

Jade Gas Holdings Limited (ASX:JGH)PELTON
CAPITAL

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Recommendation**Initiating Coverage - SPEC BUY****Price Target: \$0.28 (Fully Diluted)****Company Statistics**

| | |
|------------------------------|--------------|
| Share Price | A\$0.049 |
| 12 Month Trading Range | A\$0.04-0.08 |
| Market Cap (undiluted) | A\$68.5m |
| Enterprise Value (undiluted) | A\$65.7m |
| Listed Shares | 1,397m |
| Options (unlisted) | 170.5m |
| Performance Rights | 25.0m |
| Cash Balance (*est.) | A\$3.0m* |
| Debt | A\$0.2m |

Major Shareholders

| | |
|------------------------|--------|
| GM Ventures | 23.92% |
| UB Metan LLC | 9.66% |
| Scor Go Luath Limited | 5.75% |
| E&E Hall Pty Ltd | 3.95% |
| Daniel Eddington | 3.41% |
| Directors & Management | 34.90% |

Directors & Management

| | |
|---------------------|--------------------|
| Mr Dennis Morton | Non Exec Chairman |
| Mr Chris Jamieson | MD & CEO |
| Mr Joe Burke | Executive Director |
| Mr Daniel Eddington | Non Exec Director |
| Mr Peter Lansom | Non Exec Director |
| Mr Mark Pitkin | GM Technical |

Share Price Performance**Key Investment Highlights**

- **Global energy crisis impacting supply & demand for natural gas has created an opportunity for all gas explorers and producers. Gas is now recognised as being an essential transitional step on the way to fully renewable energy sources**
- **Mongolia is poised for a new domestic energy industry: Government JV aligned and determined to build a domestic gas market for independent and cleaner energy**
- **JGH has established the potential for a substantial gas field at Tavan Tolgoi over a 45km strike**
- **Demonstrated market demand with offtake interest from Mongolia's largest gas distributor, a local major mine developer and the strong potential for more to come**
- **Globally significant gas exploration results delivered with high gas content and pipeline spec composition. JGH has already booked an initial sizeable coal bed methane unrisks Gross 2C Contingent Resource (Aug 22) of 246Bcf highlighting the enormous potential of the TTCBM Project**
- **Experienced management team with substantial exploration and production experience: Key board members have strong experience in recognising and developing major international resource projects. Exploration success has largely been driven by the quality of the TTCBM Project permit, and the team and their ability to execute**

MONGOLIAN GAS: A NEW SECURE & ROBUST SOURCE OF CRITICAL ENERGY

A Rapidly Emerging Large CBM Gas Project Strategically Located in the South Gobi Region Surrounded by >500MW of Energy Demand - Positions Jade as the Key Player in the Aggressive Push for Cleaner Fuel Sources in the Region

Participating in the Global Shift towards Cleaner Fuels in a Region Urgently Seeking Greener Solutions to Support its Energy Needs

Jade Gas Holdings Limited ("JGH" or "The Company") is focused on participating in the global momentum shift towards the use of cleaner fuels in the energy supply chain. Natural gas has now emerged as playing a critical part in the transition towards cleaner energy to support industry and government policy and commitments. These market conditions now provide a positive robust backdrop for JGH as it advances its large strategic Coal Bed Methane (CBM) projects in Mongolia.

A High Quality Strategically Located CBM Project Portfolio

JGH is a gas explorer and appraiser holding four high quality Mongolian CBM permits covering ~19,000km² located within existing large coal basins. The Company's flagship Tavan Tolgoi Coal Bed Methane (TTCBM) Project, a 60/40 JV with Mongolian State-owned entity Erdenes Methane LLC covering 665km² is located over the world class 6Bt Tavan Tolgoi coalfield in Mongolia's South Gobi region. Standout early drilling success has already enabled JGH to book a maiden unrisks Gross Contingent Resource of 246Bcf at the project. JGH's other majority interests in three other large permits include Shivee Gobi (100%) covering 8,317km², Eastern Gobi (100%) covering 9,691km² and Baruun Naran (66%) in JV with Khangad Exploration LLC a subsidiary of Mongolia Mining Corporation – HKSE:0975).

Standout Well Success at TTCBM Provides Solid Base For Pilot Operations Planned to Commence Q1 2024

In 2022 JGH enjoyed substantial exploration success essentially proving out its value thesis with a strong well success rate at the TTCBM Project delivering impressive results across a gas play that now extends over a 45km strike. Well highlights include gas contents of 12-18m³/t, notable thick gassy coal zones averaging 60m and up to 98% methane composition, already considered pipeline spec. Such has been the early success that the Company has now commenced the establishment of a pilot production operation which, all going to plan will come on line in Q1 2024. This pilot program aims to demonstrate the tremendous flow rates & production from a relatively small portion of the field which should provide investors with share price catalysts as the company establishes reserves and provides field development updates prior to 'first gas'.

Gas Supply MOU Agreements Signed With Private Entities & Listed Companies

We view the TTCBM Project as significant when compared with CBM projects globally, such as those in the Surat/Bowen Basin in Queensland. With the TTCBM Project's demonstrated substantial gas columns, it comes as little surprise to us that the Company has already attracted initial offtake interest from Mongolia's largest gas distributor (and substantial JGH shareholder), UB Metan LLC and nearby gold/copper developer, Xanadu Mines Limited (ASX: XAM). Both require substantial near term supply. We believe however these two groups are simply early movers and anticipate other groups will approach JGH in the near future as JGH has identified major commercial energy demand on its doorstep to the tune of >500MW, with these parties seeking a domestic gas component for baseload power.

We anticipate JGH will continue to increase its contingent resources and establish reserves in CY2023/24. Our two key pressing questions at this early juncture are 1) How big will TTCBM's gas resource be? and 2) What price target could we place on JGH post contingent resource upgrade and gas production?



Company Overview

JGH's flagship TTCBM Project is a JV between JGH (60%) and Erdenes Methane LLC (40%), a corporate representative of the Mongolian Government.

We view this arrangement favourably in that with the Mongolian government on board with a vested interest, we anticipate the project will not experience any delay in the review and approvals process

Jade Gas Holdings Limited ("JGH" or "The Company") is an Australian headquartered gas exploration company focused on the Coal Bed Methane (CBM) potential of Mongolia.

JGH's flagship project is its CBM gas project cited over the Production Sharing Agreement (PSA) area of the infamous world class 6Bt Tavan Tolgoi Coal deposit named TTCBM Project located in the South Gobi region of Mongolia.

