Elixir Energy Limited (ASX: EXR)

Large gas potential on China's doorstep

Overview

Elixir Energy (ASX: EXR) is an oil and gas company focused on exploring for coal bed methane (CBM, also known as coal seam gas CSG) in the South Gobi region of Mongolia, adjacent to the Chinese border. The area is well located to supply future Mongolian and Chinese gas and power demand. Elixir's near-term plans include drilling two or three coreholes to begin converting the existing 7.6 tcf mid-case exploration target to contingent resources. Catalysts for value creation include drilling results (late 2019), contingent resource assessment (early 2020) and gas production pilot (late 2020), followed by potential farm-out to a larger partner. We value Elixir at $0.22 /sh, with a range from $0.10-0.43 based on a risked exploration assessment.

Key points

Investment thesis: Large gas resource close to China: Elixir holds 100% of the Nomgon IX CBM production sharing contract (PSC), covering ~30,000 km^2 (~7 million acres) just north of the border with China. The potential gas resource is very large, with a mid-case of 7.6 Tcf recoverable, equivalent to over 120 Mt of LNG. Future development, should exploration and appraisal prove successful, is likely to involve pipeline connection to China and/or power generation into the Mongolian grid.

Low cost appraisal: CBM continues to offer relatively low cost exploration and appraisal for large gas volumes, due to the shallow, laterally extensive nature of coal resources. Hence juniors can fund the initial discovery and derisking of resource volumes that are material to international majors and national oil companies.

Strong in-country relationships: Elixir has developed strong relationships with government bodies, technical experts and the local service sector, through the involvement of its predecessor company, Golden Horde, in Mongolia since 2011.

Accelerated entry: The commencement of field exploration in 2H 2019 represents the culmination of eight years of preparatory work, offering the attraction of accelerated entry into appraisal, development and production for larger partners if exploration results are positive.

Technical, commercial and regulatory risks: Elixir is an early stage, single asset company. Risks include the quantity and quality of the CBM resource, economics and funding of appraisal and development options, navigating the Mongolian petroleum regulatory system and approvals process and negotiating gas commercialization pathways.

Value catalysts in advance of sales revenue: Revenue from gas sales is unlikely to be achieved for some years, given exploration, appraisal and capital project development lead-times. However, value uplift is likely in advance of gas sales with continued project derisking, including drilling results in late 2019 and contingent resource assessment in early 2020.

Need for further funding: Elixir is fully funded for the current exploration program but will require additional funding in 2020 for further seismic and a gas production pilot to demonstrate commercial gas flowrates.

SHARE PRICE PERFORMANCE

Closing price as of 20th Sep 2019

CAPITALIZATION	
Last price	$0.052
52-week range	$0.026-0.065
Capitalization	$25.4m
Cash: 30th Jun	$4.4m
Debt: 30th Jun	nil
EV	$21.0m
Shares (")	488.2m
Options/rights	118.0m
Conv Notes	-
Balance date	June
RESERVES AND PRODUCTION	
1P (30 Jun 19)	0.00 MMboe
2P "	0.00 MMboe
3P "	0.00 MMboe
2C "	0.00 MMboe
FY17a	0.00 MMboe
FY18e	0.00 MMboe
FY19e	0.00 MMboe
SHAREHOLDERS (%)	
Board/mgt	
Insto/HNW	
Retail	
Total	100.0
LEADERSHIP	
Chairman	Richard Cottee
MD/CEO	Neil Young

Disclosure: This is a commissioned research report and K1 Capital will receive a fee for preparing this report.

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Disclosure:

This report was commissioned by Elixir Energy Limited (Elixir) and K1 Capital Pty Limited (K1 Capital) will receive a fee for preparing this report. The purpose of the report is to provide an assessment of the value of Elixir Energy Limited. The user of this report is Elixir and persons designated by them. K1 Capital has prepared this report based on interviews with management and research using publicly available information. K1 Capital has not undertaken a site visit to Elixir's projects. To the best of K1 Capital's knowledge, full, accurate and true disclosure of all material information was provided by Elixir. Given the potential for a perceived conflict of interest it is K1 Capital's policy not to include a share price target or investment recommendation for commissioned research. K1 Capital may seek to do business with companies covered in its reports. Consequently investors should be aware that the firm may have a conflict of interest that could affect the objectivity of its research. Please see the final page of this report for further information on disclosures and disclaimers.

1. Project review

Elixir's key project is the Nomgon IX coal bed methane Production Sharing Contract in Mongolia. Two other projects, the Moselle exploration permits in France and the Petra Project in Colorado, USA are non-core and are expected to be divested.

1.1 Nomgon IX PSC, Mongolia

Good location and fiscal terms: The Nomgon IX Coal Bed Methane Production Sharing Contract covers ~7 million acres (30,000 km^2) close to the Mongolia/China border. Both Mongolia and China require additional gas supplies, discussed later in this report. The PSC was signed in September 2018 and provides a 10-year exploration term, extendable to 15 years, and a 30-year production term. Fiscal terms include a royalty of 5-10% of net wellhead value and government share of profits of up to 40% but no income taxes and no government back-in rights.

Geology similar to Australia's Bowen Basin: The South Gobi Basin hosts Permian coals, similar in many respects to Australia's Bowen Basin coals on which the Queensland coal seam gas (a.k.a CBM) industry is based. The coals are thick and have high gas content based on information from extensive regional coal exploration. CBM parameters, such as permeability, gas saturation and desorption characteristics, are less well understood. Key coal parameters are summarized below.

Figure 1 Comparison of South Gobi Basin and Bowen Basin Coal

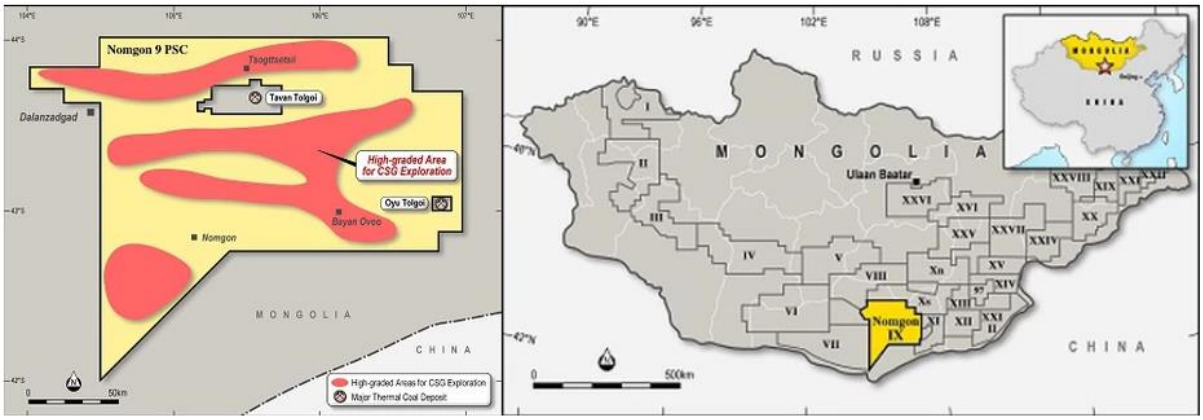
PROPERTIES	BOWEN BASIN (QUEENSLAND)	SOUTH GOBI (MONGOLIA)		COMMENTS
Seam thickness	Maximum single seam thickness 30m	>55m found in multiple locations	✓	World class seam thickness and hence very high GIP per acre
Gas content	7-14 m^3/tonne in most productive areas	Up to 15m^3/tonne at Tavan Tolgoi	✓	High gas content
Permeability	Varies from 2-600MD	Unknown, but coal samples show good cleat formation with no calcite	?	Requires corehole testing
Presence of coal at depth	Considered optimally productive down to 900-1,000m, with potential deeper	Vast acreage position and evidence of substantial area with thick coal seams < 1,000m	✓	Compares favourably to world class CBM basins
Coal quality – ash content	Varies significantly but is ~30% in the most productive fields	~24% ash content	✓	Within ideal range
Coal quality – rank	Sub-bituminous to bituminous	Sub-bituminous to bituminous	✓	Analysis shows VR consistent with coals that have undergone gasification

Source: Elixir Energy Limited, investor presentation, 4th September 2019, p16.

Approval granted for exploration: Elixir and its predecessor company Golden Horde have been active in Mongolia since 2011. Recent milestones include execution of the PSC, approval of the exploration plan, awarding of the exploration licence and approval of the detailed environmental impact agreement. Field exploration work commenced in August 2018, involving the acquisition, processing and interpretation of 131 km of 2D seismic, which will be followed by drilling of two or three coreholes, to depths of ~600+ m. The first well (Ugtaal-1) is expected to spud in late September/early October.

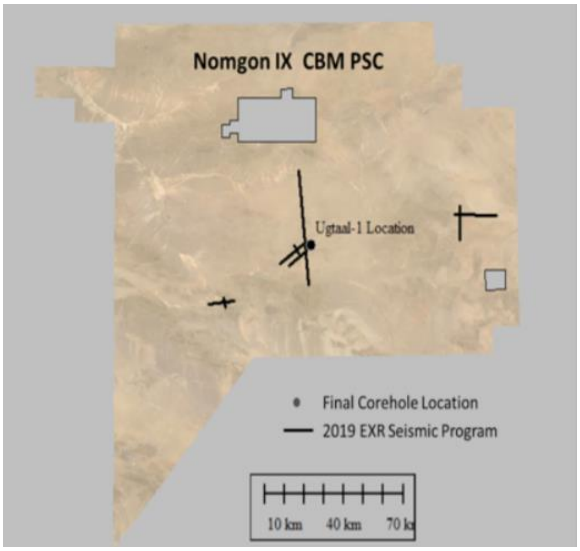
Exploration aimed at contingent resource confirmation: Exploration work is aimed at confirming the presence, thickness, permeability and gas content of the coals and the composition of the gas to move prospective resources to the contingent resource category. An independent contingent resource assessment is expected in early 2020. The corehole program incorporates coring of coal seams, two Injection Fall Off Tests (IFOT) of prospective coal seams, wireline logging and desorption analysis of coal cores. The coreholes will be plugged and abandoned after testing. The location of the PSC, seismic survey within the permit and planned first well are shown below.

Figure 2: Nomgon IX CBM PSC location map



Source: Elixir Energy Limited, website, accessed 29h August 2019

Figure 3 Location of 2D seismic within PSC



Source: Elixir Energy Limited, investor presentation, 4th September 2019, p10.

