



Level 12, 301 Coronation Drive,  
Milton QLD 4064 Australia  
PO Box 2118, Toowong DC  
QLD 4066 Australia

phone + 61 (0) 7 3337 9944

fax + 61 (0) 7 3337 9945

[www.carbonenergy.com.au](http://www.carbonenergy.com.au)

Carbon Energy Limited

ABN 56 057 552 137

Carbon Energy (Operations) Pty Ltd

ABN 61 105 176 967

25 October 2011

ASX Limited  
10<sup>th</sup> Floor, 20 Bond Street  
SYDNEY NSW 2000

**RE: Carbon Energy Limited – Investor Presentation**

Carbon Energy Limited (ASX Code: CNX and OTCQX: CNXAY) is pleased to provide a copy of the Investor Presentation.

Yours Faithfully



Prem Nair  
CFO & Company Secretary





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# Carbon Energy

ASX: CNX OTCQX: CNXAY

*Low cost, low emission energy has arrived*

Andrew Dash Managing Director

October 2011



# Important Statements

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## Competent Persons

The information in this presentation (where it relates to resources) is based on information compiled by Dr C. W. Mallett, Executive Director Carbon Energy Limited who is a member of the Australian Institute of Mining and Metallurgy. Dr Mallett has sufficient experience which is relevant to the style of mineralization and type of deposit under consideration and to the activity which he is undertaking to qualify as a Competent Person as defined in the 2004 Edition of the "Australasian Code for Reporting of Exploration Results, Mineral Resources and Ore Reserves". Dr Mallett consents to the inclusion in the presentation of the matters based on his information in the form and context in which it appears.

The reserve estimates used in this document were compiled by Mr Timothy Hower of MHA Petroleum Consultants, Colorado, USA, a qualified person under ASX Listing Rule 5.11. Mr Hower has consented to the use of the reserve information contained within this document in the form and context in which it appears.



# Carbon Energy

Carbon Energy is an emerging energy company. Our business is transforming stranded coal resources into high-value fuels with lower emissions to meet the increasing global demand for new, low cost, alternative energy sources.

## Strategic Objectives

<b>Resource:</b>	Build an International Portfolio of Coal Assets Suitable for UCG
<b>Technology:</b>	Apply Superior UCG Technology
<b>Markets:</b>	Supply UCG Syngas to High-Value Downstream Markets



# Carbon Energy Equity Overview

(ASX: CNX) (OTCQX: CNXAY)

Shares on issue 698.5 million

Market Capitalisation: AU\$105 million (@ AU\$0.15ps)

Quoted on the OTCQX in June 2011

Admitted to S&P/ASX 300 Index September 2008

- S&P/ASX Energy Index
- S&P/ASX Oil and Gas Explorers Index

Major Corporate and Institutional Shareholders

- Corporate (Incitec Pivot Limited) 9.6%
- Institutional 9%
- Pacific Road Resources Fund 9%
- Pacific Road Investor 4.9 %
- CSIRO 4%



## Milestones 2011 - Resource

- Maiden Resource Statement in Chile
  - 103 million tonnes at 2 metre coal seam thickness (83.6 million > 5 metre coal seam thickness. Measured: 26 Million Tonnes, Indicated: 37 Million Tonnes, Inferred: 40 Million Tonnes)
  - Estimated 1,100 PJ of recoverable syngas
  - Capable of running a 300 MW plant (approx 20 PJ p.a) for 55 years, generating \$262 million p.a @\$100/MWh
  - Carbon Energy has the right to a 30% contributing interest
- Further diversification into international markets
  - Wyoming & North Dakota/Montanna, USA
  - Amasra, Turkey



## Milestones 2011 - Keyseam

- Successful operation of UCG Panel 2 for 7 months
  - Production of consistent quality gas
  - Heating values exceeding the Company's target range of 5-6 MJ/m<sup>3</sup>
  - Generation of electricity into on-site load bank
  - Successful demonstration of automated Controlled Retraction Injection Point (CRIP)



