



ELIXIR ENERGY (ASX:EXR)

# **Discover Mongolia Conference**

## *Coal Bed Methane for Multiple Markets*

27 September 2019

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Information contained in this report with respect to the potential of the Mongolia PSC area was compiled by Elixir based on independent reports and was reviewed by Mr Greg Channon, technical adviser to Elixir who has had more than 30 years' experience in the practice of petroleum geology. At this time, Elixir and Mr Channon make no representations or forecasts with respect to the potential prospective resources that may be associated with the Mongolian PSC area.

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# Company Overview



## Exploring for Coal Bed Methane (CBM\*) in the South of Mongolia

- Focused on the 100% owned Nomgon IX Coal Bed Methane (CBM\*) Production Sharing Contract (PSC) project in the South Gobi region of Mongolia
- The 7 million-acre (~30,000 km<sup>2</sup>) PSC covers a major Permian coal bearing basin on the border of Mongolia and China
- CBM risked prospective resource of 7.6 Tcf (best case – see Appendix 1)
- Active exploration program underway
- Multiple market options, including the rapidly growing Chinese gas market
- Highly experienced CBM team

\* - CBM is generally referred to as CSG in Australia

CAPITAL STRUCTURE	Current (A\$million)
Ordinary Shares (ASX:EXR)	487.2
Unlisted Options (ex 3.29 cents)	7.0
Listed Options (ex 6.79c by 31.12.20)	110.7
Performance Shares (Milestones)	32.5
Market Capitalisation (at 5.5c)	\$26.8
Cash at Bank (per 30/6/19 5B)	\$4.4M
Enterprise Value	\$22.4



# Board of Directors

## Highly experienced CSG team



**Richard Cottee**  
Non-Executive Chairman

- Former Managing Director of CSG focused Queensland Gas Corporation (QGC), taking it from market cap of \$20M to \$5.7B
- Other former CEO positions include CS Energy, NRG Europe & Central Petroleum



**Neil Young**  
Managing Director

- Former Business Development Manager at Santos, where he helped build Santos' CSG business
- Has worked in Mongolia since 2011



**Stephen Kelemen**  
Non-Executive Director

- Extensive technical and commercial career at Santos, including managing its CSG business
- Current Non Executive Director at CSG focused Galilee Energy (ASX:GLL)



**Bayanjargal Byambasaikhan**  
Strategic Adviser

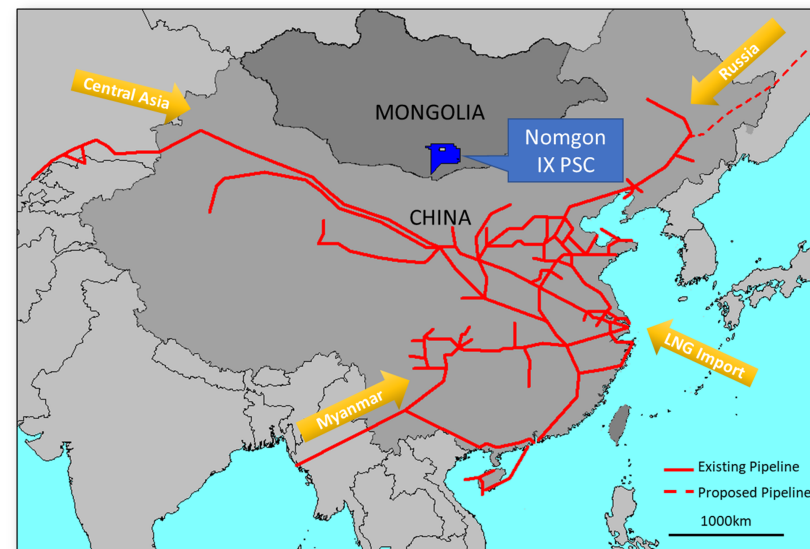
- Chairman of Business Council of Mongolia (BCM)
- Former CEO of Mongolia's sovereign investment company, Erdenes Mongol (EMGL)