Large prospective resource: ERC Equipoise Pte Ltd estimated a mid-case risked recoverable prospective resource of 7.6 tcf in November 2018, indicating the large-scale potential of the area. The resource estimate was based on gravity and magnetic data, field mapping information and coal core hole data (net coal thickness, coal density, gas content, ash and moisture content) from within the Tavan Tolgoi area inside, but excluded from, the PSC. Gas recovery factors were based on US CBM analogues. The resource risk should reduce following the 2H 2019 exploration program. We expect the initial contingent resource will be significantly smaller than the pre-drill prospective resource estimate, given it is likely to be based on well spacings around the core holes, but expect it to grow over time with further work.

Table 1 Nomgon IX independent prospective resource assessment

Nomgon IX CBM PSC: Mongolia (EXR:100%) *Probablistic Calculations*	Unit	Low (1U)	Best (2U)	High (3U)
Unrisked Recoverable Prospective Resources	TCF	13.6	40.1	117.2
Geological Chance of Discovery			19%	
Risked Recoverable Prospective Reosurces*	TCF	2.6	7.6	22.2

Source: Elixir Energy Limited, investor presentation, 4th September 2019, p15.
Commercial chance of success not included above, but estimated by ERC Equipoise Pte Ltd at 50%, per Elixir Energy Limited, ASX release, 19th November 2018. Estimate to 2018 SPE PRMS standard.
Mid-case risked recoverable prospective resource density = 0.25 bcf/km2.

Next steps: Further exploration and appraisal will be dependent on funding, not resource size. We expect the current corehole drilling will be followed by further seismic and drilling of relatively inexpensive chip holes to confirm coal thickness in other parts of the permit and possibly further core holes to extend the contingent resource size. This may be followed by a small pilot project of three to five wells to dewater an area of the permit and produce gas to surface to demonstrate commercial flowrates. We think it likely that Elixir will then farm-down or sell out to a larger partner to commence staged development of the permit. The scale of the resource is such that development is likely to attract a major international company or national oil company, possibly from China given the likely destination for the gas.

1.2 Other interests

Moselle Permit, France: Elixir has a 100% interest in the Moselle exploration permit in eastern France which is prospective for conventional oil and gas. Exploration progress has been halted due to delays relating to legislation from the French parliament prohibiting the awarding of new exploration licences and banning oil and gas activities from 2040. The permit is now non-core and will be divested when possible. We understand there are no material work commitments or exit liabilities.

Petra Project, Colorado, USA: Elixir has a 25% working interest in the Petra conventional oil project, comprising ~1,539 net acres in Colorado. Exploration has been unsuccessful. Exit will occur as acreage is relinquished. We understand that there are no material work commitments or exit liabilities.

Alaska: In April 2019 Elixir completed the disposal of a wholly owned subsidiary which held a 100% working interest in 149,590 acres of leases in Alaska to Entek Energy Limited (ASX: ETE) for 185 million shares in Entek and a cash payment of US$846k (~$1.2 million). The 185 million ETE shares were distributed to Elixir shareholders on a pro-rata basis. Elixir now holds no interests in either in Alaska or in ETE.

2. Gas markets

The Nomgon IX PSC is well positioned to supply gas demand in both Mongolia and China, with the permit located ~545 km from the Mongolian capital, Ulaanbaatar, and ~410 km from the major East-West Pipeline in China. By way of context, these are similar distances to the distance between the Roma gas hub in Queensland which supplies the east coast Australia LNG projects in Gladstone.

2.1 Mongolia

Background: Mongolia has a small population of 3 million people, of which 1.2 million live in the capital. There is no indigenous gas production and most of Mongolia's energy demand is met by coal fired power generation and electricity and oil product imports from Russia. There is a relatively small hydrocarbon industry, based on modest indigenous oil production (~7 mmbbl/yr or ~20 kbopd), and the country has experience with large scale mineral resource projects, including coking and thermal coal. Mongolia is also well endowed with potential wind, solar and hydro renewable resources, although existing capacity is limited.

Air quality concerns: Ulaanbaatar has some of the poorest air quality in the world during the winter months, due to coal generated smog [1]. Government policy aims to increase the share of renewable energy to reduce the environmental issues associated traditional power generation [2]. Gas fired generation would complement the intermittency of wind and solar generation.

Power generation: Electricity demand is expected to grow at a moderate rate of 2.0%pa, from 7.7 M kWh/yr in 2018 to 9.8 M kWh/yr by 2030 [2]. However, Mongolia proposes to double current installed generation capacity of 1122 MW over the next ten years, predominantly via coal fired generation, despite air quality concerns, with surplus capacity to be exported [3]. It is not clear if this proposal will move to definitive and funded projects. However, regional infrastructure projects may offer scope for gas fired power generation or gas transmission, should sufficient gas be found in-country.

Asian Super Grid project and gas pipelines: The ASG project envisages connecting China, South Korea, Mongolia, Russia, and Japan to deliver renewable power. This would require the construction of large-scale high voltage DC transmission lines through the Gobi region, providing infrastructure for connection of potential gas fired generation within the Nomgon PSC. Although the ASG project is at an early conceptual stage, Russia, Mongolia, China, Japan and South Korea have already signed hydrocarbon production and supply agreements to accelerate development of regional energy supply infrastructure, although it is not clear whether these will lead to firm arrangements [4]. Mongolia has proposed that Russia build a natural gas pipeline to China via Mongolia, rather than via a planned 2,800 km western route through the Altai Mountains and China's Xinjiang region [4]. However, China does not yet appear to support a transit country route.

2.2 China

China's energy demand: Various forecasters expected China's natural gas demand to increase significantly, as shown in Figure 4 below. BP expects China's natural gas demand to almost double to 14% of total energy demand (cagr of 4.4% from 2017 to 2040), equivalent to 641 bcm/yr in 2040, even with renewables' share rising from 3% to 18% in the same period [5]. Domestic gas demand already significantly exceeds domestic supply and this shortfall is expected to increase, from 4,663 PJ in 2018 (~4.6 tcf) to 10,600 PJ in 2040 (~10.6 tcf). The shortfall is currently met by a combination of pipeline imports from Central Asia and Myanmar and LNG imports along China's coast, with pipeline imports from Russia via the Power of Siberia pipeline expected to commence later this year. Future shortfalls

are expected to be met predominately by pipeline supply from Russia and LNG. The location of the Nomgon IX PSC should provide a cost advantage relative to each of these alternatives.

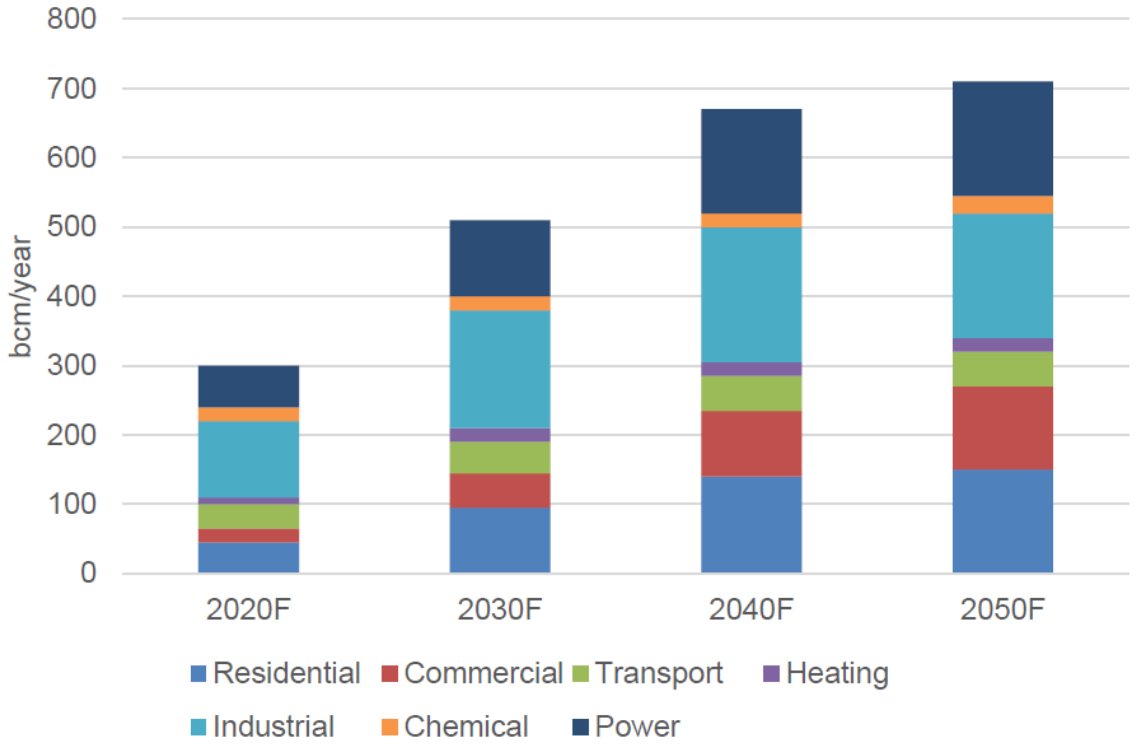
Figure 4 Selected Chinese gas demand forecasts

bcm/year		2017	2020	2030	2035	2040	2045	2050
NDRC	Actual	237		450				
NEA					650			750
State Council	Target		360	666			600	700
PetroChina	Initial			455				
PetroChina	Revised			620				
CNPC				520	620			695
CNOOC			340					
CERS	Initial		280					
CERS	Revised		290					
IEA	WEO 2017 New Policies			482	554	610		
US EIA	IEO 2017		249	412	492	582	689	792
Brokers			366	600				

Source: NDRC, NGD 5 January 2017, 17 August 2017, EIG, CNPC ETRI, broker research, IEA WEO 2017 Table 14.5 p590, EIA 2017, WGI 26 September 2018

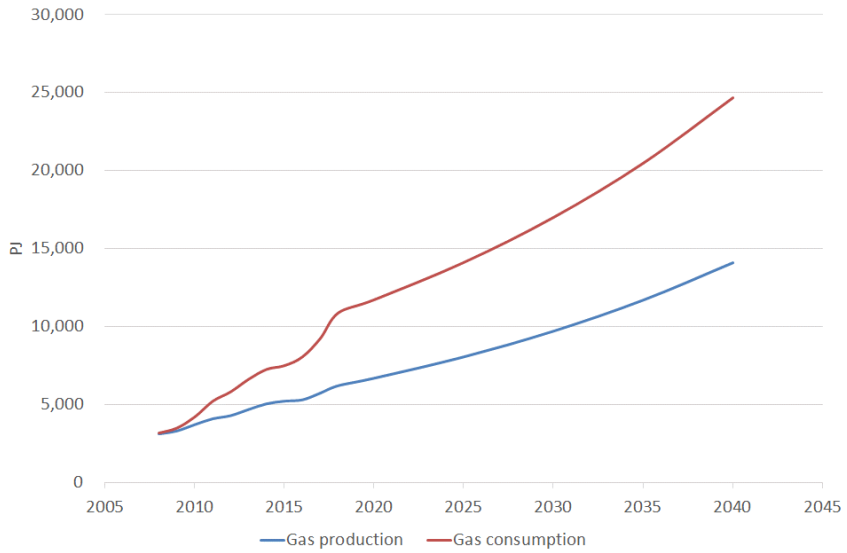
Source: Oxford Institute for Energy Studies, [8], p 65

Figure 5 Gas demand forecasts by sector, 2020 to 2050



Source: Oxford Institute for Energy Studies, [6], p 63. Chart attributed to CNPC.
Total demand in 2040 matches closely BP's forecast for total gas demand in 2040 Figure 6.