# Capital Raisings

- \$10 m Convertible Loan Facility with Pacific Road Capital
  - 25% premium to the Rights Issue Price (subject to certain adjustments)
- \$10 m Rights Issue
  - Issue Price \$0.12 per share
  - Opening Date of Offer: 27 Oct 2011
  - Closing Date of Offer: 10 Nov 2011
  - Commencement of trading of new shares: 21 Nov 2011



# Capital Raisings – Use of Funds

- Continued Demonstration, De-risking and commercialisation of Keyseam technology
  - Continued operation of UCG Panel 2 and 5 MW power station
  - Rehabilitation of Panel 1
  - Engineering for commercial scale-up
- Chile
  - Continued technical support to demonstrate transportability of Keyseam
- Wyoming, USA
  - Planning & approvals for exploration



# Key Partnerships

 	Australian listed, International Fertiliser and Explosives Manufacturer	Extensive experience in downstream ammonia production, plant design and project delivery
 <p>GRUPO ANTOFAGASTA MINERALS</p>	Chilean based, International Copper Mining Company listed London Stock exchange	Coal resource owner with local expertise and networks. Significant human resources and mining capabilities
 <p>ARCADIA ENERGY TRADING</p>	Australian-based subsidiary of Farahead Holdings Group (incl. Golar LNG Ltd, Arcadia Petroleum Limited, Frontline Limited and Seadrill.)	International energy trading experience
 <p>H-EMA ENDÜSTRİ A.Ş.</p>	A Turkish construction, transport and mining corporation.	Vast coal rights in Turkey
 <p>ADANI</p>	Major Indian Corporation with interests in power generation, coal mining and trading.	Largest trader of imported coal in India with over 50% market share, and is currently developing a coal tenements in Australia



# Resources

## Transforming Stranded Coal into Valuable Product Gas

Project	Commercial Target <sup>1</sup> (million tonnes)	JORC Resource <sup>2</sup> (million tonnes)	Recoverable Gas <sup>3</sup> (PJ)
Queensland, Australia		668	6,680
Mulpun, Chile <sup>4</sup>		103	1,100
Wyoming, United States	500	In 2012	5,000
<b>Total</b>	<b>500</b>	<b>771</b>	<b>12,780</b>

### Notes

1. Carbon Energy target
2. JORC compliant – Competent Person: Dr C. Mallett
3. Carbon Energy calculation based on estimated energy content of the coal and 50% recovery (that takes into account pillars, losses and a gasification efficiency of 80%)
4. Carbon Energy has the right to a 30% contributing interest in the Chile deposit upon completion of agreed milestones



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# Resource Reserves

## Positions & Possibilities

Company	3P Reserves (QLD) vs Recoverable UCG Syngas (PJ)
APLNG (Origin/ConocoPhillips)	15,561
QCLNG (BG led JV)	9,804
Shell LNG (Shell/PetroChina)	10,380
GLNG (Santos led JV)	7,720
Carbon Energy (all projects)	12,780



# Resource

## Assessment Criteria

Criteria	Description
Coal resource	Suitable for Carbon Energy's UCG technology
Location	Close to markets or close to infrastructure to access markets
Market	Market demand for UCG syngas products (e.g. power, chemicals, liquid fuels) at attractive prices Revenues and profits can be repatriated to Australia
Regulation	A regulatory pathway for UCG projects
Counterparty	A strong counterparty that brings additional capability to projects (e.g., coal resources, capital, access to markets)
Commercial Terms	Carbon Energy earns an equity interest in the resource Carbon Energy's Intellectual Property is protected Fair and equitable value to each party Little or no restriction to Carbon Energy's other interests
Sovereign Risk	Separation of executive and legal Ability to repatriate profits Strong environment and safety standards



## keyseam<sup>®</sup> Low cost, low emission and low impact technology

Carbon Energy's **keyseam<sup>®</sup>** technology transforms stranded coal into high-quality gas, providing our market advantage.