# Nomgon IX CBM PSC

## PSC gives long term and robust tenure over massive licence area

- CBM PSC signed in September 2018 with a 10 year+ exploration term
- 100% ownership and no back-in rights as in China
- Strong relationship with Mongolian Government built over nearly a decade
- The Mongolian PSC has fiscal and other terms designed for unconventional petroleum
- The South Gobi Basin hosts Permian coals (see Appendix 2 for comparison with Australia's Bowen Basin)

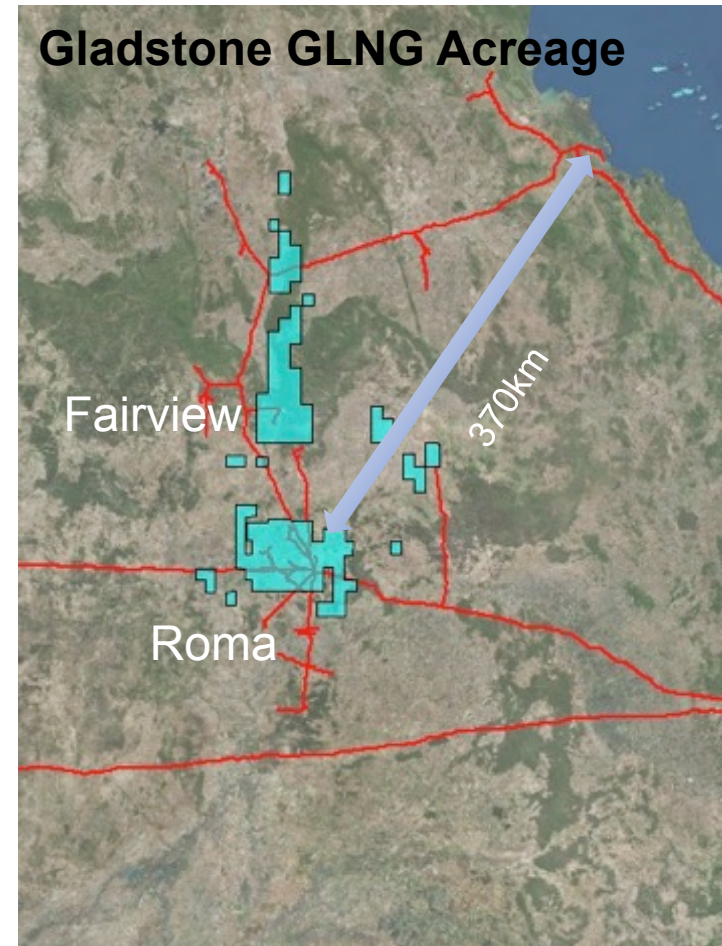
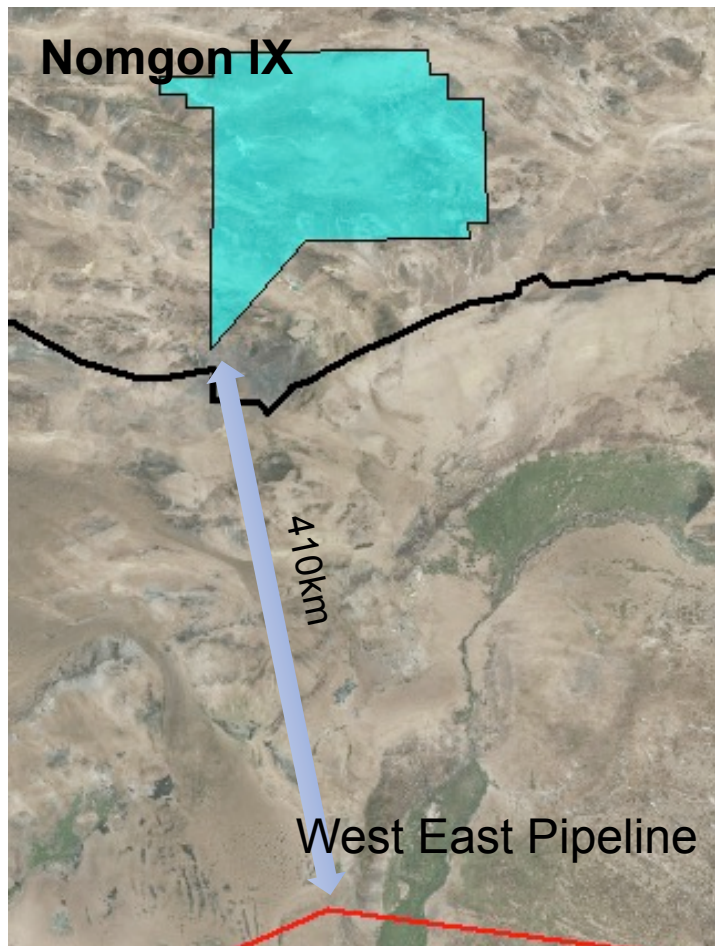
Exploration term	10 – 15 years
Production term	30 years +
Royalty	5 – 10 %
Govt share of profits	Up to 40%. No income tax
Back-in rights	None