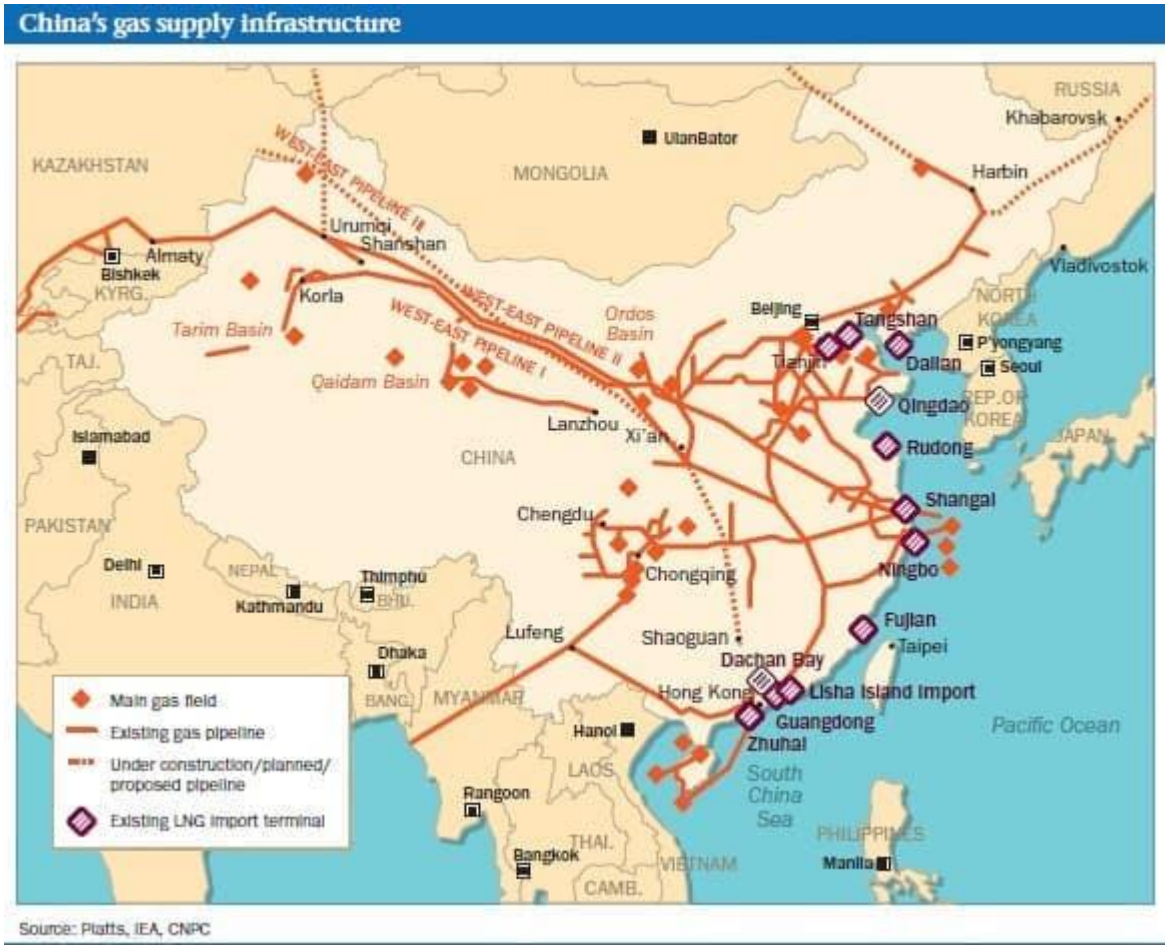
Figure 6 China's natural gas demand and domestic supply



In the early 2000s gas was consumed largely as an industrial feedstock, with little used in the power generation and residential sectors. The commissioning of the West–East pipeline in 2005 linked the gas fields of western China to demand on the east coast, leading to increases in consumption. LNG imports commenced in 2006, followed by pipeline gas from Central Asia in 2010. These factors, combined with expansion of domestic trunk pipelines, expanded the geographical extent of the natural gas market. [8] p20

Source: K1 Capital analysis of BP's "Statistical Review of World Energy 2019" and "energy Outlook – 2019" for China. Actual data from 2008 to 2018, projections from 2020 to 2040 at constant cagr. Gas heating value of 1.03 MMBtu/kscf

Figure 7 China's gas supply infrastructure



Source: Vanand Meliksetian, "China to Become Most Influential Player in Natural Gas Markets", 27th June 2018 [7]

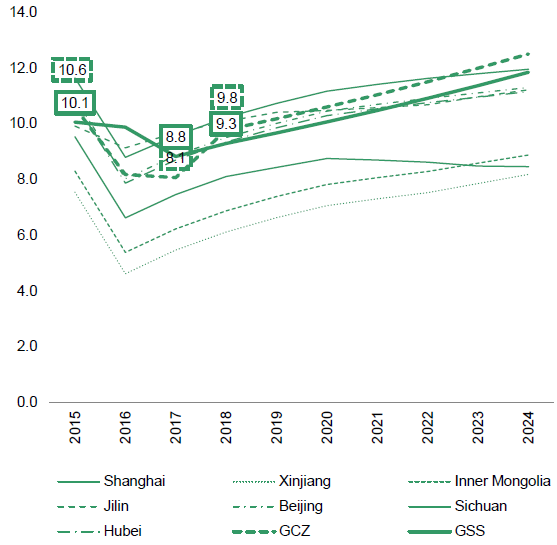
Environmental issues driving gas demand: The rapid rise in China's gas demand has been driven by air quality concerns in the major cities. Legislation changes and state planning (e.g. Blue Sky Action Plan, 13th Five Year Plan, etc.) have resulted in coal to gas switching and an increase in renewable energy. The Chinese government's target of gas supplying 15% of total energy consumption by 2030 is still well below the share of gas in developed economies such as the EU and USA, of ~24% and 28% respectively. Whilst the EU and US gas markets matured at a time when renewable energy did not provide an economic alternative, current air quality levels remain relatively low by international standards and it is likely that China's targets will be progressively tightened, providing ongoing support for gas demand [8]. The Oxford Institute for Energy Studies notes that economic growth and government policy are currently more important drivers of gas demand in China than price [6] p59.

Regional differences: Most indigenous gas is produced in western and central China, while most gas consumption takes place in the eastern and southern parts of the country. Only six of the thirty provinces and municipalities have a gas surplus; the rest need to source supplies either from other provinces through the domestic long-distance pipeline network or via imports of gas through pipelines from Central Asia and Myanmar or LNG terminals on China's south and east coasts. [6]. In addition, gas prices vary between the provinces, in part due to delivery logistics and capacity to pay.

China gas pricing: We expect gas prices in China should be supportive of CBM development in Mongolia, should productive coals be discovered. Conventional (as opposed to CBM) gas prices have historically been regulated by the National Development and Reform Commission (NDRC), which sets a base price for different onshore fields and pipelines based on types of end users supplied. In recent years, the NDRC has undertaken reforms to raise the price of natural gas to encourage greater production [8] [9]. Unconventional gas prices (including CBM) are unregulated (except when combined with conventional domestic or imported pipeline gas after pipeline transport) and are driven by demand and supply trends in the respective regional markets with reference to prevailing natural gas prices. Each province sets prices for natural gas within its territory based on the NDRC guidance. Retail CNG pricing follows the city-gate pricing levels set by the Central Government. [9]

G3 Exploration, an AIM-listed China CBM exploration and production company, reports that average gas prices received by gas producers have increased in recent years. G3E's received prices are set under long-term GSAs and include subsidies issued by the MOFC and the Shanxi provincial government, at around $9.30-$9.78/kscf in 2018, depending upon the PSC [9].

Figure 8 China city gate and PSC gas prices



G3 Exploration contract prices, 2018

	RMB/m3			$/MCF		
Area	Contract Price	Subsidy	Received Price	Contract Price	Subsidy	Received Price
GSS	1.70	0.40	2.10	7.52	1.77	9.30
GCZ	1.81	0.40	2.21	8.01	1.77	9.78

Inclusive of VAT

Source: G3 Exploration Limited, Investor Presentation, February 2019, p 25 [9]

3. Valuation

3.1 Methodology

Valuing exploration properties is difficult due to uncertainty regarding the existence, size and quality of the resources, number and size of prospects that will be drilled in a reasonable time frame and the likelihood, costs and timeframe of commercial development. The four main valuation methods are as follows.

Table 2 Exploration valuation methods

Method	Description
Risked exploration	EV per resource metric adjusted for geological probability of success and commercial probability of development, less risk capital. The resource metric is derived from DCF models of analogous projects or trading or transaction multiples. Normally we consider targets that are expected to be drilled within the next one to three years, and place little value on prospects outside this period.
Comparable resource metrics	EV per resource or area derived from trading or transaction metrics, for comparable project risks or development maturity, premium or discount to market and strategic or other considerations.
Farm-in	The gross value of the permit is the amount spent by the party farming in divided by the interest earned. The farm-in may have several stages and include re-imbursement of past costs and milestone payments, which may need to be adjusted for time value and probability of occurrence.
Work program	Assumes the value of the permit is what the permit holders have spent and will spend on the work program.