*keyseam<sup>®</sup> creates a low-cost, low-emission and low-impact pathway for delivering a new generation of commercial scale energy projects through more efficient, cleaner utilisation of deep coal resources; unlocking a previously inaccessible energy source with a minimal environmental footprint.*

Site selection and panel design using advanced geological modeling and an unrivalled understanding of ground behavior following on from 10 years of research and development by the CSIRO – Australia's leading research agency

3 years of trials in readiness for commercialization

**keyseam<sup>®</sup>** the key to unlocking value



**keyseam<sup>®</sup>**



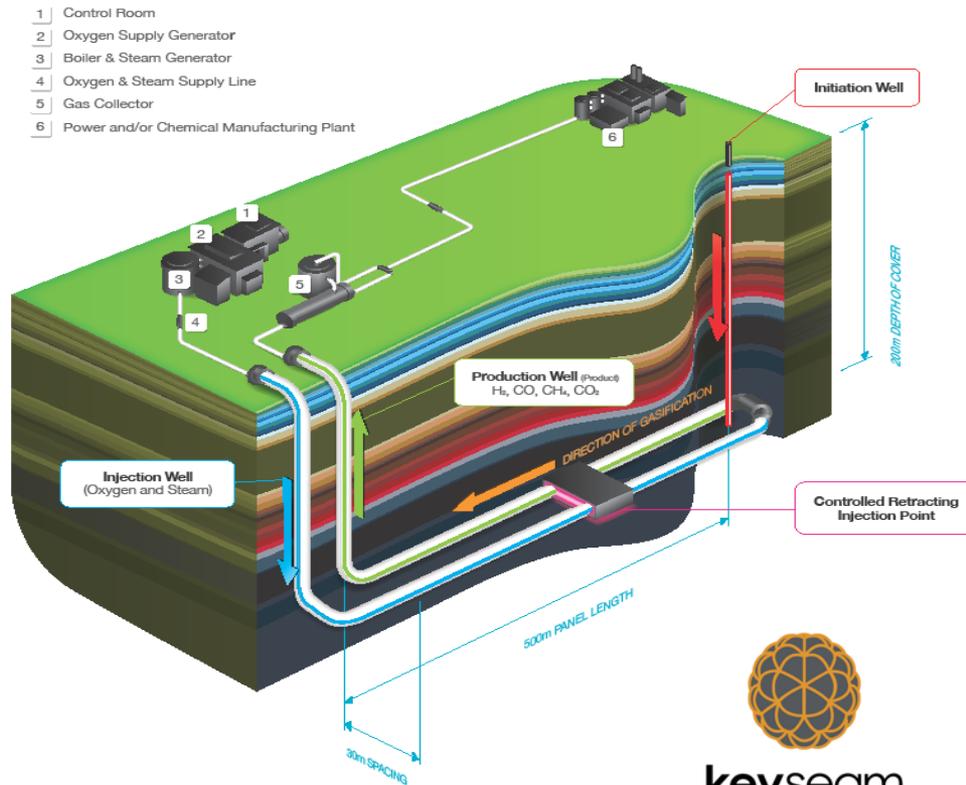
# keyseam<sup>®</sup> Unlocking a previously inaccessible energy source

Controlled  
in-panel  
reaction

Utilising  
deep coal

Produces  
energy-rich  
Gas (syngas)

Leaves rock  
ash in-situ



Cuts carbon  
emissions

Minimizes  
surface  
disturbance

20 times  
more energy  
vs. CSG

Preserves  
groundwater





# keyseam<sup>®</sup> Producing energy with a lower environmental impact

## 6 Significant Environmental Advantages of keyseam<sup>®</sup>

1. **Maximises resource efficiency** by extracting 20 times more energy from the same resource when compared to Coal Bed Methane (CBM) production.
2. **Minimises surface disturbance** by extracting the energy from coal through a series of boreholes rather than mechanical excavation used in conventional mining methods.
3. **Preserves groundwater quality** by operating the gasification process below the hydrostatic pressure and not pumping groundwater to the surface. Maintaining the surrounding groundwater pressure acts as containment for the gasification process and ensures that syngas flows to the surface under pressure via the Production Well.
4. **Leaves rock and ash underground** in the coal bed, originally mixed with the coal.
5. **Cuts carbon emissions** by producing syngas-fuelled electricity with 10-20% less CO<sub>2</sub> emissions than traditional coal-fired power plants whilst reducing the cost of carbon capture.
6. **No fracking process or chemicals.**