# Export Scale Acreage Package

Extensive licence area and globally short pipeline distance



# Regulatory Approvals Completed

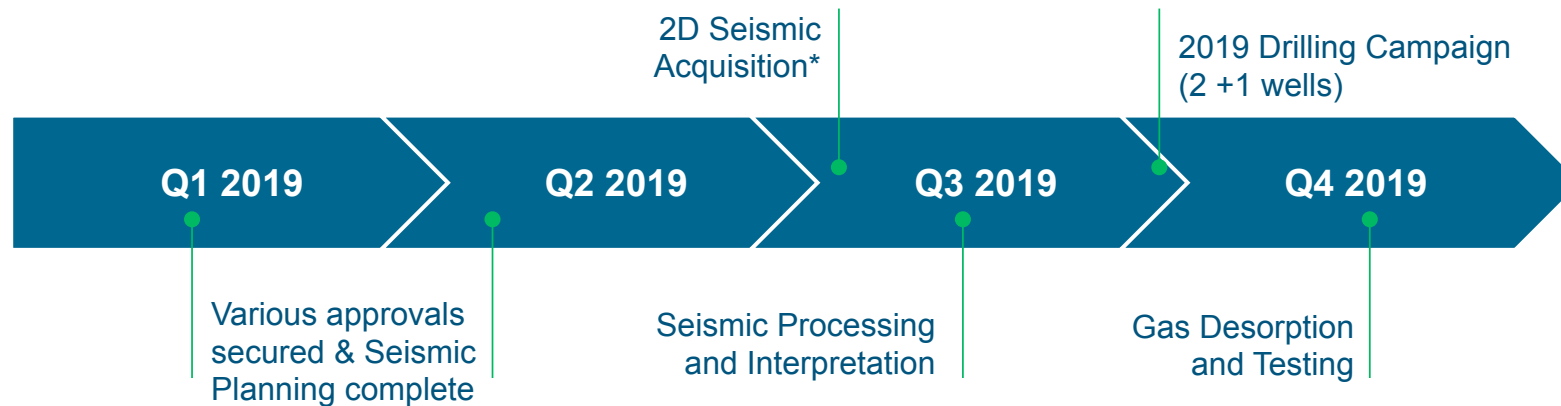
Significant work completed, exploration underway