N.B. ASIC[1]and ASX[2] guidelines effectively preclude using discounted cash flow analysis of potential production projects for valuing early stage exploration, given concerns about the reasonableness of information for projections regarding future production.

Given the absence of relevant farm-in transactions we have valued Elixir's interest in the Nomgon IX PSC using a risked exploration approach, with underlying resource metrics drawn from market trading multiples for peer companies.

3.2 Peer comparison

Peer comparison: Where sufficient data exist we compare companies to their peers using enterprise value to reserve and resource metrics. We compare reserves and resources based on an energy price equivalent basis, rather than simply an energy thermal equivalent basis, to better account for the value differences between oil and gas resources. Our price equivalence factors are listed in Table 4 below.

Peer group: We have identified six ASX-listed companies with CBM interests in Australia and a further five companies with international CBM interests as potential peers. We have identified two internationally listed companies, one with CBM interests in China (AIM-listed G3 Exploration) and one with conventional oil & gas interests in Mongolia (AIM-listed Petro Matad). The companies and market metrics are summarized in Tables 5 and 6.

[1] ASIC RG79, RG 170 and RG264.63

[2] ASX Guidance Note 31, Guidance Note 32 and Information Sheet 214

Table 3 Reserve & resource price equivalence factors

Commodity	units	Price 13-Sep-19	Price $US/boe	Price factor	Source
USD/AUD forex	$US/$A	0.6802	-	-	Reserve Bank of Australia
Brent	$US/bbl	64.79	60.37	1.00	Bloomberg
WTI	$US/bbl	58.60	55.15	0.91	"
HH	$US/mmBtu	2.51	14.96	0.25	"
EC Australia	$A/GJ	6.88	28.63	0.47	AEMO Wallumbilla benchmark 18 Sep
WC Australia	$A/GJ	2.81	11.83	0.20	gasTrading spot price Aug '19
Europe	$US/mmBtu	4.04	22.85	0.38	ICE UK NBP 19 Sep
LNG	$US/mmBtu	8.85	51.31	0.85	85% of Brent (14.7% slope)
China	$US/mmBtu	9.00	52.20	0.86	K1 Capital
LPG	$US/t	355	31.14	0.52	Saudi Contract Price - Sep '19

Source: K1 Capital analysis

Table 4 Peer group

Company as of 20-Sep-19	Code	Mkt Cap M$A	EV M$A	Description
Elixir Petroleum	EXR	25	21	Nomgon IX CBM PSC, South Gobi Basin, Mongolia
Australian CBM companies (6)				
Blue Energy	BLU	57	52	Conv. & unconv oil & gas exploration in Qld/NT (Bowen, Surat, Cooper, Maryborough, Wiso, McArthur Basins). ATP 814P CSG block adjacent to Arrow's Moranbah field.
Comet Ridge	COI	193	180	CSG expln/appraisal in the Bowen Basin (Mahalo JV with Santos & APLNG), Galilee Basin (own and JV with Vintage), and Gunnedah Basin (JV with Santos).
Carbon Minerals	CRM	2	-2	NSW CSG exploration, Gunnedah Basin JV with Santos
Galilee Energy	GLL	242	230	CSG expln/appraisal in the Galilee Basin (Glenaras lateral pilot, Queensland) and CSG licence application in the Magallanes Basin in Chile. Withdrawing from US onshore.
State Gas	GAS	113	107	Majority interest in the Reid's Dome Gas Project (PL 231), central eastern Queensland.
Senex Energy	SXY	574	561	Oil & gas exploration and production in the Cooper Basin (JVs with Cooper and Beach) and CSG in the Surat Basin of Queensland (WSGP and Atlas domgas project).
International CBM/Mongolian companies (6)				
Kinetiko Energy	KKO	8	8	CBM exploration in South Africa. 49% interest in the Amersfoort Project. Suspended since late 2017, pending resolution of funding issues with JV partner Badimo Gas.
NuEnergy Gas	NGY	27	28	Indonesian CBM; six PSCs in South Sumatra, Central Sumatra and East Kalimantan, including 45% Tanjung Enim PSC and 100% Bontang Bengalon PSC (East Kalimantan)
Strata-X	SXA	4	4	Serowie CSG project in Botswana, plus shallow oil, Illinois, USA
Triple Energy	TNP	1	1	MOU to acquire an 80% of Songyuan Petroleum Development Co. Ltd, Jilin Province, PRC; Aolong JV in Heilongjiang Province, PRC for coal mine methane drainage
Tlou Energy	TOU	43	38	CBM exploration in Botswana. 100% interest in the Lesedi and Mamba CBM projects. Low initial gas flowrates; successful tenderer for gas and power supply to government.
G3 Exploration	G3E	104	351	CBM exploration and production in China. Seven PSCs, totalling ~7,500 km2, with CNOOC and PetroChina. Two producing PSCs, two in development.
Petro Matad	MATD	61	37	Conventional oil & gas exp in Mongolia: Matad Block XX 10,340 km2 near eastern border with China; Bogd Block IV and Ongi Block V 50,000 km2 in west central

Source: K1 Capital, company data. EV estimated from most recent cash and debt values (typically 30th June 2019 or 31st December 2018).

3.2.1 Market metrics

We consider prospective resources to be a difficult correlating metric, given the range of reporting practices adopted, and prefer to focus on 2P reserves and 2C contingent resources where possible. However, given the absence of 2P and 2C data for Elixir we instead note the range of Enterprise Values ascribed by the market to CBM exploration companies. These range from zero for ASX-listed companies with little near term activity (Carbon Minerals – NSW bans on CSG exploration) to $50-250m for companies with contingent resources or recent discoveries with an underlying development thematic such as east coast gas (Blue Energy, Comet Ridge, Galilee Energy) and up to $570m for Senex Energy with existing production and development projects.

Our analysis of Australian CBM data from Santos and APLNG indicates that ~80% of CBM 2C resources are converted to 2P reserves over time and hence our primary comparative assessment is based on an EV/(2P+0.8*2C) multiple.

EV/(2P+0.8*2C) multiples for Australian projects range from $0.05/GJe for Blue Energy (undeveloped, currently stranded) to $0.10-0.28/GJe for Galilee Energy and Comet Ridge respectively (Galilee early stage, low flowrates, geographically remote; Comet approaching FID, strong flowrates and well located Mahalo project). The multiple for Senex of $0.57/GJe reflects in large part Senex's existing producing conventional oil and gas assets and post-FID construction of CBM projects.

Multiples for international projects range from $0.09-0.13/GJe for Tlou's and Strata-X's Botswana projects (early stage flow rates, currently sub-economic, but strong local gas demand and pricing) to ~$0.20/GJe for NuEnergy Gas and G3 Exploration (partly developed CBM projects in Indonesia and China respectively). Note that these are east coast Australia price equivalent GJe multiples and differ from a straight energy equivalent GJ basis. On an energy equivalent basis EV multiples for NuEnergy Gas and G3 Exploration are ~$0.37/GJ, reflecting the higher gas prices in these two countries.

Table 5 Reserve and resource metrics

Company	Code	Last Price 20-Sep-19	Total Shares (million)	Mkt Cap M$A	EV M$A	1P price equivalent basis PJe'	2P price equivalent basis PJe'	2C price equivalent basis PJe'	EV/1P $A/GJe	EV/2P $A/GJe	EV/ (2P+0.8*2C) $A/GJe
Elixir Petroleum	EXR	0.051	488	25	21	-	-	-	-	-	-
Australian CBM companies (6)				**1,182**	**1,129**	**153.1**	**981.1**	**5,825.2**	**7.37**	**1.15**	**0.20**
Blue Energy	BLU	0.043	1,327	57	52	-	71.0	1,166.0	-	0.73	0.05
Comet Ridge	COI	0.265	728	193	180	18.0	172.0	582.0	9.99	1.05	0.28
Carbon Minerals	CRM	0.130	19	2	-2	-	-	183.0	-	-	-0.01
Galilee Energy	GLL	1.050	230	242	230	-	-	3,011.5	-	-	0.10
State Gas	GAS	0.790	143	113	107	-	-	536.0	-	-	0.25
Senex Energy	SXY	0.395	1,453	574	561	135.1	738.1	346.7	4.15	0.76	0.55
International companies (7)				**248**	**467**	**304.7**	**945.7**	**2,503.1**	**1.53**	**0.49**	**0.16**
Kinetiko Energy	KKO	0.020	392	8	8	-	-	751.2	-	-	0.01
NuEnergy Gas	NGY	0.018	1,481	27	28	51.1	98.0	48.5	0.55	0.29	0.21
Strata-X	SXA	0.050	90	4	4	-	-	41.5	-	-	0.13
Tlou Energy	TOU	0.095	450	43	38	0.6	76.7	403.3	58.62	0.49	0.09
Triple Energy	TNP	0.014	72	1	1	-	-	-	-	-	-
G3 Exploration	G3E	0.665	156	104	351	252.9	771.0	1,258.6	1.39	0.46	0.20
Petro Matad	MATD	0.092	662	61	37	-	-	-	-	-	-

Source: K1 Capital analysis of company data. Expressed relative to the spot east coast Australian gas price of $6.88/GJ. See Table 3 for energy price equivalence factors.

3.2.2 Project metrics

G3 Exploration's annual reserves statement provides DCF based multiples for G3E's CBM projects in China, which provides a further reference point for valuing CBM resources. These range from ~$US4.30-4.70/GJ of 2P reserves at a 10% nominal discount rate for largely developed projects (the GSS and GCZ Blocks), equivalent to $6.30-6.90/GJ at the spot exchange rate of 0.68 $US/$A (and expressed on an energy equivalent GJ basis). The values appear to be internal rather than independent assessments. G3E's total assessed company value based on 2P reserves is $US2,467m, equivalent to ~$3680m at the spot exchange rate, which is 10.5 times the current market capitalization.

We draw two conclusions based on preliminary analysis: first, CBM projects in China can offer strong economics given the relatively high gas prices (and CBM subsidies), and second, the market, at least in this instance for G3 Exploration, appears to significantly discount the DCF value despite developed reserves and existing production and revenue. This may be due to concerns regarding debt levels and ongoing capital expenditure requirements for full field development.