# UCG vs. CBM

	<b>Underground Coal Gasification (UCG)</b>	<b>Coal Bed Methane (CBM)</b>
<b>Energy Source</b>	Coal	Gas in coal
<b>Process</b>	Gasification	Extraction of water
<b>Product</b>	Syngas (hydrogen, methane & carbon monoxide)	Methane
<b>Energy Recovery</b>	About 85% of the energy in coal	About 5% of the energy in coal
<b>Waste Water</b>	Relatively small quantities of water	Large quantities of water
<b>Water Treatment Process Produces</b>	Clean water and CO <sub>2</sub>	Clean water and low volumes of hyper-saline water (brine)

*Source: Industry sources and Madison Williams and Company*



## Markets - What are the global opportunities ?

- **UCG offers a bridge to sustainable energy**
- Energy demand is increasing worldwide and energy security will continue to be of increasing importance.
- The International Energy Agency forecast that coal will maintain its position as the leading source of power generation globally for at least the next 25 years.
- The World Energy Council\* estimates UCG could potentially increase recoverable global coal reserves by as much as 600 billion tonnes.

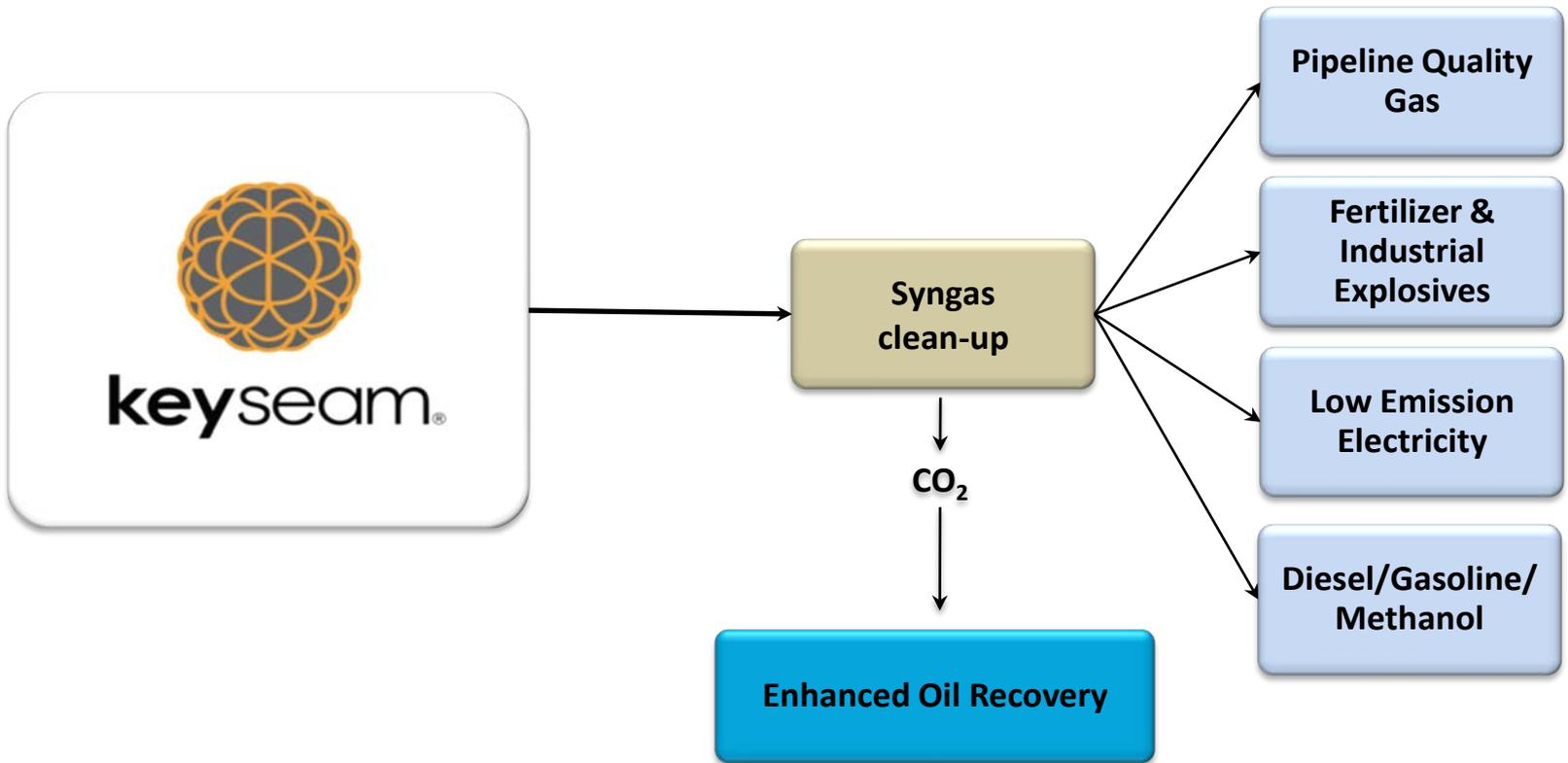


*UCG has scale and cost base to be 10% of global energy supply*

\* 2007 Survey of Energy Resources

\* AUSTOCK Securities, *Sustainable Energy – Tangible Solutions will prevail over International Regulatory Uncertainty*, July 2011

# Markets - Syngas & CO<sub>2</sub> Product Opportunities





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# Current Projects





