78m outstanding, £4.47m was deferred, £1.87m converted into shares at 19p with the remainder paid from existing facilities.
 - The £4.47m that has been deferred will now be repaid at the sooner of August 2018 or Field Development Plan Approval. Interest will occur at LIBOR plus 9% and the company may repay early without penalty.
 - Regarding the conversion of shares IOG has secured supportive terms with regards to the conversion of shares. **GE Baker Hughes**, which has agreed to convert £1.75m plus a fee of £0.1m has also agreed that if it wishes to sell its shares it may only do so in an orderly market with an agreed maximum of one quarter of the total number of shares issued in each quarterly period in 2018. Furthermore, in the event that any shares are sold higher than 19p, the excess will be used to pay down any further outstanding amount owed to Baker Hughes by IOG. A further creditor who has agreed to convert £124k has similar terms although share sales are limited to one third each month over the first quarter of 2018.

We believe that following the acquisition of the Thames Pipeline and publication of the project CPRs, management have created a clear path to production. Consequently we believe that it is in creditors interest to facilitate its execution. This may come in the form of a deferral or conversion of a portion of the outstanding liabilities into equity.

Board Expertise Key to Development Progress

IOG is currently in an unusual position as a junior company; preparing to develop a sizeable project whilst retaining 100% ownership and control of its asset base without farming out to other juniors or majors. However, this is a key tenet of the investment case in our view and it is largely realisable due to the strength and experience of the board and senior management team who have a wealth of direct and successful experience in developing similar projects in the North Sea.

We highlight the previous success of, Non-Executive Chairman, Mark Routh and, CEO, Andrew Hockey. Mark Routh was founder and CEO of **CH4 Energy** which began with an initial investment of £1m, primarily from **3i** and was ultimately sold to **Venture Production** in 2006 for £154m having successfully realised a North Sea gas hub strategy focused on the Markham and Chiswick gas fields. Andrew Hockey was a founder and managing director of **Fairfield Energy** which was founded in 2005 with a US\$200m investment from **Warburg Pincus** and **Kern Partners** to exploit North Sea tight gas plays and in particular the redevelopment of dormant discoveries and stranded assets. The focus of development was Clipper South which exceeded production expectations with four horizontal hydraulically stimulated wells increasing production from 3-5mmcf/d to in excess of 35mmcf/d.

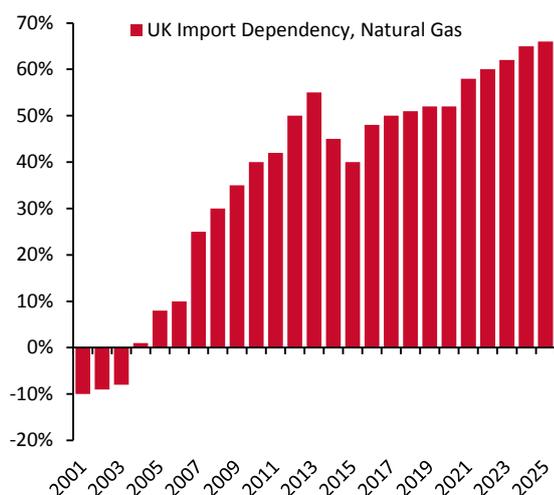
With successful execution experience of hub strategies and tight gas production in the North Sea, we believe that IOG's management team puts it in a strong position to successfully execute its development plans. As well as for the successful execution of the strategy we believe that investors should consider the alignment of management incentives with shareholders and the current capital structure and short term funding situation.

Currently the BoD and senior management own c18% of IOG. However, certain short term financing instruments have acted as a cap on share price performance, in our view. The announcement in December in relation to the Skipper loans represents a key resolution which will enable management to focus on project development. We believe that the creditors recognise the fact that their interests are better served whilst the interests of management are aligned given the importance of this management team in realising the full asset potential. With maturities now more closely aligned to the project development we believe that creditors and shareholders interests are now closely aligned which will benefit the company's ability to advance the broader project funding discussions, in our view.