Table 6 China CBM valuation metrics – G3 Exploration Limited projects

Parameter	Units	GSS Shizhuang Sth	GCZ Chengzhuang	GGZ Baotian-Qingshan	GSN Shizhuang Nth	GFC Fengcheng	GQY Quinyuan	GPX Panxie East
Reserves								
Location (province)	-	Shanxi	Shanxi	Guizhou	Shanxi	Jianxi	Shanxi	Anhui
PSC area (gross)	km2	388	67	947	375	1,541	3,665	584
Working interest	%	60.0	47.0	60.0	50.0	49.0	10-60	60.0
Chinese partner	-	CNOOC	PetroChina	PetroChina	CNOOC	CNOOC	CNOOC	CNOOC
Operator	-			Greka	CNOOC	Greka		Greka
Status	-	Prod'n	Prod'n	Dev't	Dev't	Exp/App	Exp/App	Exp/app
Equity wells drilled	-	1,328	114	45	192	31	69	12
Remaining wells to be drilled	-		147					
GIIP (net)	bcf	3,155	297	6,041				
1P (net)	bcf	114	15	1	5			
2P (net)	bcf	303	35	29	17	25		
3P (net)	bcf	1,023	60	101	672	229		
2C (net)	bcf			636			32	
Prospective (net)	bcf			368		209	736	15
EUR (net)	bcf	1,023	176	1,105	672	438	768	15
NPV								
1P	$US m	581	72	6	23			
2P	$US m	1,495	157	404	85	326		
3P	$US m	4,686	255	1,412	3,221	3,015		
NPV/GJ								
1P	$US/GJ	4.88	4.60	5.74	4.79	-	-	-
2P	$US/GJ	4.72	4.29	13.34	4.79	12.48	-	-
3P	$US/GJ	4.39	4.07	13.38	4.59	12.60	-	-
EUR/well								
1P	bcf/well	0.086	0.132	0.022	0.024	0.000	0.000	0.000
2P	bcf/well	0.228	0.307	0.644	0.089	0.806	0.000	0.000
3P	bcf/well	0.770	0.526	2.244	3.500	7.387	0.000	0.000
EUR	bcf/well		0.674					
GIIP/unit area of PSC	bcf/km2	13.6	9.4	10.6	-	-	-	-
EUR/unit area of PSC	bcf/km2	4.4	5.6	1.9	3.6	0.6	0.0	0.0

Source: K1 Capital analysis of company data from February 2019 investor presentation [9] and 2018 annual reserves report [10]. Company data assumed an average gas price US$8.98/Mcf for producing blocks and a USD/RMB FX ratio of 6.8. Assumes spot USD/AUD exchange rate of 0.68 and gas heating value of 0.99 MMBtu/kscf = 1.04 GJ/kscf.
EUR assumed equal to 3P + 2C + prospective in the absence of EUR reported by the company.

3.2.3 ASX-listed CBM transaction metrics

There is a large history of transactions involving acquisition of ASX-listed CSG companies or project interests, although activity in recent years has been subdued. Transaction prices have generally declined over time, in line with moderating global oil and LNG prices, but also with increasing maturity of CSG reserves. In some early transactions the metrics were probably impacted by early low values of the underlying reserves, which were expected to increase with further work. The quantum of the metrics also depends upon the nature of the interest acquired, with assets linked to LNG projects achieving a premium. Transaction metrics are shown in Table 7 below.

Transaction metrics for interests in CBM projects in China have ranged from ~$0.50/GJ to $1.50/GJ 3P reserves, with the most recent transaction in May 2018 (Lone Star acquisition of ASX-listed Sino Gas & Energy Limited). The acquisition value of $530m for Sino's interest in two PSCs was equivalent to just under $2.00/GJ 2P reserves.

Table 7 Australian and selected international CBM transaction metrics

Buyer / bidder	Seller / target	Date	EV M$A	EV/2P $A/GJ	EV/3P $A/GJ	Comment
International			**1,150**	**2.37**	**0.74**	
Pac Asia Pet Inc	MPO	Oct-09	10	52.13	0.86	26.1% Liulin, Ordos Basin, China, scrip, not concluded
Fortune Oil	MPO	Nov-09	7	34.75	0.57	26.1% Liulin, Ordos Basin, China, cash/scrip scrip
AOE	Fortune Oil	Dec-09	15	58.96	0.97	35% FLG (17.5% Luilin project), Ordos Basin, China
Sino Oil&Gas	Orion	Jul-10	337	0.00	0.51	Takeover, HK$2.34bn for 70% in Sanjiao Block, China
iGas	Dart Energy	May-14	211	5.50	1.70	Takeover, £117m scrip. UK/Aus assets. 4,994 2C resources
NuEnergy Gas	Dart Energy Indonesia	May-15	1	0.01	0.01	Takeover, $US1m cash. 3 PSCs, 109 bcf 2C
Lone Star	Sino Gas&Energy	May-18	530	1.98	1.47	Takeover, cash. Linxing & Sanjioabei, Shanxi Province, China
EPI Energy	Dart Energy Indonesia	Aug-18	0	0.00	0.00	MOU announced for part interest, did not complete
NuEnergy Gas	PT Medco CBM Pendo	Jan-19	0	0.00	0.00	Acquired 50% interest in Muralim PSC for nil consideration
Saujana E&P Sdn Bhd	NuEnergy Gas	Apr-19	39	0.56	0.15	51% interest in NGY; not completed. Assume 3P = 256 bcf 2C
LNG projects			**24,263**	**1.53**	**0.84**	
BG	QGC	Feb-08	415	1.58	0.67	Stage 1, excludes FID/2nd train bonus
Petronas	STO	May-08	2,114	3.93	1.32	Stage 1, excludes 2nd train bonus
Shell	AOE	Jun-08	435	1.83	0.52	Stage 1, excludes LNG FID and 1 Mtpa bonuses
Conoco	ORG	Sep-08	7,150	3.01	1.41	Initial+work program, excludes bonuses
BG	QGC	Nov-08	5,208	1.98	0.77	Takeover, $5.75 /share cash
Shell	AOE	Jul-09	99	0.71	0.30	Tipton West, 30% of 40% non-operating interest
Shell/PetroChina	AOE	Mar-10	3,472	0.94	0.60	Takeover, $4.70 cash Australian business only
Total	STO	Sep-10	867	1.08	0.73	20% interest in GLNG (inc. 5% from PETRONAS)
Total/Kogas	STO	Dec-10	665	0.89	0.57	7.5% interest each in GLNG
Sinopec	ORG/COP	Feb-11	1,400	0.83	0.64	15% interest (7.5% each) in APLNG
Sinopec	ORG/COP	Jan-12	1,058	0.94	0.72	Further 10% interest (5% each) in APLNG
CNOOC	BG/QGC	Oct-12	1,150	0.75	0.75	+40% interest in T1, +20% in Surat, 25% Bowen permits
APLNG	ORG	Feb-19	231	1.79	1.20	100% interest in Ironbark CSG tenement (ATP788P)
Company takeovers			**4,030**	**1.23**	**0.33**	
QGC	SHG	Aug-08	811	1.70	0.74	M$A1082 @ $A3.49 /SHG share
AGL	SGL	Dec-08	173	4.22	3.20	Takeover, $0.425 cash
BG	PES	Feb-09	1,010	1.94	0.40	Takeover, $8.25 cash, current reserves
Dart	Apollo	Sep-10	126	0.00	0.12	Takeover, 3 for 4 scrip, 1 mth VWAP, WHTM 3P target
STO	ESG	Jul-11	731	0.94	0.51	79.1% interest in ESG (already owns 20.9%)
Arrow	BOW	Aug-11	446	1.87	0.16	100% of BOW's issued capital
LNG Ltd	WCL	Feb-12	169	0.65	0.23	$0.65/share, reserves 16 Feb (bid 13 Feb); did not complete
PetroChina	WCL	Nov-12	189	0.73	0.26	$0.52/share; did not complete
Landbridge	WCL	Mar-14	136	0.39	0.15	$0.36/share
Landbridge	WCL	Apr-14	154	0.44	0.17	$0.40/share; 2nd bid
Project control			**2,383**	**1.32**	**0.50**	
AGL	BG (Lacerta)	Oct-08	856	1.80	0.78	Option to acquire Lacerta & Polaris, not concluded
AGL	AJL/MPO	Dec-08	370	2.10	0.97	Gloucester project, reserves at time of offer
AGL	AJL/MPO future	Dec-08	370	0.82	0.49	Gloucester project, expected future reserves
ORG	Pangaea	Apr-09	660	5.12	0.57	ATP 788P Undulla Nose Walloons (Ironbark), inc. 500 PJ 2C
WCL	Anglo	Mar-10	27	0.28	0.16	51% Dawson CSG gas fields (ML West & PL 94)
ERM Power	ROG/CMR	Jul-12	7	1.46	0.07	$7.45m for 30%, +6-9 wells in PEL 478/479/457 for 50-60%
ERM Power	ROG	Jul-12	10	2.94	0.13	3 yr option to buy remaining 20% of PEL 479/457
PetroChina	MPO	Aug-12	41	0.12	0.05	Qld CSG assets
GLNG	SXY	Sep-15	42	0.32	0.16	Maisey block, near Roma Gas Project. Assume 3P=2P*2
Minority interests			**2,008**	**1.28**	**0.49**	
AGL	QGC	Mar-07	327	1.28	0.43	27.5% of QGC @ $A1.60/share
AOE	BPT	Apr-09	330	0.71	0.30	Tipton West 40% non-operating interest
STO	ESG	Jul-09	461	2.86	0.74	35% Interest in JV and 19.99% interest in ESG.
STO	Gastar	Jul-09	300	2.55	0.66	35% JV interest in PEL 238 (and other tenements)
Toyota Tsusho	AJ Lucas	Dec-09	99	2.40	0.79	15% interest, Wollebee Creek, Surat Basin, ATP 651P
TruEnergy	ESG	Jul-11	284	0.93	0.51	20% interest in ESG's CSG permits
Stanwell	COI	Sep-11	7	0.25	0.13	5% of Mahalo for $7m
Stanwell	COI	Sep-11	73	0.88	0.44	2-3 yr Option A: 15% for $0.80/GJ 2P; assume 2P=2C
Stanwell	COI	Sep-11	127	1.15	0.58	2-3 yr Option B: 20% for $1.15/GJ 2P; assume 3P=3C
Total / Wtd Average			**33,259**	**1.46**	**0.66**	

Source: K1 Capital analysis of company data. EV excludes time value of bonus payments