# Queensland, Australia

## The Development of Australia's first commercial syngas-fuelled power station

Exploration Permits for Coal over 2,000 km<sup>2</sup>

668 Million tonnes (450 Million tonnes Inferred and 218 Million tonnes Indicated with 2 metre cut-off) of JORC compliant coal resource

### Short-term commercialization

- Power Generation into National Electricity Market
- Synthetic Natural Gas

### Medium-term commercialization

- Chemicals (e.g. ammonia)
- Liquid fuels





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# Chile – Mulpun Project

A market highly dependant on imported fuel with spot electricity prices up to \$220 per MWh

- **103 Million Tonne JORC Resource**  
(Measured: 26 Million Tonnes, Indicated: 37 Million Tonnes, Inferred: 40 Million Tonnes with a 2 metre thickness cut-off)
- Agreement with Antofagasta Minerals S.A. to jointly assess and develop a coal deposit in Mulpun (near Valdivia)
- Located in southern central Chile, 800km south of Santiago
- Focusing on Power Generation
  - Chilean electricity demand growing by 8% annually
  - Currently reliant on imported coal, LNG and Diesel

## Key Phase 1 Deliverables Achieved

- Hydrological Model development
- Site selection for the Pilot Project
- Environmental Approval for the Pilot Project

Site works for the first UCG Panel in Chile are progressing well and water monitoring wells are currently being drilled.





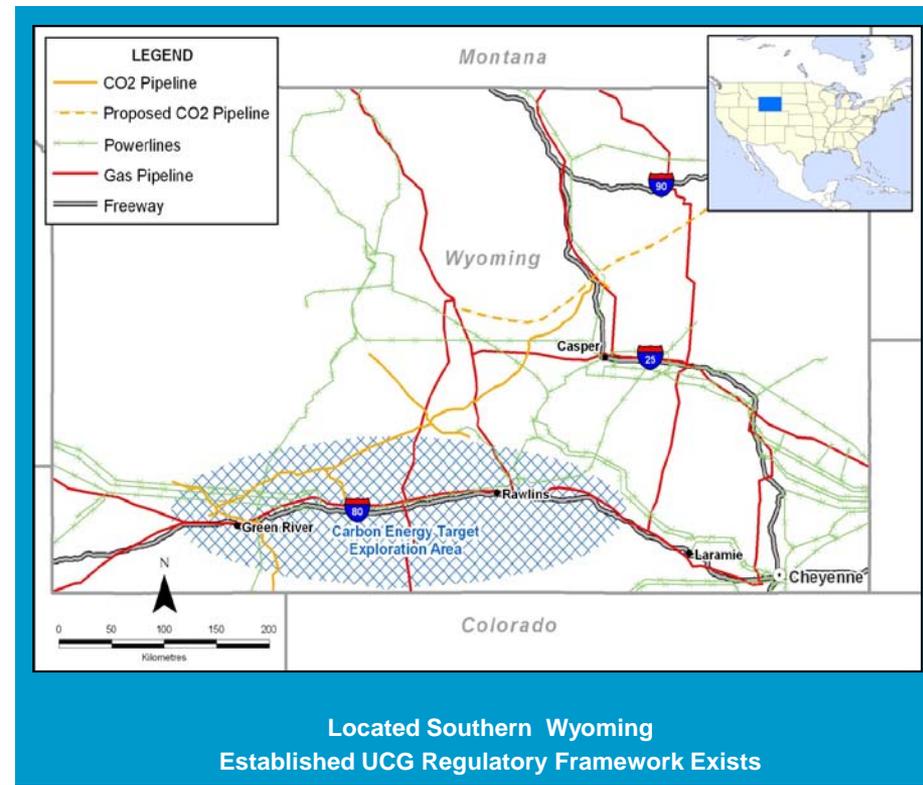
# United States – Wyoming & Montana / North Dakota