UK Gas: Energy Security and Pricing Outlook

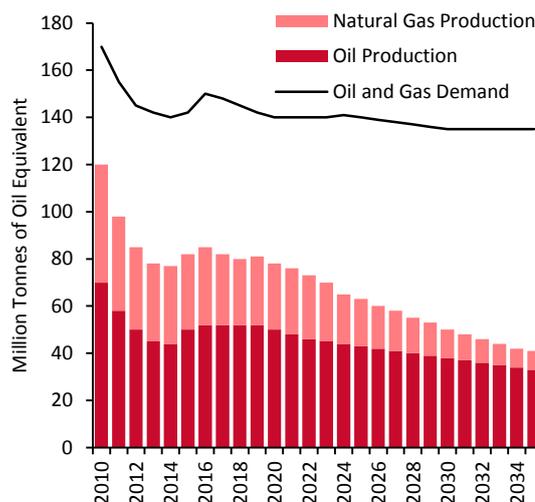
The UK currently relies on imports for around 50% of its requirements and this is expected to increase over the short to medium term. Particularly following recent forecasts which show significant strain on the UK's energy supply owing to the government's decision to ban combustion engines for vehicles by 2040, peak grid demand is expected to be up to 31GW higher owing to the influx of electric vehicles onto the UK's roads. Peak demand is currently 61GW. Although renewables, with the advent of commercially viable large scale storage solutions, are expected to take an increasing share of the market, we expect gas to retain a prominent position as a source of UK energy. Although with just 3GW projected by 2030, traditional sources of energy will remain important over the medium term.

UK Gas Import Dependency



SOURCE: UK BEIS, VSA Capital Research.

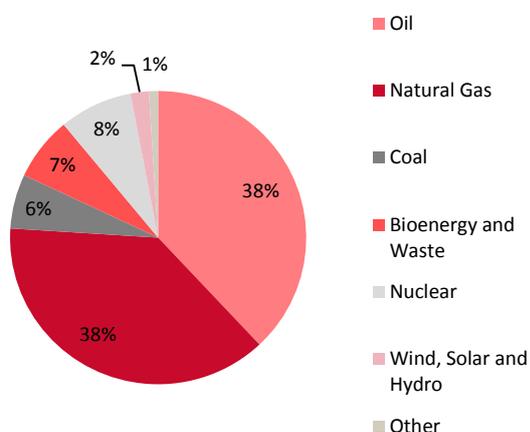
Indigenous Production Forecast to Decline



SOURCE: OGA, VSA Capital Research

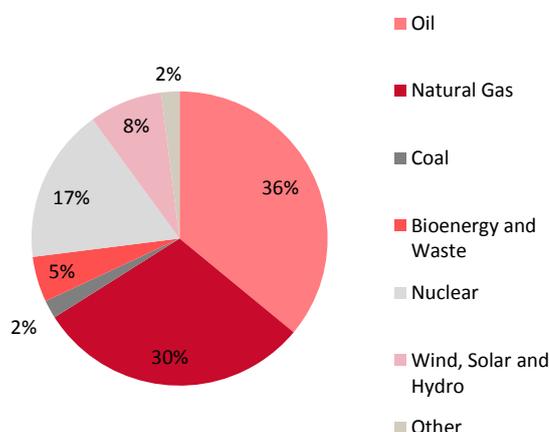
UK Government forecasts envisage that by 2032 oil and gas demand will continue to meet the majority of the UK's energy needs (135Mtoe) making up just short of 70% of energy demand while renewables will make up the remainder. The continued importance of natural gas for the UK's energy has prompted the UK Government's Oil and Gas Authority to promote to schemes in relation to North Sea Gas which encourage development of North Sea tight gas as well as extending the economic life of extending assets. These schemes are known as "Maximising Economic Recovery Strategy for the UK" and the "Southern North Sea Tight Gas" strategy.

UK Primary Energy Demand by Fuel Type 2016



SOURCE: OGA, VSA Capital Research.

UK Primary Energy Demand by Fuel Type in 2035



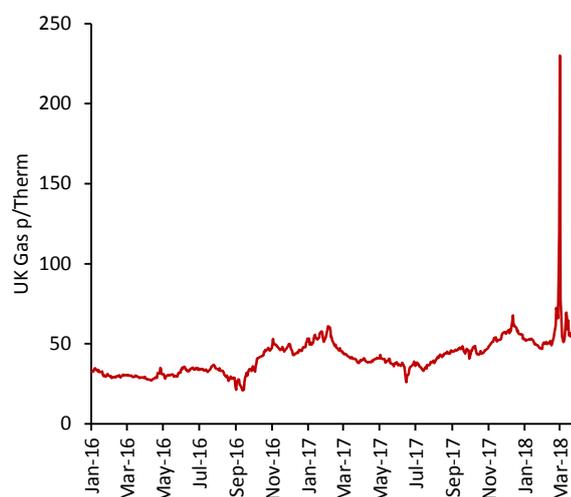
SOURCE: Company Data, VSA Capital Research