JGH will operate and manage the Project through its subsidiary Methane Gas Resource LLC (MGR), a joint venture (JV) company partnering with Erdenes Methane LLC (EM), the corporate representative of the Mongolian Government. The JV was formed with the intention to explore, develop and produce gas from the TTCBM Project permit (JGH 60%, EM 40%).

A Sizeable Portfolio of Mongolian CBM Gas Projects

JGH holds a sizeable portfolio of Mongolian CBM permits with four high quality permits covering ~ 19,000 km². Each one of those permits is located in existing major coal basins.

Right: General Map of Mongolia With JGH's CBM Licence Interests Marked.

Source: Company



Below: Wellhead at Red Lake 6 at the TTCBM Project.

Source: Company



The TTCBM Project incorporates the majority of the 6Bt Tavan Tolgoi coal mine, which has been studied in detail by western consultants.

Cooperation between mine and JGH to de-gas mining areas ahead of mining operations likely to occur

With the Production Sharing Contract valid for 30 years we anticipate the project supplying multiple customers for many years

Tavan Tolgoi Coal Bed Methane (TTCBM) Project

The TTCBM Project (JGH holding 60% & Erdenes Methane LLC 40%), covering a permit area of 665km² is considered JGH's flagship project. The permit incorporates the majority of known Tavan Tolgoi coalfield and interpreted extensions which, is currently believed to extend over a strike length of around 45km in an east-west direction.

The TTCBM permit also advantageously incorporates the operating Tavan Tolgoi coal mine. At 6Bt Tavan Tolgoi is one of the world's largest largely unmined coking coal deposits. We say the project advantageously incorporates the mine in that we know from our own experience the mine's geology, including its +13 coal seams, has been studied and correlated in great detail by western coal consultants. This provides JGH with additional detailed technical information on the coalfield in addition to its well data.

In addition, as is common practice in most globally significant coal mining operations throughout the world, for safety reasons the Tavan Tolgoi operation needs to de-gasify the coal seams ahead of the mine expansion to minimise the potential for any explosion or fire should an ignition event occur. This is normally done by drilling boreholes ahead of mining and venting or flaring the gas. JGH will work with the mine to drill and capture the gas with both parties benefiting from the cooperation.

The current CBM Production Sharing Agreement allows for a period of gas exploitation for up to 30 years. With TTCBM located within a long life resource rich area with a rapidly growing requirement for cleaner and reliable power, estimated at over 500 MW, we are excited about the potential of this project to supply several customers for many years.



Right: Licence Plan of The TTCBM Project with the gas prospective areas of the coalfield marked. Also marked are the wells currently drilled to date

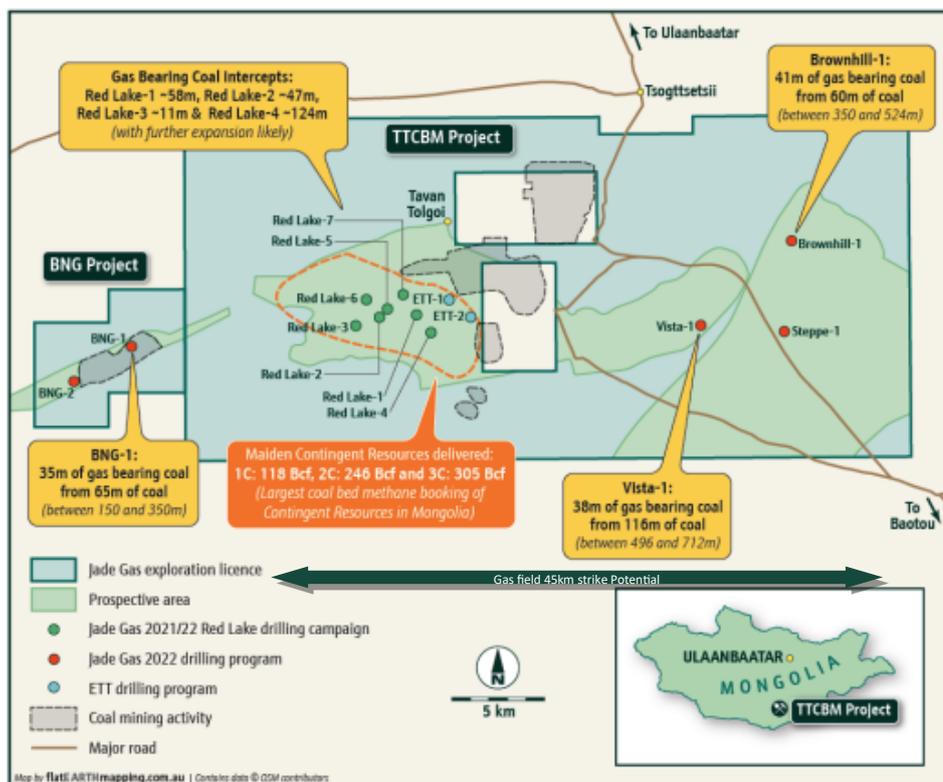
The plan highlights a number of important key points and observations

Firstly, it highlights the drilling to date (Red Lake) has only covered a relatively small area of the entire permit. Red Lake in 2023 will be further drilled and well tested with the JV planning to establish reserves prior to the construction of a gas processing plant, with first gas scheduled by Q1 2024

The plan also highlights the additional prospectivity of the coalfield 15-20km to the east, with encouraging results at Vista-1 and Brownhill-1 wells (page 4), which had 38m and 41m gas columns respectively

Similar impressive, westerly extensions established from exploratory wells drilled on the Company's adjacent Baruun Naran licence (Page 4) are also shown. BNG-1 and BNG-2 encountered gas columns of 35m and 21m respectively

Source: Company



Red Lake Area of the TTCBM Project Permit, the Focus of Current Pilot Plant Program

Two drilling programs focused on the Red Lake area of the TTCBM Project permit completed in 2021 & 2022 delivered impressive results from 7 wells. Highlights of these results are provided on page 4.