## Targeted drilling program to fast-track establishment of Inferred Resource

Wyoming Exploration Rights - 44mi<sup>2</sup> (113km<sup>2</sup>)

Montana/Nth Dakota Exploration Rights - 171mi<sup>2</sup> (276km<sup>2</sup>)

- Exploration License with Option to Lease Agreements
- Contract includes Off-Take Agreement for CO<sub>2</sub> for use in Enhanced Oil Recovery - generating additional revenue stream
- Key Development Milestone:
  - 500 Million Tonnes Inferred Coal Resource
  - 100 Million Tonnes Indicated Coal Resource
- Planned production of electricity, synthetic natural gas (SNG) and CO<sub>2</sub> for Enhanced Oil Recovery (EOR)
- 500 million tonnes of coal resource can support gas production of 5,000PJ which can generate \$1,800 million each year for 15 years (@\$5.50/GJ)
- Sites located close to existing infrastructure – natural gas, electricity and CO<sub>2</sub> pipelines



Located Across Montana and North Dakota Border  
UCG Regulatory Framework currently under evaluation by Montana State Government.

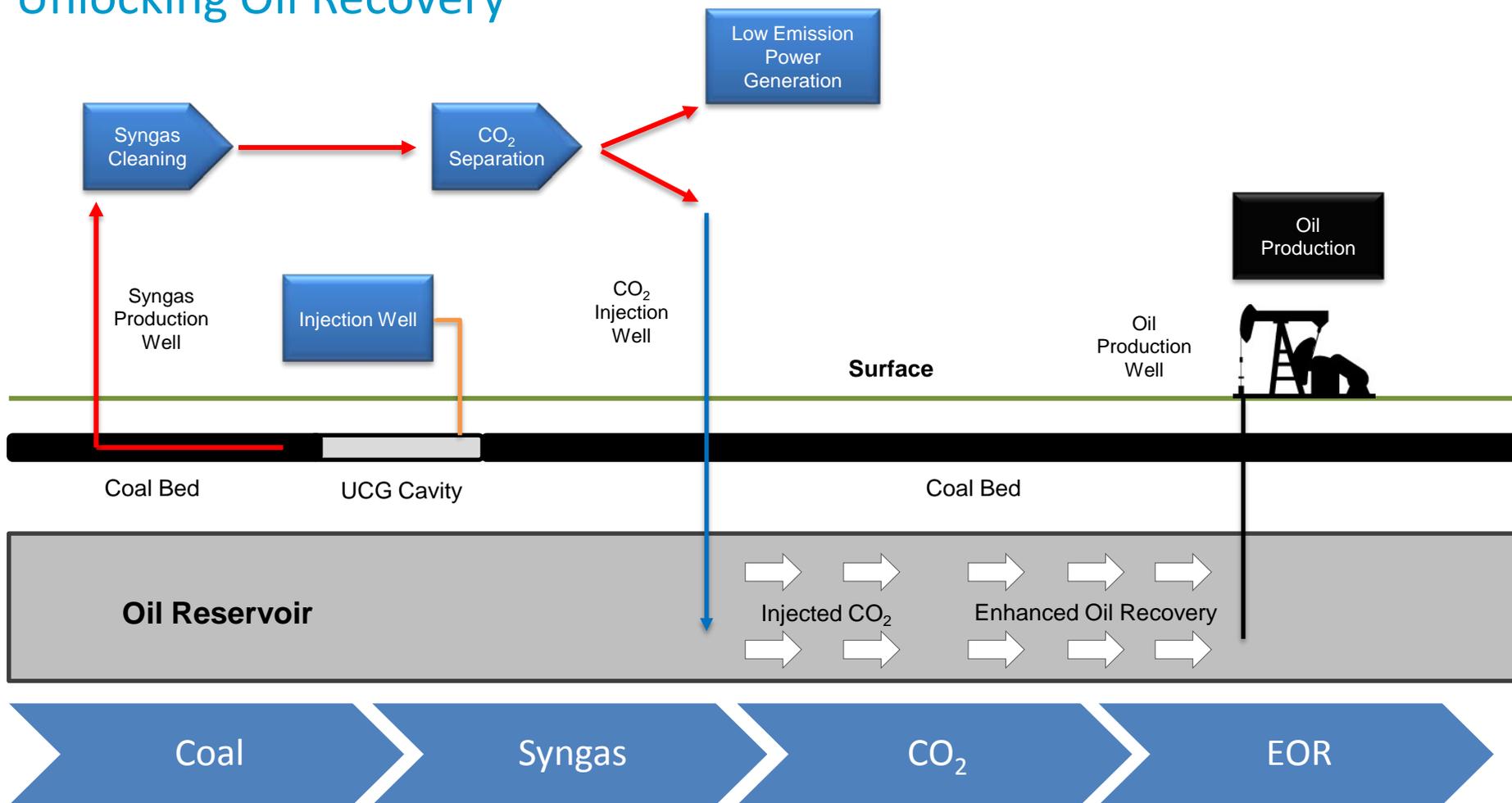
\* Sources: NYMEX, FERC, AEMO and Carbon Energy analysis



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## Unlocking Oil Recovery





# Turkey – Amasra

50/50 JV with Hema Endustri, one of the 17 companies in the diversified Hattat Group, one of Turkey's leading companies.

- Government approval for UCG Pilot
- Pilot planning commenced