The UK's energy security position has been highlighted by the recent temporary suspension of the Forties pipeline. The pipeline which carries around a third of the UK's total offshore natural gas output was shutdown during December following damage to the pipeline. The shutdown impacted both trade and industrial output with the consequent increase in gas imports and fall in oil exports resulting in a widening of the UK's trade deficit by £3.8bn to £10.8bn during Q4 2017. Although this kind of supply shock is infrequent it highlights the benefits of diversifying the UK's internal natural gas supplies via projects such as IOG's Southern North Sea gas project.

UK Natural Gas Pricing

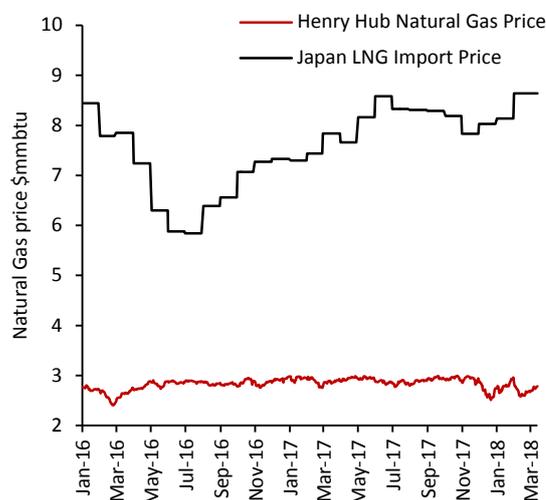
With indigenous production forecast to decline, driving an increased reliance on energy imports, there is a clear incentive for the UK Government to provide support for projects such as IOG's. Owing to heightened tensions with Russia we believe that reduced import reliance would be preferable for the UK energy sector which implies investment into the North Sea as well as LNG. Consequently, we believe that the pricing outlook for natural gas is robust. Therefore we think that our assumption of 45p/therm provides a base case scenario and is close to the floor in terms of the long term outlook. With the project demonstrating robust returns based on this price level this, in our view, underpins the project's potential.

UK NBP Gas Prices



SOURCE: Company Data, VSA Capital Research.

Henry Hub & Asian Prices 2009-17



SOURCE: Company Data, VSA Capital Research.

Given the spread in global pricing and the cost of, liquefying, shipping and regasifying natural gas we believe that US imports are likely to become an important component of European and UK gas supply. Currently US LNG export capacity is expected to reach 90bcm by 2020, which could supply 20% of European demand, while Europe's regasification capacity is approximately 200bcm/yr. However, the cost base and high capital costs associated with LNG require significant prices to incentivise these exports, particularly given strong Asian LNG pricing which peaked at close to US\$10/mmbtu (72p/therm) in 2017.

Our build-up of LNG import costs to the UK is based on Henry Hub pricing, liquefaction costs, shipping costs and regasification costs. The marginal cost for natural gas production in the US is currently around US\$3/mmbtu (US\$21.7p/therm) although since 2009 Henry Hub gas prices have averaged US\$3.77/mmbtu (27p/therm), liquefaction costs are estimated at an average of US\$3/mmbtu (21.7p/therm) whilst **Tamera Energy** have provided analysis of 2017 shipping rates indicating average costs from the Gulf Coast to the UK at US\$0.95/mmbtu (7p/therm) while the University of Oxford estimates average regasification costs to be around US\$0.7mmbtu (5p/therm). This adds up to 55-60.5p/therm; above the current forward NBP curve. This highlights that LNG imports will be viable only to the lowest cost natural gas producers while Asian LNG prices trade at a premium.

Valuation

We have used a sum-of-the-parts methodology to value the Southern North Sea project developments with the Vulcan Satellites, and Blythe hubs forming our core NAV. These are expected to be the first developments undertaken by IOG on which a CPR demonstrating 2P reserves and strong economics was recently completed. These developments are contingent on IOG securing development capital funding. This is the base case scenario for our assumptions.

We also include Harvey in our contingent NAV, where again a CPR was recently completed, although this was with lower confidence with 90 BCF Prospective Resources being defined at the best estimate. This is the resource currently within IOG's license area and there is therefore potential upside should IOG gain an expanded license. For our EMV of Harvey we use the Elgood field as a proxy given its close proximity and similar anticipated operational development programme. We have not included Skipper in our valuation as it was written down earlier this year following test work results that called into question the commercial viability of the project in the pricing environment earlier this year. However, we recognise that the pricing environment for crude oil has strengthened in recent months. The asset could therefore be reviewed and a change in project status could provide further upside potential for IOG.