3.3 Risked exploration value

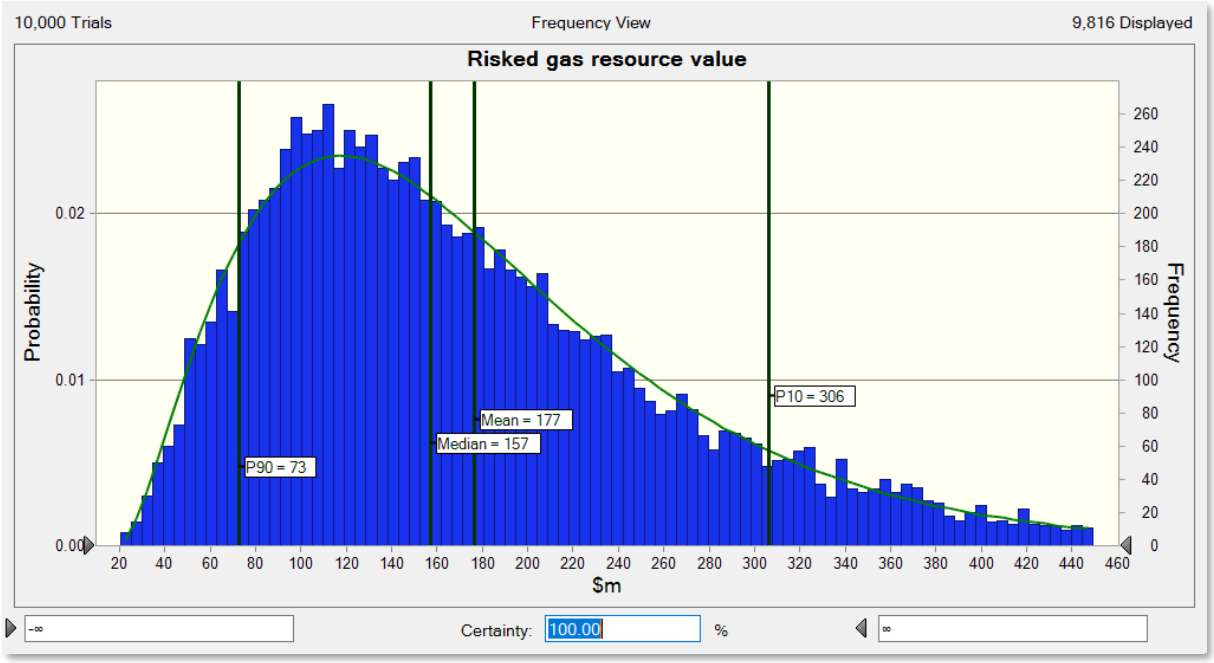
We have estimated the risked exploration value of Elixir's interest in the Nomgon IX PSC by applying adjustment factors to the November 2018 independent prospective resource estimate. We have applied a range for each factor to reflect the uncertainty in outcome at this time and used Monte Carlo simulation to estimate the distribution of valuation outcomes. The assumptions, distribution results and results sensitivity are summarized below. The assumptions with the largest impact on valuation range at this time are the resource size and EV/resource unit value.

Table 8 Nomgon IX PSC risked exploration valuation

Parameter	Units	Value	Low	Mid	High	Comment triangular distributions assumed for simplicity
Risked exploration: Nomgon IX PSC						
Working interest	%	100.0	100.0	100.0	100.0	per Elixir, Nomgon IX PSC
Prospective resources (gross, unrisked)	tcf	40.1	13.6	40.1	117.2	per ERP Equipoise, 19 Nov 2018
Geological risk factor	%	19.0	19.0	19.0	19.0	per ERP Equipoise, 19 Nov 2019
Prospective resources (net, risked)	PJ	7,958	2,699	7,958	23,260	= unrisked * geological risk factor * heating value
Conversion to contingent resources	%	50	30	50	70	assumed longer run value (1Q 2020 assessment will be less)
Estimated contingent resources	PJ	3,979				= Prospective * resource conversion factor
Conversion to reserves	%	60	40	60	80	upper case per K1 Capital analysis of Australian CBM
Estimated future 2P reserves	PJ	2,388				= Contingent * reserves conversion factor
Commercial chance of success	%	50.0	40.0	50.0	60.0	mid-case per ERP Equipoise, 19 Nov 2018
Gas resource unit value (energy equiv't)	$A/GJ	0.20	0.10	0.20	0.35	K1 Capital analysis of ASX, AIM companies
Time value adjustment	years	5.0	3.0	5.0	8.0	K1 Capital estimate, yrs to similar maturity as peers
Base nominal discount rate	%	10.0	8.0	10.0	12.0	K1 Capital estimate
Country risk premium	%	5.0	1.0	5.0	9.0	per Damodaran, NYU Stern: low = China, high = Mongolia
Time value adjustment factor	-	0.497				= (1+rb+rc)^-t
Risked gas resource value	$m	119				
Monte Carlo valuation		Mean	P90	P50	P10	
Nomgon IX PSC (Mongolia, 100%)	$m	**177**	**73**	**157**	**306**	per Monte Carlo simulation, 10,000 trials

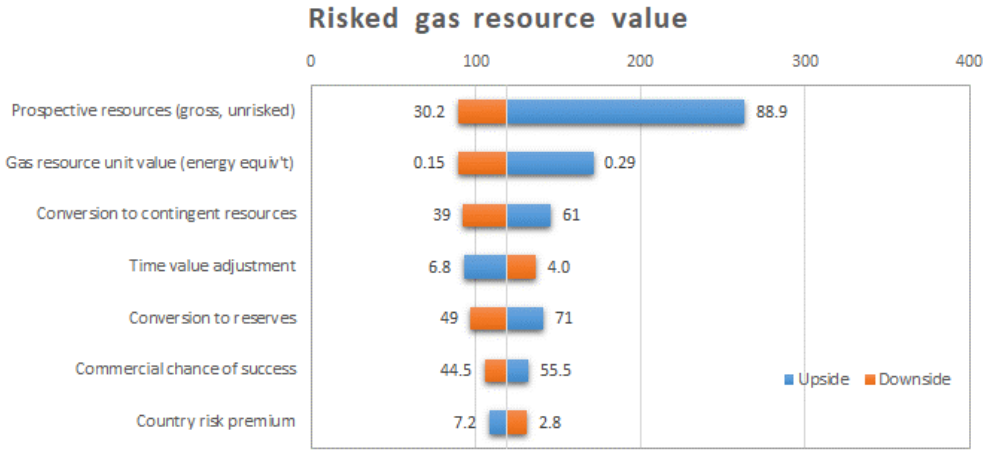
Source: K1 Capital analysis

Figure 9 Risked gas resource value distribution



Source: K1 Capital analysis

Figure 10 Tornado Chart



Source: K1 Capital analysis. Bar labels show the P90/P10 test range for each input variable.

3.4 Company valuation

Our estimate of the equity valuation for Elixir is summarized below. This incorporates the risked exploration value for the Nomgon IX PSC and assigns zero value to the Moselle and Petra projects. It includes anticipated dilution for the 2020 exploration program and expected exercise of share options and performance rights. The company valuation ranges from $75m to $308m, driven by the wide range in resource size and EV/resource unit value uncertainty.

Table 9 Elixir equity valuation

Parameter	Units	Value	Low	Mid	High	Comment triangular distributions assumed for simplicity
Valuation		Mean	P90	P50	P10	
Nomgon IX PSC (Mongolia, 100%)	$m	**177**	**73**	**157**	**306**	
Moselle Project (France, 100%)	$m	0				assume nil value
Petra Project (Colorado, USA, 25%)	$m	0				assume nil value
Existing cash	$m	4.4				per Jun 2019 quarterly
Existing debt	$m	0.0				
Exercise of options	$m	0.2				Sep-2019 in-the-money
G&A costs	$m	-1.7				$1.2m/yr, per Jun 2019 quarterly, to end 2020
2019 work program	$m	-3.6				2D seismic + 2-3 coreholes + testing
2020 work program	$m	-6.0				estimate (seismic, 3 spot pilot)
New capital required	$m	8.8				Maintain minimum $2m working capital balance
Total	$m	**179.0**	**75.0**	**159.0**	**308.0**	
Existing capital structure						
Current share price	$/sh	0.052				
Shares on issue	000,000	488.2				
Options at $0.0329, expiring 30 Sep 2019	000,000	7.0				
Options at $0.0679, expiring 31 Dec 2019	000,000	93.5				
Performance rights - Class C	000,000	7.5				drill two CBM coreholes
Performance rights - Class D	000,000	10.0				FID approval of CBM pilot program
Estimated dilution						
New capital required	$m	8.8				from above
Pre-raising market capitalization	$m	25.6				Current market cap + Sep 2019 options
Assumed raising discount to TERP	%	11.0				per K1 Capital analysis
Estimated capital raising discount	%	14.2				relative to current share price
Estimated price at which capital raised	$/sh	0.045				based on current share price
New shares issued	000,000	196.3				
Diluted share count	000,000	**709.0**				includes Sep 2019 options and Class C & D Perf. Rights
Estimated share price	$/sh	**0.252**	**0.106**	**0.224**	**0.434**	

Source: K1 Capital analysis

3.5 Valuation considerations

Table 10 Comparison of Elixir/Nomgon IX PSC to other ASX CBM companies/projects

Parameter	Mongolia	Australia	Botswana	Comment
Resource size	+++	+	+	Nomgon IX likely sufficiently large to attract the attention of international majors / NOCs
Gas price	+++	++	++	Gas prices in China higher than eastern Australia, similar to expected prices in Botswana
Existing infrastructure	+	-/+++	+	High voltage power transmission crosses permit, but no pipelines. Australia: Blue Energy effectively stranded until Arrow's Bowen Basin project proceeds. Comet's Mahalo project close to Gladstone, JV partners require more gas
Domgas demand	-	+++	-	No domgas market. Domgas market small given low population (similar to the situation in Botswana)
Export demand	+++	+	+++	Chinese market in proximity. Botswana has Southern Africa regional demand (but not as large or well developed).
Majors / NOCs active in country	++	+++	-	PetroChina/Sinopec involved in Mongolian oil industry
Ease of doing business	-	++	++	High country risk in Mongolia. Can be difficult for juniors to work with NOCs in China.