The better than expected results have allowed the Company to establish an early 2C Contingent Resource of 246Bcf (Table 1 below)

| TTCBM Project (Red Lake area only) | Unrisked Contingent Resources (Bcf) | | |
|------------------------------------|-------------------------------------|-----|-----|
| | 1C | 2C | 3C |
| Gross Recoverable Gas | 118 | 246 | 305 |
| Net Recoverable Gas | 71 | 148 | 183 |

This is in our view a sizeable initial resource from just this relatively small area of the TTCBM Project permit. To put it into perspective, we understand this resource alone is likely sufficient to supply more than 100MW of power for several decades. The prospective resource estimate has the TTCBM Project potentially containing circa 1TCF of gas (Table 2 below).

| 2U Gross Prospective Resources | | | |
|--------------------------------|------------------|------------------|------------------|
| | TTCBM Project | Shivee Gobi | Eastern Gobi |
| Tcf | 1.0 ¹ | 2.0 ² | 3.4 ² |

Right: Table 1 Current Resource Table for the Red Lake part of the TTCBM Project permit only

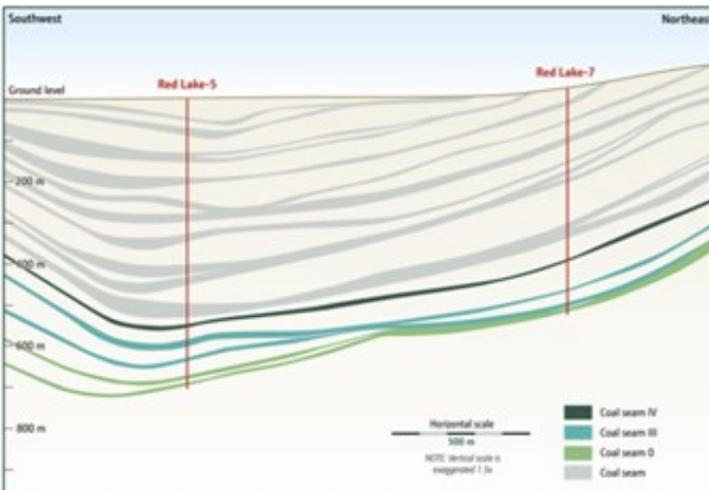
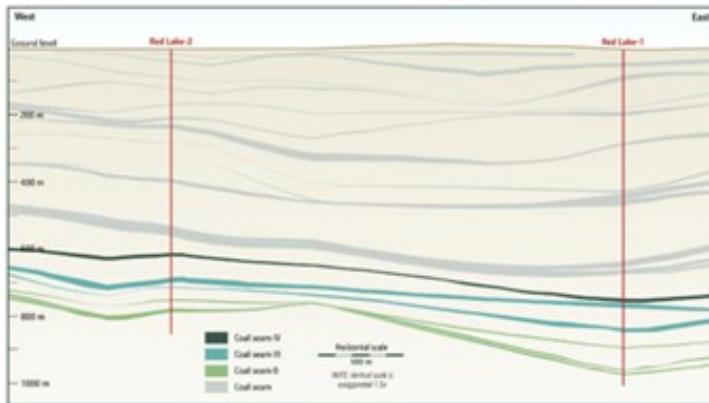
Source: Company

Right: Table 2 Current Resource Table for the overall Gross Prospective Resource potential for the TTCBM Project, Shivee Gobi and Eastern Gobi Projects

Source: Company



Better Than Expected Early Exploration Success at TTCBM Has Allowed the Early Establishment of a Sizeable Resource & A Rapid Move to Pilot Production Planned for Q1 2024



Above: Two typical cross sections through the Tavan Tolgoi coalfield in the Red Lake area. The sections show the coalfield is made up of multiple coal seams of varying thickness, some of which (often the deeper thicker ones) are more gas bearing than others i.e. 0, III & IV seams are currently being targeted for vertical and horizontal well drilling

Source: Company

Right: Well result highlights from the TTCBM Red Lake area as well as the Eastern Zone and Western Zone (Baruun Naran) extension areas. The intersections highlight the tremendous thickness of gas bearing coals over tens of kms

To put these results into perspective, we note that explorers in the Surat-Bowen basin are often pleased with a 5 to 7m gas bearing coal intersections

Well Highlights:

Red Lake-1

- Total depth (TD) at 1,012 metres; 145 metres of coal core recovered;
- 58 metres gas bearing**
- **Gas composition: 98% methane in seam III and 0,**
- **92.5% methane in seam IV;**
- **gas content of 12-18 m³/t**

Red Lake-2

- TD at 790 metres; 131 metres of coal core recovered;
- 47 metres gas bearing**

Red Lake-3

- TD at 702 metres; 82 metres of coal core recovered;
- 10 metres gas bearing (only seam 0)**

Red Lake-4

- TD at 864 metres; 189 metres of coal core recovered;
- 124 metres gas bearing**

Red Lake-5

- TD at 687 metres; 110 metres of coal core recovered;
- 36 metres gas bearing**

Red Lake-6

- TD at 543 metres; 62 metres of coal core recovered;
- 21 metres gas bearing (excluding seam 0)**
- Fault impacted, future observation well

Red Lake-7

- TD at 501 metres; 75 metres of coal core recovered;
- 62 metres gas bearing**

Western Zone: Baruun Naran BNG-1

- TD at 463 metres; 65 metres of coal core recovered;
- 35 metres gas bearing**

Western Zone: Baruun Naran BNG-2

- TD at 592 metres; 59 metres of coal core recovered;
- 26 metres gas bearing**

Eastern Zone: Brownhill-1

- TD at 524 metres; 60 metres of coal core recovered;
- 41 metres gas bearing**

Eastern Zone: Vista-1

- TD at 592 metres; 116 metres of coal core recovered;
- 38 metres gas bearing**



JGH also holds whole or majority interests in three other Mongolian CBM projects; Baruun Naran, Shivee Gobi and Eastern Gobi. Their prospective potential is large and can be easily overlooked at this time

Right: Table 3 Estimated Gross Unrisked Prospective Resources for Shivee Gobi and Eastern Gobi Projects

Source: Company

Brief Overview of Jade's Other Three CBM Projects

Worthy of mention are JGH's other three majority or wholly owned projects Baruun Naran, Shivee Gobi and Eastern Gobi, all of which are significant in size and potential in their own right (see Table 2 page 3 & Table 3 below)

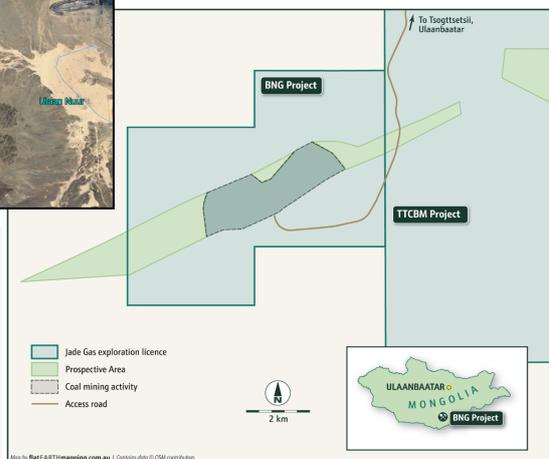
| Permit | Field / Area | Gross Unrisked Prospective Resources (Bcf) | | |
|-----------------------------|------------------|--|--------------|---------------|
| | | 1U (Low) | 2U (Best) | 3U (High) |
| Shivee Gobi | Cretaceous brown | 300 | 1,500 | 4,700 |
| | Jurassic 'hard' | 200 | 500 | 1,300 |
| Eastern Gobi | | 450 | 3,400 | 18,400 |
| Arithmetic Summation | | 950 | 5,400 | 24,400 |

Notes to the table:
 1. Probabilistic methods have been used.
 2. Note the totals are derived by arithmetic aggregation of the resources, as a result RISC cautions that the Low Estimate aggregate quantities may be very conservative estimates and the High Estimate aggregate quantities may be very optimistic due to portfolio effects.
 3. No correction for potential inert content such as N₂ or CO₂ has been applied.
 4. Resource estimates rounded to 50 Bcf.