- Key Development Milestone: 500 Million Tonnes Inferred Resource
- Planned production of lower-emission power and synthetic natural gas (SNG)
- Attractive Power and Gas Prices\*USD\$70/MWh and USD\$7.30/GJ
- Turkey is one of the fastest growing economies in Europe but imports about 70% of its energy needs



**Located on Northern Turkish Coast**  
**Government approval for UCG pilot in place**

*Close to existing infrastructure and mining operations*

\* Sources: TETAS, BOTAS Turkish State Owned Petroleum and Pipeline Corporation



# Summary

## Resource

- Established Resource in Australia & Chile
- Exploration planning in Wyoming, USA

## Technology - keyseam<sup>®</sup>

- 3 Years Operational Experience in Australia
- Panel 2 Performance Exceeding Expectation
- Ongoing demonstration, de-risking and up-scaling

## Markets

- Proof of concept at 5 MW scale in Australia
- Acceleration of commercialisation in Chile
- Discussions commenced for Wyoming Off-take



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# Thank You

## Carbon Energy

*Low-cost, low-emission energy has arrived*

Andrew Dash Managing Director



# Appendix

## Unit Conversions

1 GJ = 0.95 Million Btu  
1 PJ = 1,000,000 GJ  
1 boe = 42 Gallons (159 litres)  
= 5.8 Million Btu  
= 6.1 GJ

10,000 boe/day = 61,000 GJ/day  
= 22.3 PJ per annum

100 Million Tonnes = 1,000 PJ recoverable gas  
= 20 PJ per annum for 50 years  
= \$110 Million per annum @ \$5.50/GJ