NAV Table

	Timing	Type	Unrisked mboe	Equity %	CoS %	EMV £m	Net risked p/sh
Prospects							
Blythe Hub	2019	Gas 2P	0.5	100%	60%	29	12
Vulcan Hub	2019	Gas 2P	1.1	100%	60%	186	73
Development NAV			1.6			215	85
Harvey	2021	Gas PR	0.9	100%	25%	25	6
Contingent NAV			0.9			25	6
Total NAV			2.5			240	72

SOURCE: Company Data, VSA Capital Research.

The current outstanding number of shares is 120.2m, however, given the potential dilution associated with the LOG convertible loans we have included this in our analysis. With a conversion price of 8p/sh and 19p/sh. this implies further shares to be issued of 125m and 52.6m on a fully diluted basis assuming the facilities are fully drawn down. Consequently our target price is based on full conversion of the LOG loans as well as 25.3m worth of options and warrants, implying a total of 297.8m in ordinary shares on a fully diluted basis.

Unlike the CPR analysis, we have incorporated the additional benefit of IOG's c£33m accrued tax losses, plus 10%pa in line with the Ring Fence Expenditure Supplement (RFES). Otherwise our assumptions are in line with the CPR on tax, using the UK 30% corporation tax on profits and the supplementary profits tax of 10%.

We have used a gas price of 45p/therm, in line with the five year average, and US\$60/bbl for oil.

IOG is an unusual position for a junior O&G company holding 100% of its development ready assets. The development plan which focuses on a hub strategy offers attractive economics, in our view, with management having taken full advantage of the South North Sea's existing infrastructure, in the form of the Thames Pipeline. Ownership of this asset makes the economics of the project attractive by significantly reducing development capital and the development plan realisable, in our view.

We also note from the NAV table above that the potential upside to our valuation is significant. Although the outstanding loans to creditors have held back share price performance, in our view. We believe that our analysis demonstrates that the development plan has strong potential with attractive upside, offering investors' strong returns even on a fully diluted basis.

We issue a BUY recommendation and a 72p/share target price.

Board of Directors

Mark Routh; Non-Executive Chairman

Entrepreneur, founder and MD of CH4 Energy Ltd a private equity backed Oil and Gas Company which became a North Sea operator. CH4 was formed with £1 million funding from management and 3i in 2002 and sold to Venture Production plc in 2006 for £154.4 million, providing 3i with a record 7.3 multiple return on its investment. Mark has over 30 years' experience in the oil & gas industry, in executive management, commercial management, and petroleum engineering. Prior to founding CH4 Energy served 10 years with Hess, 6 years with BP and 5 years with Schlumberger in South East Asia and the North Sea. Mark has an MSc in Petroleum Engineering, Imperial College. Non-executive Chairman of Warrego Energy Limited a company with onshore gas assets in Western Australia.

Andrew Hockey; Chief Executive Officer

Having worked in the industry for 35 years, Andrew Hockey has significant sector experience. He has a technical background with a degree in geology from Oxford University and a Master's Degree in petroleum geology from Imperial College London. Until the end of 2015 Andrew was General Manager of Business Development at UKCS oil and gas exploration and production company Fairfield Energy Limited which he helped to found in 2005. Andrew led the team to acquire Clipper South as an undeveloped discovery from Shell and Esso and then subsequently managed its development via farm down and funding through to first gas in 2012. Andrew is now a non-executive director of Fairfield Energy and a founder of its parent company, Decom Energy Limited. Andrew has also served on the board of AIM-listed Sound Energy plc, an upstream company with onshore interests in Italy and Morocco, where he was a Non-Executive Director from 2011-2015 and Chairman from 2012-2014.

Martin Ruscoe; Non-Executive Director (LOG Nominee)

Martin has over 40 years' experience in the Financial Services Industry. Martin initially worked for a top 20 life office for 25 years, the last 9 years as Chief Investment Officer being involved in all forms of investment, taxation and new product development within the company. Following a takeover he left to move to the broking side of the investment community working for Swiss Bank, Citicorp and Smith New Court. Martin then spent 12 years with Charterhouse Securities who were voted number one in the small cap market and then spent 6 years with Seymour Pierce, at the time the largest Aim Broker in London. Martin has vast experience and has overseen in excess of 200 institutional fund raisings including new listings, placings and rights issues. He currently holds the following Non-Executive Director positions: Surrey Save Credit Union, London Oil & Gas, Modular Airspace Systems, London Group PLC and Independent Oil and Gas.