Above: Satellite view of Baruun Naran Gas (BNG) Project. The image shows the current BNG coal mine located 15km SW of the Tavan Tolgoi Coal Mine seen in the far right corner

Right: Map the BNG Project permit area



Baruun Naran Gas (BNG) Project

JGH (66%), *Khangad Exploration LLC* a subsidiary of HK listed Mongolian Mining Corporation (34%).

BNG is located immediately adjacent to the TTCBM Project and is generally considered as an extension of the overall Tavan Tolgoi coal basin. The permit is centered around the operating Baruun Naran coal mine located 15km SW of Tavan Tolgoi coal mine. The successful drilling of exploratory wells BNG-1 & BNG-2 intersecting thick gas columns (page 4) demonstrated BNG's tremendous prospectivity.

Shivee Gobi Permit

JGH 100% ownership; permit area of 8,317 km².

The permit incorporates the Shivee Gobi coalfield which is host to the large Shivee Ovoo coal mine, a major supplier of coal by rail to Ulaanbaatar's coal fired power stations. With sizeable gassy coal deposits known within the coal basin the CBM potential is believed to be significant.

The permit, which has 2TCF of 2U Gross Unrisked Resources, is also advantageously serviced by Mongolia's main rail corridor.

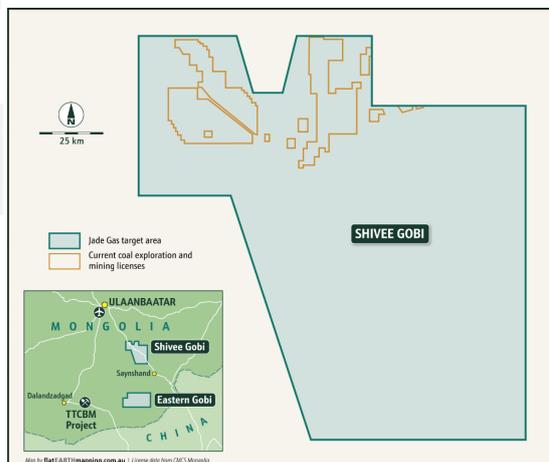
Eastern Gobi Permit

JGH 100% ownership; permit area 9,691 km².

The permit area is known to host large coal deposits with CBM potential believed to be as high as 3.4TCF (2U Unrisked Gross Resources).

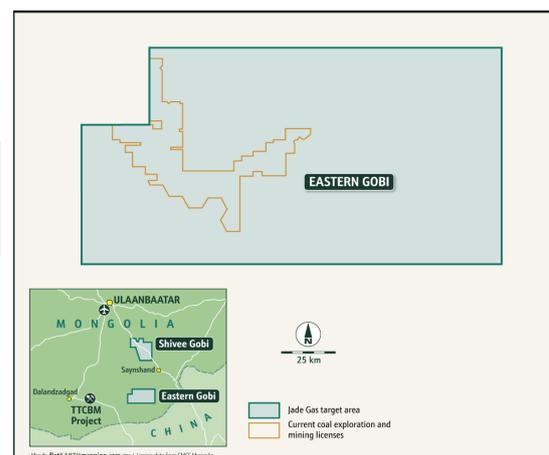
Right: Map the Shivee Gobi Project permit area

Source: Company



Right: Map the Eastern Gobi Project permit area

Source: Company





Major Energy Demand on JGH’s Doorstep Requiring Gas with Several Mining Operations, including Rio Tinto’s Oyu Tolgoi Copper/Gold Mine, Representing Material Offtake Opportunities Totaling >500 MW of Energy Demand in the Coming Years

Mongolia is an immature gas market with no domestic production of its own and the majority of demand met through Russian LNG imports

The market is now playing catchup, aggressively seeking long term reliable supplies of gas to reduce its carbon footprint

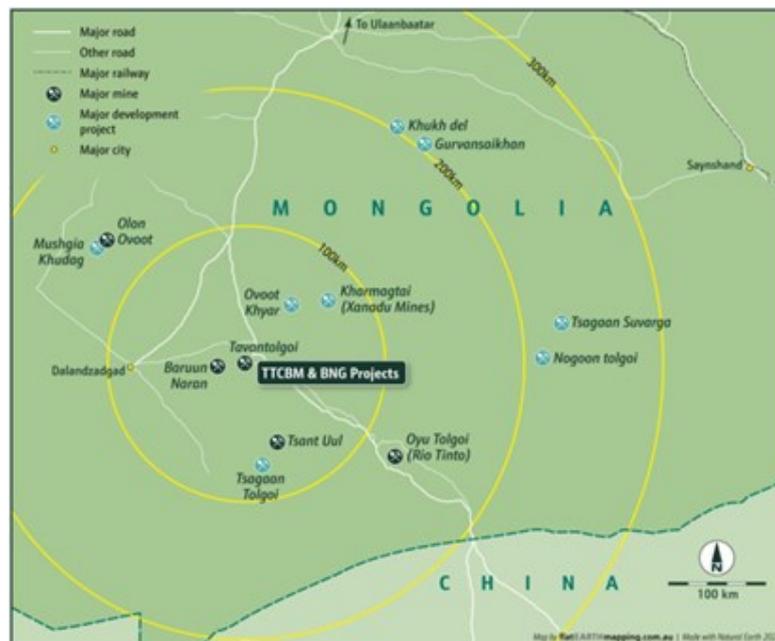
On both security and environmental grounds, Mongolia’s Southern Gobi region, endowed with its mineral and energy wealth, is now seeking a greener alternate domestic energy supply to reduce reliance on imported Chinese coal fired electricity

Right: Map of the Southern Gobi centred around the TTCBM and BNG Projects, highlighting the distance of the projects to current major development and operating projects in the region

Source: Company

Currently the gas market in Mongolia is immature, with nil domestic production and demand met through imports of LNG from Russia. The market is, however, aggressively seeking long term, reliable supplies of fuel that can reduce the carbon footprint of the various industries and mining operations. This is the case throughout the country, but specifically so in the South Gobi region where demonstrated CBM volumes are emerging and demand identified.