# 2019 Exploration Program



## Timeline on track, history of delivery



### 2019 Exploration Program in Nomgon IX to deliver:

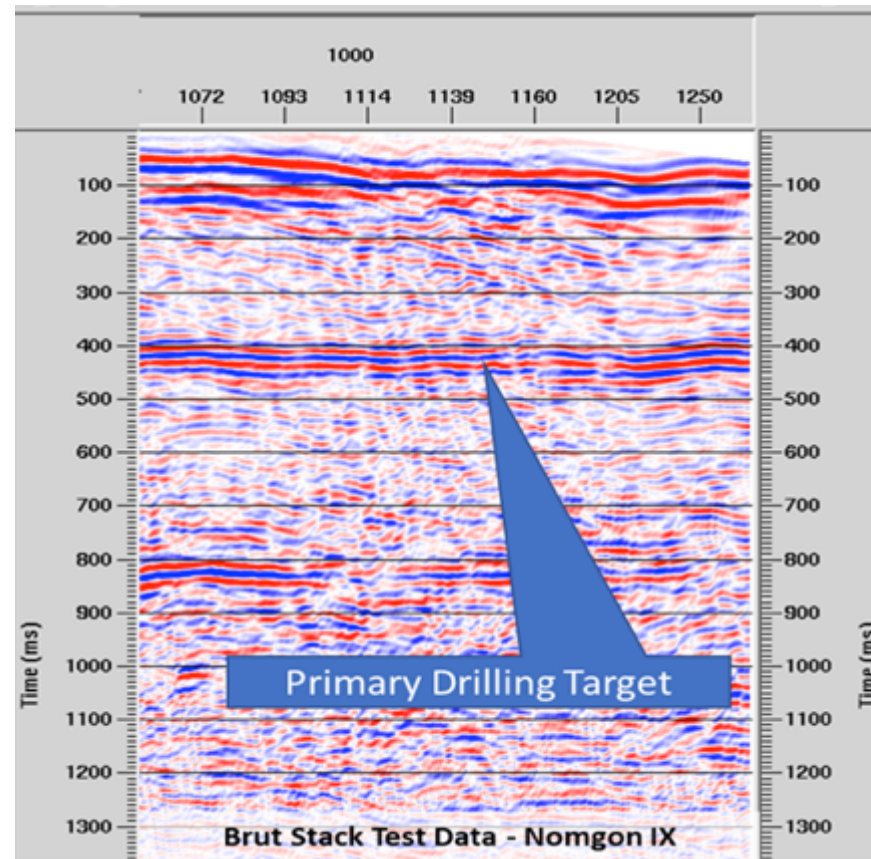
- 1 Presence and thickness of coal
- 2 Gas content
- 3 Gas composition
- 4 Permeability
- 5 On the path to contingent resources (Appendix 3)



# Seismic Acquisition Completed

## Targeted 2D seismic acquisition

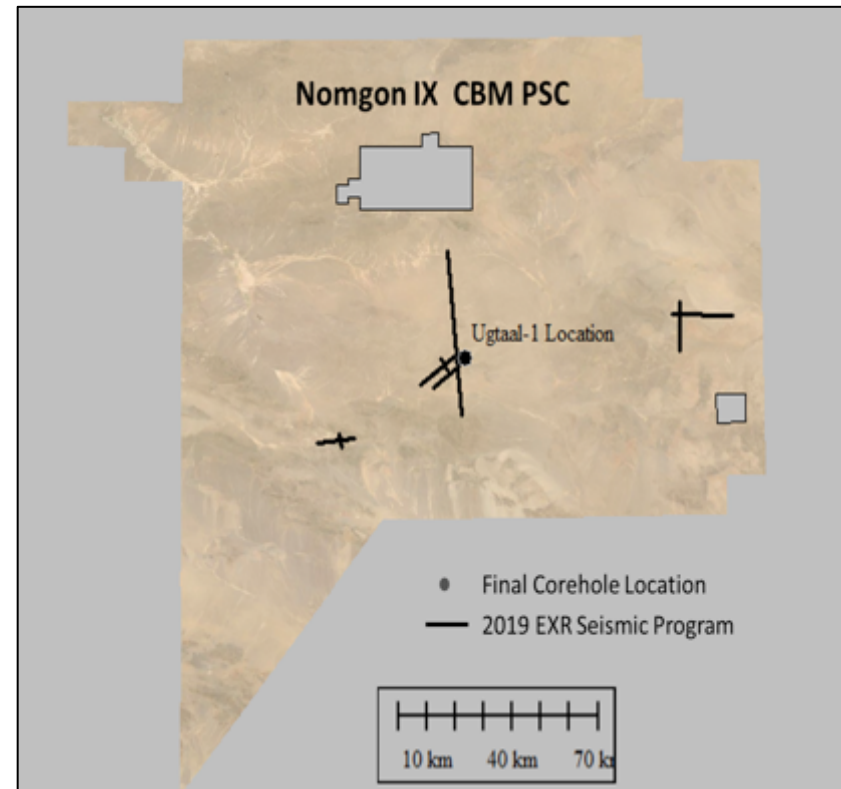
- Commenced seismic acquisition in August 2019 – finished in September
- Partnered with Mongolian contractor Micro Seismic LLC - who has substantial experience in the region
- Acquired 131 km of 2D seismic over key CBM leads
- Acquisition ~1 month, processing 20 days, full interpretation 20 days
- The seismic indicates coal seams at the right depths
- Fast track data used to site core holes