Source: K1 Capital assessment. +, ++, +++ denote relative strength, - denotes nil activity

Outlook: Australia's CBM industry offers few examples of juniors successfully transitioning from explorers to long-term gas producers. Of the 34 junior to mid-size companies we identified with interests in CBM since 2008, only six remain focused on CBM. Of those companies that commenced production, all but one (Senex) have been acquired by larger entities.

Instead of moving into production, success has more commonly been achieved by companies selling their projects or being acquired once the resource has been derisked. This has applied for juniors with no or negligible production (such as Sunshine Gas, Pure Energy, Bow Energy, etc.) as well as larger companies, such as QGC and Arrow Energy, which were acquired as part of the CSG to LNG industry transformation late last decade. CBM companies which were not acquired at that time are generally still working to demonstrate the commerciality of their projects.

We think the likely acquirers of an interest in Elixir's project or the company itself are Chinese NOC's given (1) their capability to develop and operate large scale resource projects, (2) proximity of Mongolia to their existing Chinese markets and (3) existing operations within Mongolia. The acquisition of Sino Gas and Energy by Lonestar in 2018 suggests that western private equity funds may also be interested in this style of project.

Hence, as was the case with the Australian CSG to LNG industry and with Sino Gas & Energy in China, we believe the value of the company will be ultimately be established by industry participants through a project or company transaction. Past transactions, as shown in Table 7 above, indicate that companies with large, well located, high quality resources can achieve strong interest.

Table 11 ASX-listed CBM companies: past and present

Company	Comment
Acer Energy	Acquired by Drillsearch Energy
AJ Lucas	Divested CBM, now focused on onshore UK shale
Apollo Energy	Acquired by Dart Energy
Arrow Energy	Acquired by Shell
Blue Energy	Queensland CBM appraisal, no active fieldwork
Bow Energy	Acquired by Arrow
Carbon Minerals	Activities in Gunnedah Basin on hold due to NSW regulatory issues
Central Petroleum	Now focused on NT conventional
Comet Ridge	Appraising Mahalo project and Galilee Basin (CBM and conventional)
Dart Energy	Acquired by UK iGas, May 2014, Aus and UK CBM and shale assets
Eastern Star Gas	Acquired by Santos
Eden Energy	Exited CBM, moved into technology, high strength concrete, etc.
Elixir Energy	CBM exploration in Mongolia
European Gas	Exited CBM, changed to Fitzroy River Corp Ltd, now a royalty company
Exoma Energy	Exited CBM, changed to The Gruden Group, then Sinetech Limited
Icon Energy	CBM interests on hold, shifted focus to shale/tight gas
L&M Energy	Exited CBM, acquired by New Dawn Energy Limited, Feb 2013
Metgasco	Sold Clarence-Morton basin assets to NSW Gov't due regulatory issues
Molopo	Exited CBM, moved to onshore US unconventional
NuEnergy Gas	Acquired Dart Energy's Indonesian CBM assets
Orion Petroleum	Exited CBM, named changed to Petrel Energy, then Warrego Energy
Planet Gas	Exited CBM, moved to Cooper Basin focus, name changed to Sky Metals
Pure Energy	Acquired by BG
Queensland Gas	Acquired by BG
Rawson Resources	Name changed to Rawson Oil & Gas, now focused on conventional
Redsky Energy	Divested NSW CBM, sold Queensland interests to ERM Power
Sino Gas & Energy	CBM in China, acquired by US PE firm, Lonestar, in May 2018
Sydney Gas	Acquired by AGL
Sunshine Gas	Acquired by QGC
Senex Energy	Originally conventional oil & gas, recent move into CBM
Strike Energy	Limited progress on Cooper Basin CBM, now focused on Perth Basin conv.
Strata-X	Recent entry into Botswana CBM
Tlou Energy	Active in Botswana
Westside Corp.	Acquired by Landbridge

Source: K1 Capital analysis of company announcements and records from InvestoGain Australia, https://www.investogain.com.au. Yellow highlighting denotes companies currently active in CBM
Excludes larger ASX-listed companies, with broader interests than CBM, such as Santos, Origin and Beach Energy (early interest in Tipton West).

4. Investment risks

Elixir is a single asset, early stage exploration company, operating in a country with business practices different to Western norms. Key risks relate to exploration outcomes, ongoing funding, access to markets and infrastructure and country risk.

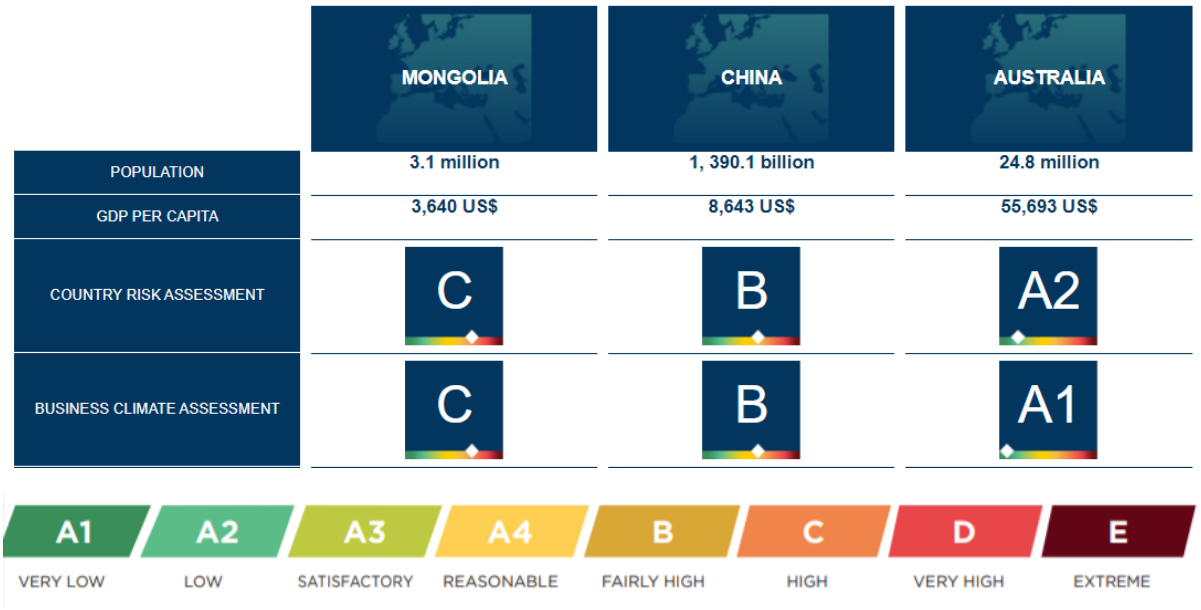
Exploration outcomes: The presence of thick and extensive coals is known through previous coal exploration drilling. However, the suitability of the coal for CBM development is not yet known. Even if suitable for CBM the optimal extraction methods may take significant time to develop. By way of example, companies such as Tlou Energy in Botswana (Lesedi project), Comet Ridge in Queensland (Mahalo project) and Galilee Energy in Queensland (Glenaras project) have been working on demonstrating commercial CBM extraction rates for 6, 10 and 15 years respectively.

Funding: Elixir is fully funded for the current seismic and core hole program. However, additional capital will be required to construct and operate a pilot program before commercial flow rates can be demonstrated. Access to ongoing funding will be linked to exploration outcomes and the rate of project derisking will be linked to the availability of funding.

Access to infrastructure: The Nomgon IX PSC exists in a country without a commercial gas market. Pipeline transmission infrastructure or onsite power generation linked to electricity transmission lines will be required to commercialize any discovered gas.

Country risk: Various reports note the relatively high levels of corruption within Mongolia, internal political disputes, social tension arising from internal migration and concerns regarding the distribution of mineral wealth, and high exposure to commodity prices and trade with Russia and China. Although country financial risk does not necessarily relate to project operating risk, it provides a measure of risk which equity markets consider. Aswath Damodaran, from New York University's Stern Business School assigns country risk premia of 9.0% to Mongolia, based on Moody's country risk rating of B3, the same as Greece, Egypt, Pakistan; with 1.0% to China and 0.0% to Australia [11].

Figure 11 Country risk comparison



Source: coface.com, accessed 5th September 2019. [12], [13]

4.1 SWOT analysis

Table 12 SWOT analysis summary

Strengths	Weaknesses
▪ Large prospective resources (7.6 tcf mid-case). ▪ Well located with respect to gas demand ▪ Existing power transmission lines passing through PSC have spare capacity for generation ▪ Limited competing land use (some grazing). ▪ Relatively low-cost exploration and appraisal. ▪ Strong in-country relationships ▪ Potentially low CO_2 gas (yet to be confirmed) ▪ Ability to stage onshore development	▪ Investor sentiment towards exploration companies remains subdued in the current environment. ▪ Will require ongoing funding to progress further activity, regardless of exploration outcomes ▪ "Frontier" exploration in Mongolia. ▪ Country risk. ▪ Relatively immature petroleum regulatory regime
Opportunities	**Threats**
▪ Farm-out at appropriate time for value uplift. ▪ Asian Super Grid / China Belt and Road programs may stimulate/accelerate investment and provision of infrastructure ▪ Gas fired power generation to support renewables generation ▪ Increased power generation required for Oyu Tolgoi mines (currently imported from China)	▪ Exploration outcomes. ▪ Volatile commodity prices could impact farm-in appetite. ▪ Potential opposition to onshore development by special interest groups. ▪ Cost overruns / schedule delays ▪ Delays due to political unrest / changes of government

Source: K1 Capital analysis

4.2 Near term funding

We estimate Elixir will need additional funding to progress is 2020 exploration program. The price at which future capital is raised cannot be known with certainty in advance. We assume the 2020 raising is conducted at a price which provides an 11% discount to the theoretical ex-rights price, consistent with the average discount based on our analysis for secondary raisings for junior resource companies. We have assumed for the purposes of estimating dilution that the base case share price prior to the raising is equal to the current share price. We have not incorporated dilution (or capital in the valuation) for the potential raisings beyond 2020, given the uncertainty regarding future exploration programs and the future share price.

Table 13 Near term cash balance (calendar year basis, nominal dollars)

Item	2H19 M$A	CY20 M$A	CY21 M$A	Comment
Opening Balance	**4.4**	**1.9**	**3.0**	Jun 2019 opening balance
Sales revenue	0.0	0.0	0.0	
Administration	0.6	-1.2	-1.2	
Moselle/Petra divestment	0.0			assumed negligible
2019 exploration	-3.4			seismic + 2-3 coreholes
2020 exploration		-6.0		seismic + coreholes + pilot
2021 exploration				?
Options	0.2			
New equity		8.8		
Capital raising costs	0.0	-0.4	0.0	assumed 5%
Industry farm-out				
Closing Balance	**1.9**	**3.0**	**1.8**	

Source: K1 Capital analysis. Crimson font denotes uncertainty.