Mining operations have been a key component of Mongolia’s GDP for many decades, with the majority of products exported in raw form south to China. Given the demand from northern China, close proximity to the border enhances the economics of mine production, which, in addition to geological prospectivity, is why we see many of the major mines and development projects in this area. Power supply for these operations is predominantly coal fired power, imported from China, an energy flow that the Mongolian Government is keen to turn around, both on energy security and environmental grounds. To ensure that these potential customers (including local grid) are ready to take gas once it is reliably available, JGH has since its inception, been working with several groups to determine requirements and to align expectations. It is this commendable effort that culminated in JGH signing a number of notable high-quality MOU’s during 2021 and 2022.



MOU Signed with UB Metan LLC

Firstly, an MOU was signed with UB Metan LLC (UBM), which is Mongolia’s largest importer and distributor of gas. UBM is an importer and supplier of products across the fuel supply chain for industry in Mongolia. Since 2017, UBM has been importing LNG from Russia and China which, has been sold into the local market dominated by the gas-powered metropolitan bus fleet. The demand for gas has remained high and is poised to expand further as soon as a reliable consistent source of fuel is made available, rather than the *lumpy batching* import process. This is why UBM chose to partner with JGH in 2019 once JGH secured the TTCBM Project permit. Since then, UBM has maintained its investment in JGH contributing into each capital raising, whilst working together with the JGH team on infrastructure requirements and market building strategies including ‘demand surprise’ for LNG conversion of its long haul trucking fleet (see page 8).

Early mover UB Metan LLC has been a strong supporting investor and MOU signer, recognises JGH’s potential to consistently supply large volumes of domestic gas to the Mongolian domestic market in the near to mid term



MOU with Horus Energia, Monhorus International collaborating to supply regional mining customers with energy solutions powered by TTCBM Project gas places JGH with a powerful, product offering platform, to existing and new potential customers

MOU Signed with Energy Solutions Provider Horus Energia, Monhorus International



JGH also signed an MOU with the Mongolian arm of European power generation company Horus Energia, Monhorus International. Monhorus has been actively designing, supplying and implementing small scale power solutions in regional Mongolia since 1997. Under this MOU, JGH will work together with Monhorus to determine the right sized gas turbine solutions (to be powered by gas from the TTCBM Project), for supply to regional mining customers and for production of electricity into the local grid more directly from the gas field itself. This MOU sees JGH well placed with a powerful product offering to new and emerging customers, i.e. a full power solution package can be offered, with gas from the TTCBM Project supplied to power generation equipment from Monhorus.

ASX listed copper project developer Xanadu Mines Limited has been the latest MOU signee

MOU Signed with Xanadu Mines Limited



In late 2022, JGH entered into a meaningful MOU with ASX listed copper developer Xanadu Mines Limited. Xanadu is in the pre-development stage of a large gold and copper mine known as Kharmagtai which is located only 65 km from the TTCBM Project. Importantly, in late 2022, Xanadu received substantial investment from one of the world's largest gold mining companies being the Chinese multinational Zijin Mining Group, which the market took as significantly de-risking the project. The capital injection from Zijin will fully fund the PFS on the Kharmagtai Project which in its 2022 PEA Technical Report detailed the power requirement of up to 110 MW once operational. This is a significant power demand and we believe is likely to be satisfied by a combination of gas, renewables and battery support. Co-operation under the MOU will ramp up during 2023 as technical advancements for both projects continue at pace.

Rio Tinto Oyu Tolgoi in our view has been very slow off the mark in recognising the strategic importance of the TTCBM project as a compelling ESG solution to presenting Oyu Tolgoi as an operation striving to become a greener operation

An Obvious Solution to Rio Tinto's Oyu Tolgoi Power Dilemma

JGH continues to progress additional commercial opportunities with mines in the area. The largest demand centre is the Rio Tinto operated Oyu-Tolgoi Copper-Gold Mine located 120km from the TTCBM project, which we understand has demand for +300MW. The mine is undoubtedly well within commercial distance of the TTCBM Project and we note that the parent of Rio's JV partner in the mine, Erdenes Mongol, is the same parent of JGH's JV partner at TTCBM.

Whilst an agreement signed with Rio is undoubtedly a big prize and would likely provide a share price catalyst for JGH, ironically we now take the view that Rio Tinto needs JGH and the TTCBM greener energy solution more than JGH needs it

Rio Tinto has several solid reasons to switch to gas supplied from TTCBM over its current energy supply being: firstly the operations are currently supplied by coal fired power originating in China. Secondly it has been mandated (since the 2009 Investment Agreement with the Mongolian Government) to power the mine with a domestic supply source and thirdly Rio itself has withdrawn from all energy coal projects worldwide and has proudly presented a global corporate profile of a mining company built on the cleanest energy sources available.

Should JGH be able to close a gas offtake/MOU agreement with Rio for Oyu Tolgoi, this would all set up well for JGH as it further de-risks the TTCBM Project over the course of 2023.

Additional Mining Industry Opportunities

Additional major opportunities for JGH in the region include providing gas and/or gas fired power to the nearby coal mine operations, including the large operating coal mine of Tavan Tolgoi (currently mining 15mtpa coal) operated by Erdenes Tavan Tolgoi located immediately adjacent to the TTCBM Project, as well as mines operated by JV partner Mongolian Mining Corporation Limited.

Opportunities at these coal mines include not just supply of gas to power the operations but also the enormous potential to supply gas in the form of LNG to power the huge fleets of haulage trucks for these mines.



Demand Surprise

With the known potential demand already substantial, we believe the timing and quantum of this could even **surprise on the upside** if JGH's partner UBM is able to efficiently execute its planned roll-out of LNG truck conversions for the long haulage segment of the transport sector in the South Gobi.

It has been estimated that circa 2,000 long-haul trucks make the round trip from the coal mines in the South Gobi to customers in China on a daily basis, almost exclusively diesel fuelled. UBM has commenced a pilot program of converting such diesel trucks to use LNG, dramatically reducing the carbon intensity and cost of the trip.

Right: Loaded Long haul coal trucks waiting at the Chinese border to cross into China.

Circa 2,000 trucks make the 400km round trip daily, almost exclusively diesel fuelled

Source: Company



Diesel to LNG conversion targets for UBM alone has potential to be at least the equivalent demand than that for the large mines discussed in this report

If UBM can achieve their diesel-to-LNG truck conversion targets, the requirement for LNG in the area could be at least equivalent to that of the gas demand for the large mines listed above. The pilot project is currently planned to be supplied from Russian imports, but due to logistics constraints, the import volume from Russia will not be able to meet the projected demand and so would be displaced and supplied by the Red Lake development as soon as producibility is confirmed.