# Drilling Imminent

## Two core holes scheduled, option for a third

- First well (Ugtaal-1) due to spud late September/start of October
- Elixir and Mongolian contractor Erdenedrilling LLC have sourced testing equipment and experienced personnel from the USA and Australia
- Program of 2+1 core-holes with:
  - Full HQ coring, desorption, wireline logging & IFOT (injection fall off test)
- Timeline of 15-20 days per well including ~300-400m of coring
- Desorption testing to USA/Australian standards
- Wells to be remediated after testing



# Multiple Market Opportunities

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## Nomgon PSC has multiple sources of potential demand

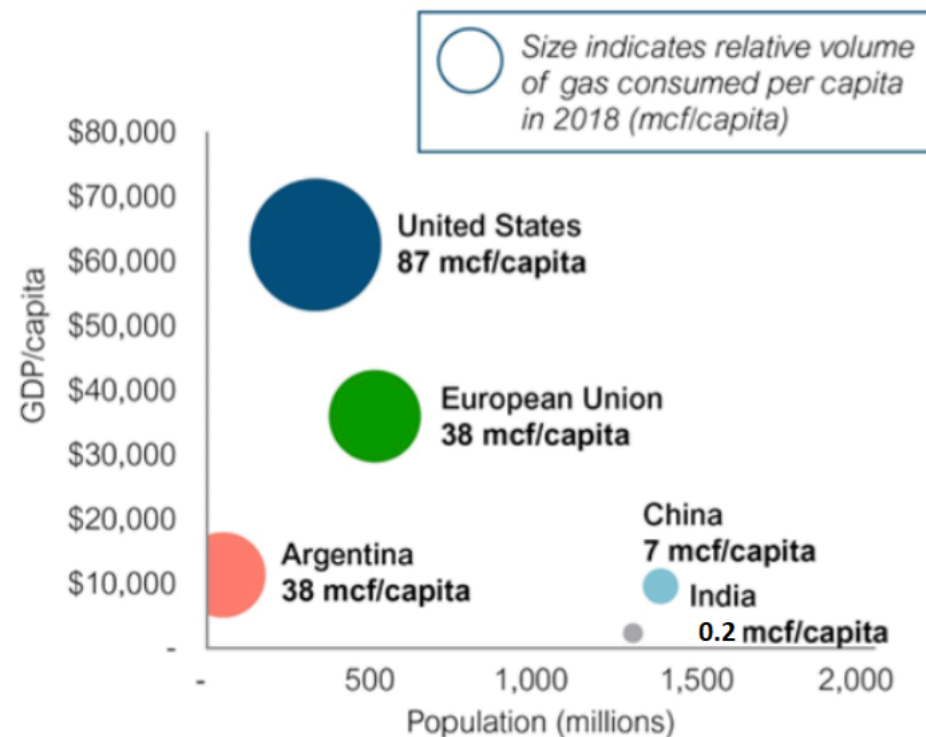
- Proximity to China – the largest global importer of energy and mineral resources, a key strategic advantage for Mongolia
- Multiple other market opportunities include:
  - Mongolia's largest energy user – the Oyu Tolgoi mining complex located inside the Nomgon PSC
  - Converting local gas to electricity – the Nomgon PSC is crossed by major electricity transmission lines
  - Gas and renewables are symbiotic – the South Gobi region has significant renewable resources
  - Well located, low cost and large-scale gas resources attract new forms of gas demand