Rt Hon Charles Hendry; Non-Executive Director (LOG Nominee)

Charles Hendry was Minister of State for Energy from May 2010 until September 2012. Since leaving ministerial office he has undertaken a wide range of roles, including as President of the British Institute of Energy Economics, chair of the Forewind Consortium from 2013-2015, and in 2016 he was appointed by the UK Government to lead a review into the strategic case for tidal lagoons and their role in the UK energy mix. Charles Hendry is a nominee of London Oil and Gas Limited, a committed funding partner of IOG.

Appendix 1: Financial Statements

Profit & Loss (Reported), £'000

	2014A	2015A	2016A
Other Administrative Expenses	(693)	(833)	(279)
(Impairment)/ Reversal of oil and gas properties	(8,254)	6,169	(20,013)
Impairment of creditors		-	307
Exploration costs written off	(641)	(10)	(712)
Net gain on settlement of liabilities	-	-	458
Foreign Exchange Loss	(77)	(65)	(299)
Other	(1,343)		
Operating Profit	(11,008)	5,261	(20,538)
Finance costs	(1,137)	61	(899)
Profit before taxation	(12,145)	5,322	(21,437)
Taxation	-	-	-
Profit for the year	(12,145)	5,322	(21,437)

SOURCE: Company data, VSA Capital Research.

Cash Flow (Reported), £'000

	2014A	2015A	2016A
Profit for the year	(12,145)	5,322	(21,437)
Depreciation and amortisation	-	-	4
Impairment of intangible oil and gas assets	8,254	(6,169)	20,013
Impairment of creditors	-	-	(307)
Gain on settlement of liabilities	-	-	(73)
Share based payments	1,343	321	206
Movement in trade and other receivables	114	(136)	(146)
Movement in trade and other payables	118	187	(853)
Interest and Financing fees	100	123	899
Impairment (gain) of derivative financial assets	896	(204)	-
Foreign exchange loss	77	65	299
Net cash used in operating activities	(1,247)	(491)	(1,395)
Purchase of intangible oil and gas assets	(520)	(494)	(3,784)
Purchase of intangible assets - other	-	-	(3)
Purchase of PP&E - other	-	-	(30)
Acquisitions	-	-	(2,834)
Net cash used in investing activities	(520)	(494)	(6,651)
Proceeds from issue of ordinary shares	450	345	728
Costs of share issue	-	(10)	-
Net proceeds from loans received	517	237	7,542
Amounts received for derivative financial instruments	78	512	-
Net cash from financing activities	1,045	610	8,270
Increase in cash and cash equivalents in the year	(722)	(375)	224
Cash and cash equivalents at the start of the year	1,120	398	23
Cash and cash equivalents at end of the year	398	23	247

SOURCE: Company data, VSA Capital Research.

Balance Sheet (Reported), £'000

	2014A	2015A	2016A
Intangible assets: exploration and evaluation	7,513	14,818	5,825
Intangible assets: other		-	2
Property, plant and equipment: development and production		-	7,506
Property, plant and equipment: other		-	24
Total non-current assets	7,513	14,818	13,357
Other receivables and prepayments	-	1,493	285
Cash and cash equivalents	310	23	247
Total current assets	398	1,516	532
Total assets	708	16,334	13,889
Loans	461	1,460	4,076
Trade and other payables	194	1,105	5,782
Total current liabilities	655	2,565	9,858
Loans	-	-	4,733
Trade and other payables	1,586	293	-
Provisions	-	-	3,598
Total non-current liabilities	1,586	293	8,331
Total Liabilities	2,241	2,858	18,189
Called up equity share capital	692	787	1,093
Share premium account	17,163	17,649	20,460
Share based payment reserve	1,754	3,347	2,885
Accumulated losses	(13,629)	(8,307)	(28,738)
Total Equity	5,980	13,476	(4,300)
Total equity and liabilities	8,221	16,334	13,889

SOURCE: Company data. VSA Capital Research.

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Equities breakdown: 31 December 2016	Spec. BUY	BUY	HOLD	SELL
Overall equities coverage	25%	75%	0%	0%
Companies to which VSA has supplied investment banking services	25%	75%	0%	0%