Small scale LNG plant technology is readily available from China and we believe, eminently fundable by the large number of IFI's and other green financiers seeking to support clean energy projects in the region.

Depending on the speed of the take-up, all gas produced from the Red Lake area (as it is understood today) could be consumed through this UBM channel at attractive prices for the producer.



Technical & Commercial Similarities Recognised Between the Early Development of Australia's Surat-Bowen Basin & Mongolia's Tavan Tolgoi Coal Field

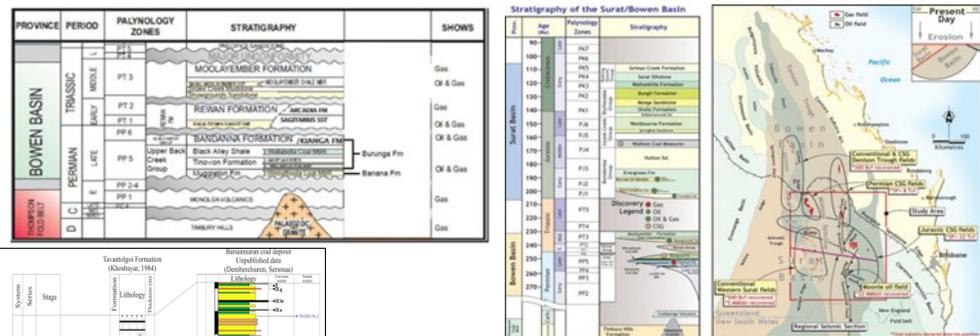
We believe the South Gobi region with Tavan Tolgoi coalfield at its centre is treading a similar commercial path to Australia's Surat & Bowen Basins in its early development

During 2005-2010 we witnessed the rapid development of the Australian coal seam gas sector, driven in part by multiple coal seam gas developments in the Bowen and Surat Basins of Queensland, which supported in excess of 10,000 wells and A\$70bn of infrastructure development connecting Australian suppliers to the global market through three independent LNG facilities. Such developments led Australia to one stage to become the world's largest supplier of LNG ahead of Qatar. During this phase, we saw the market evolve in line with historical analogues across many commodities. I.e. in the initial phase we saw junior exploration companies, often staffed by ex-large company executives raise and spend high risk capital on exploration. Later came industry Majors into the market, mostly at the corporate level once the gas plays were de-risked and when balance sheet strength was required for large scale development. We believe the South Gobi region, with the colossal Tavan Tolgoi coal field at its centre, is treading a similar commercial path.

Technically there are similarities between Australia's Surat and Bowen Basin coal plays to the Tavan Tolgoi coalfield. Both are Permian coal basins with similar depth and permeability profile, high gas contents and are likely to be developed via horizontal drilling techniques. The Bowen Basin was the first commercially produced CBM in Australia in 1996, and we expect a similar theme to emerge in Mongolia led by CBM in the South Gobi.

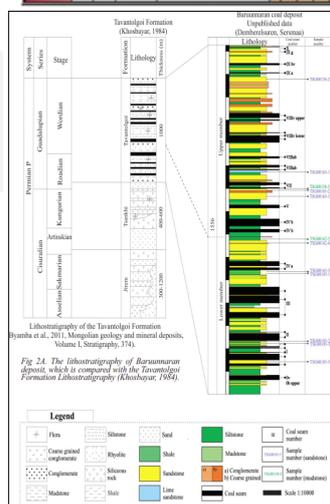
Right: Stratigraphy of the Surat/Bowen Basin

Source: Company



Right: Stratigraphy of the Tavan Tolgoi & Baruun Naran coal deposits

Source: University of Mongolia



In August 2022 JGH announced a sizeable Gross 2C Contingent Resource of 246Bcf, covering only a relatively small portion of the TTCBM Project tenement area. Through the remainder of its 2022 drill program, JGH expanded the prospective potential of the project to ~45km strike which clearly indicates the potential for a much larger resource estimate in due course. Whilst the existing resource already has enough scale to power a large mining operation, i.e circa +100MW, for a number of decades (just one of several monetisation options), an increase in resource size will undoubtedly provide access to more and larger customers.

As with the evolution of the Queensland CSG market when early gas production supplied local power stations, as fields developed further, export channels opened up and gas was sold to international buyers. We see a similar trajectory for Mongolia. Domestic demand initially supplying mining operations such as Xanadu and the expanding transport network (UB Metan). Beyond this a potentially vast and significant export channel available to supply volumes into northern China.

Moreover, tapping into this market could be done on far more favourable terms than those experienced during the Queensland CBM expansion. The economics would appear better for both producer and customer. Relatively short transmission network (200 to 500km) could be established to major markets, eliminating the need for the onerous capital and operating costs involved in liquefaction, transport, and regasification. This vast market in northern China provides plenty of blue-sky for JGH, with the demand being many multiples of available supply.



So What Valuation Matrices Can We Place on the Company in a “What If” Gas Resource Delivery Scenario?

Whilst JGH works through further technical evaluation during 2023, we understand that multiple commercial opportunities are being progressed for gas sales ramping up from as early as 2025. At this stage we can only make a high-level assessment of any potential economics. Prior to an estimation it is worth pausing and considering the following:

Sales Volume

As discussed earlier in this note the regional demand is high and we assume a minimum sales potential of up to 10 PJ per annum to one or more mining focused customers proximate to the TTCBM Project. We see considerable upside to this volume (multiples) and note that this represents only one potential sales channel amongst several.

Gas Pricing

Given the relatively small and lumpy nature of existing LNG gas import and retail in the country, it is difficult to pinpoint an accurate market price. We have no doubt that demand for gas is high and growing in Mongolia. Given the commitment of the Mongolian Government to lower emissions, and the impetus for (all) energy users to utilise **any fuel source cleaner than coal**, we think the sellers will have an element of pricing power in this region. An industry report suggests the gas price in the region is higher than in Australia and has been more in line with globally traded LNG in recent years. We assume a price received of US\$9.50 per mscf in our NAV estimation.

Capital Costs

Technical work through 2023-24 will provide a clearer line of sight on production techniques and costs. If the Queensland CBM field analogue proves correct, the TTCBM Project is likely to be developed using a combination of horizontal and vertical drilling techniques. In this case there would be less wells (reduced surface footprint) but with greater complexity and costs per well, versus a more common high density purely vertical shallow well dispersion. However the TTCBM Project's advantageously thick coal seams lend themselves to horizontal drilling which would likely negate any additional well costs associated with horizontal drilling.