# Next Door to China's Gas Market

## China has a rapidly growing appetite for gas

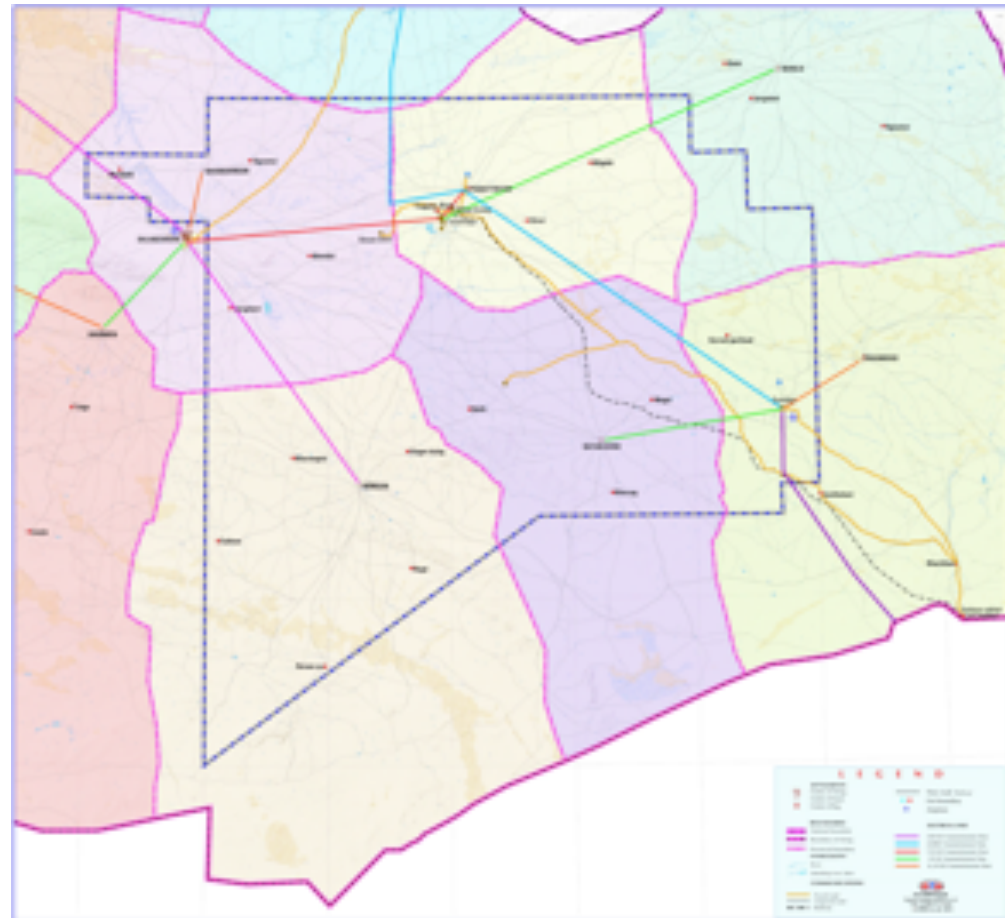
- The Chinese Government plans to increase gas demand by 300% over the next 15 years
- China imports gas from every direction and seeks to continually diversify its sources of supply
- The Nomgon IX CBM PSC is located on the border of Mongolia and China
- Mongolian CBM expected to be cost competitive compared to alternative sources of gas seeking to supply the China market
- Gas can be effectively exported by pipeline or electricity transmission



# Gas to Electricity

## Gas can generate electricity locally to supply the Nation

- The Nomgon PSC contains considerable existing electricity transmission infrastructure
- A large scale 220 kV line runs South from Ulaanbaatar to Oyu Tolgoi with substantial spare capacity
- A 330 kV line imports power from China to Oyu Tolgoi
- Mongolia's existing electricity supply fleet is near breaking point with new generation required but delayed
- Electricity generated in the South Gobi and delivered into the national grid reduces coal-fired pollution in Ulaanbaatar





## Gas is an alternative power source for Oyu Tolgoi

- Oyu Tolgoi required to seek power from within Mongolia under the Investment Agreement
- Progress to date has been slow, with delays from various stakeholders
- International financial institutions increasingly moving away from new coal fired power generation
- In May 2019, Rio closed the coal fired generator supporting its Kennecott Utah copper operations, replacing it with renewables & gas



*Oyu Tolgoi needs local power*

*“Rio Tinto is committed to playing a part in the transition to a low-carbon economy” - JS Jacques on 1 May 2019*

## The South Gobi hosts significant renewable resources

- Maximising the benefits of Mongolia's renewable resources (centered in the South Gobi) requires greater regional connectivity
- Substantial progress is being made in promoting the "Asian Super Grid" with Mongolia to play a critical role in supplying clean energy to the region
- Renewables are intermittent, but gas can "firm" up supply
- Global oil and gas majors consider gas and renewables as symbiotic – this lies at the core of their strategies
- CBM in the South Gobi is co-located with considerable wind and solar resources