5. Board and management

Elixir's proposed board and management have significant previous experience with CBM exploration and production companies. The necessary technical, commercial and operating capabilities appear to be well covered for the current exploration program.

Table 14 Board of Directors and Senior Management

Board
Mr Richard Cottee – Non-Executive Chairman Appointed 29th April 2019. LLB, University of Queensland Mr Cottee is a lawyer with over 30 years' experience in the energy industry, including roles as CEO at CS Energy, NRG Europe, Central Petroleum, Nexus Energy and Queensland Gas Company. QGC was a CSG company acquired by BG Group for $5.7 billion.
Mr Neil Young – Managing Director and CEO Appointed 14th December 2018. MA (Hons) in Economics/Politics, University of Edinburgh Mr Young has more than twenty years' experience in senior management positions in the energy sector, focusing on business development, new ventures, gas marketing and general commercial functions with EY, Tarong Energy and Santos. Mr Young founded Golden Horde Ltd in 2011.
Mr Stephen Kelemen – Non-Executive Director Appointed 6th May 2019. BE, Adelaide University Mr Kelemen has ~40 years' experience in oil and gas, leading Santos' CSG team from its inception in 2004. He is currently an Adjunct Professor at University of Queensland's Centre for Coal Seam Gas and is a non-executive director of Galilee Energy (ASX: GLL) and Advent Energy (unlisted).
Senior Management
Byambasaikhan Bayanjargal – Mongolian Strategic & Financial Adviser National University of Mongolia and George Washington University Mr. Byambasaikhan is a co-founder of NovaTerra, a Mongolian investment advisory firm and chair of the Business Council of Mongolia. He was previously the CEO of Mongolia's sovereign investment company, Erdenes Mongol, CEO of Newcom, a Mongolian technology investor, and an energy banker at the Asian Development Bank. He is a Trustee of the National University of Mongolia, Zorig Foundation USA, Arts Council of Mongolia and is an Honorary Consul of South Africa.
Achitsan Buyannemekh – Country Manager BA(Hons) and MBA from Cardiff Metropolitan University (previously University of Wales Institute, Cardiff) Mr Achitsan started his career with Just Group LLC in 2010 as an analyst and became an advisor to Golden Horde Ltd in 2011. He managed foreign relations for the Mongolian Wind Energy Association from 2012-2015.
Bayarsaikhan Zagdaa – Geophysical Supervisor Master of Technical Science, Kazakh Polytechnic Institute. Mr Bayarsaikhan has 15 years' experience in seismic data acquisition and processing in Mongolia, Uganda, the DRC and Republic of Congo.
Zorigtbaatar Rentsen – Consultant BE (Mining), Technical University of Košice, 1981 Mr Zorigtbaatar worked as an engineer with the Umnugovi Aimag Water Authority from 1981-1985, as a soldier in 223th military class from 1985-1986, with the Mongolian People's Revolutionary Party until 1992 and then as an engineer at Tavan Tolgoi until retirement in 2017.
Tumurbaatar Zagar – Consultant Polytechnic College of Ulaanbaatar, 1966. Mining engineering, Russia, 1979 Mr Tumurbaatar was the head of the Sharyn Gol coal mine from 1966-1973, before studying open pit mechanization and engineering in Russia, returning to Sharyin Gol in 1979. He served as the Deputy Director General, Policy and Planning at the Ministry of Fuel and Energy from 1991-2008, and then General Director of the Mining Department at the Ministry of Mining and Geology.

Source: Elixir Energy Limited, website, accessed 29th August 2019

6. Appendices

6.1 Petroleum reserves and resources classification

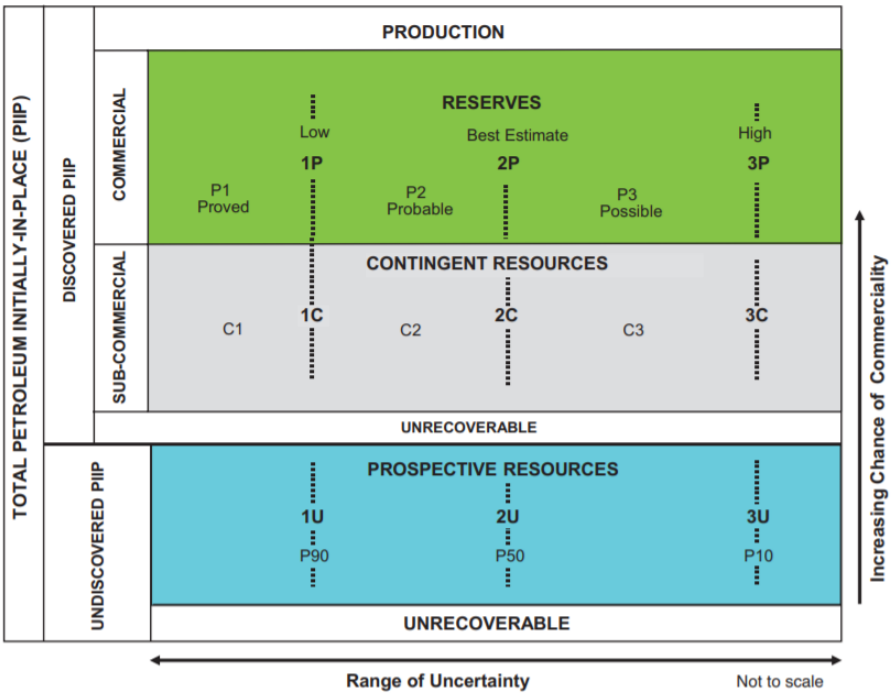
Petroleum in the ground cannot be readily measured. This gives rise to uncertainty regarding the amount in place or ultimately recoverable. The Petroleum Reserves Management System seeks to categorize reserves and resources according to this uncertainty.

- Reserves are those quantities of petroleum that are anticipated to be commercially recoverable by application of projects to known accumulations. Hence reserves must be discovered, recoverable, commercial and remaining, based on the project or projects that will be applied.
- Contingent resources are those quantities that are discovered but are not yet mature enough for commercial development (e.g. no viable markets, recovery dependent upon technology, evaluation at an early stage, legal title unclear, etc.)
- Prospective resources are those quantities that are estimated to be potentially recoverable from undiscovered accumulations.

The relative degree of uncertainty is conveyed by categories: 1P and 1C categories have a 90% probability of the amount being recovered exceeding the 1P and 1C level; 2P and 2C categories have a 50% probability of exceeding the quantity; and 3P and 3C categories have a 10% probability.

The following chart shows the relationship between the various petroleum reserve and resource categories.

Figure 12 SPE-PRMS Petroleum Reserves Management System Classification



Source: Guidelines for Application of the Petroleum Resources Management System, June 2018, [14]

6.2 CBM resource classification practice

CBM resource classification is commonly based on "well spacing" concepts. This approach assumes uncertainty increases as the distance to well control increases, resulting in a progression from Proved to Probable to Possible Reserves (and resources). Under this approach all the Developed reserves are Proved, and Undeveloped reserves may be Proved, Probable or Possible. Consequently, 1P and 2P reserves grow over time toward a 3P value. It is also not unusual to see growth in the 3P component as Contingent and Prospective Resources are converted to Reserves.

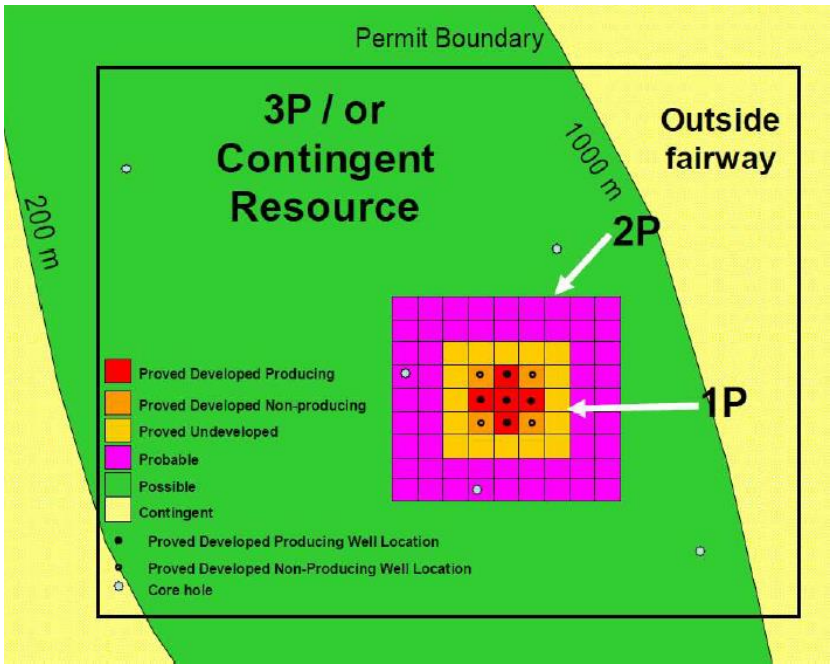
This produces a different reserves maturation profile over time than for conventional petroleum, where the reserve classification is based on uncertainty in recovery and 1P and 3P reserves trend towards the 2P value over time.

Proved Developed Reserves. This applies to the nominal drainage area for producing or non-producing wells that are proven to have commercial quantities of recoverable gas. Well spacing varies depending on the region: typical drainage areas for vertical wells are 80 to 320 acres and up to 550 acres in the Fairview/Spring Gully fields.

- Proved Undeveloped Reserves. Typically one well spacing from Proved Developed location (in some instances this may be increased to two well spacings if the permeability is high and regional experience justifies good lateral continuity of the coals).
- Probable Reserves. Typically two well spacings from Proved location (this may be extended to greater distances between Proved areas if coal geology, coal quality, and local experience permits).
- Possible Reserves. Typically two well spacings from Probable location (this may be extended if coal geology, quality, and local experience permits or constrained by geological/geographical limits).

The current conventions are illustrated below. The 200 m and 1000 m depth contours represent the vertical limits of anticipated commercial production for this example.

Figure 13 Reserve classification well spacing relationship



Source: Guidelines for Application of the Petroleum Resources Management System, November 2011, pp. 148-150

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