Production Sharing

Assuming production of 150-250 mscfd per well, the ramp up to 10 PJ/a could take four to five years with field development costs peaking at A\$15-20m per year. Under the Production Sharing Contract fiscal model employed in Mongolia, the operator (JGH) is able to gradually recover sunk costs of development out of eventual project cashflows.

With 60% interest in the Joint Venture, and royalties estimated at 7-10%, we estimate that, based on the current Contingent Resource, JGH's share of the JV has potential to approach c.A\$500m.

Risks to Scoping Economics:

- Landed price of gas in Mongolia is an unknown, although we know demand is high;
- Production rate and number of wells required will be determined once the appropriate completion style is determined through the 2023-24 drill program, and then
- Costs of production estimates can be narrowed.

We recognise there is significant upside to JGH in scenarios where:

- Local mining operations scramble for a gas supply option, expediting the ramp up;
- Recoverable gas volumes are increased (through resource expansion) making large scale volume delivery into China a reality;
- Jade's additional projects (BNG, Shivee Gobi and Eastern Gobi) are developed over the same timeline

As with most junior resource exploration and appraisal companies, JGH will likely look to bring in large and experienced industry players as the project nears the development phase and when the results of a Project Feasibility Study are known (est. 2H 2024).



Valuation & Share Price Target

Our risk weighted NAV valuation is early in nature and relies almost entirely on the TTCBM Project delivering successful gas flow rates, reserves and ultimately profitable commercial sales of gas to what is still a rapidly emerging and developing market place.

Before undertaking a risk weighted valuation on JGH and its asset portfolio it is important to recognise that we are undertaking a valuation very early in the Company's life and on low category unrisks Contingent Resources which, are certainly not proven reserves and as such do carry inherent risk. Until proven reserves are established and feasibility work released, it is important to acknowledge that this exercise is highly subjective and is subject to a number of variables and factors to which we have either had to make assumptions or simply do not know as yet.

Nevertheless we believe it useful to undertake a simple NAV exercise to demonstrate the enormous potential of the TTCBM Project and to demonstrate how undervalued we believe JGH to currently be.

NAV Valuation & Price Target

Assuming commissioning to first gas from the TTCBM Project pilot plant to be Q1 2024 is successful, we have undertaken a basic 'sum of the parts' NAV valuation methodology exercise on JGH's asset portfolio, weighting value heavily towards the Company's most advanced flagship project the TTCBM Project. From this exercise we have derived three share price valuations discounted by 10% to take into consideration sovereign risk and any other risk factors possibly not recognised at this moment.

Firstly, we place a 7.4cps valuation on JGH based on valuing the Company on the Red Lake Pilot portion of the TTCBM Project only. Assigning value to the additional (majority) part of the TTCBM Project in addition to the Red Lake pilot production area, we arrive at a share price valuation of 27.1cps. Further adding ultra conservative nominal value to the Company's other three projects, our share price valuation increases to 28.1cps. Taking into consideration our advantageous in-country exposure to operating in Mongolia and its coal industry, we are comfortable to place a fully diluted discounted **Price Target on JGH at 28.1cps**. (Table 4, below).

This basic exercise highlights the enormous leverage potential JGH's asset portfolio has beyond being supported by an initial pilot operation at Red Lake

| Prospect | Stage of Development | Time to Prodn. Year | Unrisks Bof | Equity ***** % | Net Unrisks Bof | CCoS % | Net Risks Bof | Price USD/mscf | NAV USDm | Net Unrisks USDm | Net Risks p/sh USD(undil) | Net Risks p/sh USD (fully dil) | Net Risks p/sh A\$ (undil) | Net Risks p/sh A\$ (fully dil) |
|---|-------------------------|---------------------|--------------|----------------|-----------------|--------|---------------|----------------|----------|------------------|---------------------------|--------------------------------|----------------------------|--------------------------------|
| Tavan Tolgoi Pilot* | 2C Contingent Resources | Q1-2024 | 40.0 | 50% | 20.0 | 50% | 10.0 | 9.5 | 95.0 | 190.0 | 0.068 | 0.060 | 0.098 | 0.086 |
| Tavan Tolgoi Remaining Upside** | 2C Contingent Resources | 2025-2028 | 206.0 | 45% | 92.7 | 30% | 27.8 | 9.0 | 251.0 | 836.6 | 0.180 | 0.158 | 0.259 | 0.227 |
| Baruun Naran*** | Pre Resource | TBD | 1.0 | 66% | 0.7 | 20% | 0.1 | 8.6 | 1.1 | 5.7 | 0.001 | 0.001 | 0.001 | 0.001 |
| Eastern Gobi**** | Pre Resource | TBD | 1.0 | 100% | 1.0 | 10% | 0.1 | 8.1 | 0.8 | 8.1 | 0.001 | 0.001 | 0.001 | 0.001 |
| Shivee Gobi**** | Pre Resource | TBD | 1.0 | 100% | 1.0 | 10% | 0.1 | 8.1 | 0.8 | 8.1 | 0.001 | 0.001 | 0.001 | 0.001 |
| ADJUSTMENTS | | | | | | | | | | | | | | |
| Corp & Admin | | | | | | | | | | -8.00 | | | | -0.005 |
| Debt (A\$) | | | | | | | | | | 0.00 | | | | 0 |
| CASH A\$ (Est end of CY2022) | | | | | | | | | | 3.00 | | | | 0.002 |
| TOTAL | | | | | | | | | | 343.7 | | | | |
| ISSUED CAPITAL | | | | | | | | | | | | | | |
| Shares (m) | | | 1,397 | | | | | | | | | | | |
| Options (m) | | | 170.5 | | | | | | | | | | | |
| Performance Rights (m) | | | 25.0 | | | | | | | | | | | |
| TOT Fully Diluted | | | 1,593 | | | | | | | | | | | |
| | | | | | | | | | | | Undiscounted | 10% Discount | | |
| TOTAL (Tavan Tolgoi Pilot Only) SA per share (fully diluted) | | | | | | | | | | | 0.083 | 0.074 | | |
| TOTAL (Tavan Tolgoi Pilot & Tavan Tolgoi Remaining Upside Only) SA per share (fully diluted) | | | | | | | | | | | 0.310 | 0.279 | | |
| TOTAL (All Projects) SA per share (fully diluted) | | | | | | | | | | | 0.312 | 0.281 | | |
| ISSA Exch Rate | | | | | | | | | | | | | | |
| 1.44 | | | | | | | | | | | | | | |
| 0.69 | | | | | | | | | | | | | | |

Notes:

* TT Pilot production area assumed to have 40Bof gas recoverable. Assigned a higher than normal CCoS at this point due to our Mongolian coalfield experience confidence in these coals successfully producing