*Soft Bank's Tsetsii wind-farm located in the Nomgon  
IX CBM PSC*

# Creating New Demand

## Cheap sources of gas attract new demand

- Gas can be delivered to existing markets by pipeline or electricity networks
- Cheap & large-scale gas resources attract new industries to co-locate
  - The Moranbah CBM field in North Queensland now hosts a large explosives plant that uses gas as its main feedstock
- Other chemical manufacturing processes where gas is a critical input include fertilisers and methanol
- Mongolia's proximity to China provides an economic fillip to the creation of such new industries



*Incitec's Moranbah plant – built on local CBM*

# The Hydrogen Economy

Hydrogen is increasingly seen as a key tool to deal with climate change

- In the long term, a green steel industry will require coking coal to be replaced with hydrogen
- Hydrogen is not available naturally and needs to be created in a clean fashion to be a green alternative
  - One way is to crack methane – and sequester the resulting carbon dioxide - this is called “Blue Hydrogen”
- Depleted coal seams should be capable of large-scale carbon capture and storage
- Moving hydrogen is expensive and Mongolia’s location again has the potential to be a key advantage



*European steel makers are already researching using hydrogen – China not far behind?*



# Investment Highlights

## Elixir has a highly favourable risk-reward profile

- First CBM PSC in Mongolia, signed in 2018 with 10 year+ exploration term
- High Quality Board & Management with history of success in CBM
- Massive PSC with large prospective resources (Appendix 1)
- Capital efficient exploration process for CBM
- Strong relationships across Mongolia
- Fully funded initial exploration program underway
- Aiming to establish contingent resource by early 2020
- 100% ownership position maximizes optionality
- Multiple market channels, including fast growing Chinese gas market
- Gas symbiotic with high quality renewable resources demanded in Asia





# Contact Us

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## INVESTORS & MEDIA

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## Appendix 1:

# Independent Prospective Resource Report



- First **independent prospective resource** report completed by ERC Equipoise Pte Ltd (ERCE) using 2018 SPE PRMS standards<sup>1</sup>
- Giant resource identified with Geological Risk likely to be **significantly reduced** following 2019 exploration programme (2D seismic and core hole drilling)
- ERCE report **independently validates world class potential** of the Nomgon IX CBM PSC and the “size of the prize”

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

**\* Cautionary Statement:** The estimated quantities of petroleum that may be potentially recovered by the application of a future development project relate to the undiscovered accumulations. These estimates have both an associated risk of discovery and a risk of development. Futher exploration, appraisal and evaluation are required to determine the exisistence of a significant quantity of potentially movable hydrocarbons.

<sup>1</sup>Refer to ASX announcement dated 19 November 2018. The Company is not aware of any new information that materially affects the information in that announcement.

## Appendix 2:

# The Bowen and South Gobi Basins Compared



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 <sup>3</sup> /tonne in most productive areas	Up to 15m <sup>3</sup> /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

## Appendix 3:

# Road to Contingent Resource Booking



	ACTIVITY	OUTCOME	RESOURCE CATEGORISATION UPON SUCCESS
COMPLETED	Geological Modelling	40 TCF unrisked) Recoverable (Best Case)* COS: 19% *	Prospective Resource (Lead) <sup>1</sup>
	Additional Data from Mineral Exploration Programs	More evidence of coal - COS could increase	Upgrades Prospective Resource <sup>2</sup>
REMAINDER OF 2019	2D Seismic Acquisition	Map coal over a larger area	Upgrades Prospective Resource <sup>2</sup>
	Core Drilling and Core Recovery	Total Gross Coal thickness	Success case delivers a DISCOVERED PETROLEUM ACCUMULATION which could be a Contingent Resource <sup>2</sup> – this will be independently verified around year end
	Laboratory Core Desorption	Gas Content and Gas Composition & Adsorption Isotherm (gas saturation)	
	Core Proximate Analysis	Dry Ash & Moisture Content	
	Wireline Logging	Total net coal thickness and distribution	
	Drill Stem Testing and Injectivity	Flowability and permeability measurements	

\* Refer Appendix 1

<sup>1</sup> Independently Verified by ERCE

<sup>2</sup> Internal estimate