**Despite resources only at 2C Contingent category at the moment we weigh relatively high confidence of 30% CCoS again due to our Mongolian field experience

*** For Baruun Naran we have conservatively used a 20% CCoS due to uncertainty surrounding the approvals process and on timing of the field's development but have taken into consideration encouraging early exploration success

****We have assigned a nominal Bof of gas Pre Resource figure and a low CCoS at this point due to projects at such early stage

***** Equity takes into consideration equity at the project level discounted back to take into consideration expected government production profit sharing

Gas price used in table is reflective of a long term life of asset gas price schedule building in pricing uncertainty in the long term

CCoS = Commercial Chance of Success

Above: Table 4: NAV per Project & Share Price Target Estimates

Source: Our Estimates



Board & Management

Dennis Morton – Non Executive Chairman

Mr Morton is a geologist with over 40 years' experience in the oil and gas industry, including substantial experience in coal seam gas projects. He is currently the Managing Director of ASX listed company Gas2Grid Limited, and previously held positions as founder, CEO and Managing Director of ASX listed Eastern Star Gas Limited, as well as with Eastern Energy Australia Pty Ltd, Hartogen Group of Companies and Esso / Exxon.

Mr Morton holds a Bachelor of Arts-Geology with first class honours from Macquarie University, Sydney.

Chris Jamieson – Managing Director & CEO

Mr Jamieson has a background in capital markets, mergers & acquisitions, and investor relations, with over 25 years of extensive oil and gas/resources industry experience. Mr Jamieson has held a number of senior executive roles including Group Executive – External Relations at Beach Energy Ltd. Prior to Beach, Chris worked in corporate finance (transaction support) at Ernst & Young in Adelaide, London, and San Francisco, as well as in the mergers and acquisitions group at Normandy Mining Ltd, Australia's largest gold miner at the time. More recently he co-founded Jamieson Piper, a capital markets and investor relations firm that serviced clients across a range of industries including oil and gas, mining and manufacturing.

Mr Jamieson holds a Bachelor of Commerce from the University of Adelaide, along with several post-graduate qualifications including a CPA, graduate diploma of Applied Finance and Investment (FINSIA) and diploma of Investor Relations (AIRA).

Joe Burke – Executive Director

Mr Burke is an experienced mining executive. He has spent over 30 years working and living in Asia and has been involved in Mongolian mining projects since 2009. In previous roles Mr Burke was a Director and founding partner of the mining venture capital group Starboard Global and the CEO of ASX listed Voyager Resources Limited (ASX: VOR) which had projects based in Mongolia. He has also undertaken advisory roles with an Asian focus and with other ASX listed entities including American Pacific Borates Ltd (ASX:ABR), and Black Rock Mining Limited (ASX:BKT).

Mr Burke holds an MBA from the Australian Graduate School of Management (AGSM).

Peter Lansom – Non Executive Director

Mr Lansom has over 30 years' experience in conventional and unconventional exploration, appraisal and development in the oil and gas industry, including subsurface engineering, asset valuation, field development planning and commercial/corporate finance. Mr Lansom is currently a Non-Executive Director for Metgasco Ltd and Bengal Energy Ltd. In his most recent executive role, Mr Lansom was Managing Director of Galilee Energy Limited, an Australian coal seam gas explorer and appraiser, where he oversaw the appraisal of the Glenaras coal seam gas field in the Galilee Basin. Prior to Galilee, Mr Lansom was at Eastern Star Gas Limited, where he had overall engineering responsibility for the exploration and pilot development of the company's coal seam gas assets in NSW, growing the 2P Reserves to approximately 1520 PJ which underpinned the company's eventual market capitalisation of \$1 billion.

Mr Lansom holds a Bachelor of Petroleum Engineering (Honours) degree from the University of NSW.

Daniel Eddington – Non Executive Director

Mr Eddington has over 20 years' experience in the financial markets with experience across multiple sectors including the resource, energy and industrial sectors. He specialises in equity capital markets and has been responsible for IPO's, placements, reverse takeovers, underwritings, corporate negotiations and corporate advisory for companies predominantly in the resource sector.

Mr Eddington has a Bachelor of Commerce Degree from The University of South Australia and a Graduate Diploma in Applied Finance & Investment from the Securities Institute of Australia

Mr Eddington is also a Director of Sparc Technologies Limited (ASX:SPN) and Osmond Resources Limited (ASX:OSM)

Mark Pitkin – GM, Technical

Mr Pitkin is a reservoir engineer, with almost 30 years of experience in the oil and gas industry, who most recently worked as the General Manager of Development for Beach Energy Ltd's South Australian and Western Australian assets.

Mark has extensive CBM experience and was Origin's subsurface development engineer for the Spring Gully CBM Field. This project went from a five-well pilot to gas production of 10 PJ per annum, which formed a key part of the full field development plan for the more than 1 Tcf field. Mark also stewarded Beach Energy Ltd's Tipton West CBM technical position during the successful sale process to Arrow Energy.



Risks Associated with Investing in Jade Gas Holdings Limited

Potential investors need to be aware that investment in Jade Gas Holdings Limited, like all investments in junior resource companies, is of a highly speculative nature. Normal share market risk conditions apply including commodity prices, currency fluctuations, sentiment, supply and demand and general economic outlook. Normal exploration, development and production risks also apply as well as operating environmental, sovereign and native title risks.

About The Author of this Paper

The author of this paper Ian Spence holds a BSc Joint Honours degree in Geology & Petroleum Geology (University of Aberdeen), an MSc in Mineral Exploration & Mining Geology (University of Leicester) & an MBA (University of Western Australia). During his 30 year technical and capital markets career he has periodically been involved with capital raisings and high level evaluations of CBM and coal seam related gas projects both in Australia and internationally.

Relevant to this research paper on Jade Gas Holdings Limited, between 2009 and 2012 Ian spent 3 years in the position of Managing Director to a Singapore domiciled resources company tasked with providing management services and adding substantial value (+USD300m) to a large US hedge funds portfolio of Mongolian coal projects. The projects ranged from mature operating open cut mines supplying coal daily to several Mongolian power stations, brownfields resource developments and greenfields exploration spanning coal districts from northern Mongolia into the Gobi region.

His role involved engaging with world class coal consultants in country, some of which worked on the modern exploration, detailed interpretation and evaluation of the complex multiple coal seams at the Tavan Tolgoi coal deposit. Naturally that exposure in addition to having successfully operated (heading up a 32 person team) in Mongolia places him in an advantageous position to appreciate the high quality of Jade's CBM tenement holdings and the enormous opportunity the Company has presented to it to deliver gas into a local market desperately seeking new and alternative energy supply.

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