

2010  
2011

**CARBON ENERGY**  
**ANNUAL**  
**REPORT**

A world leader in  
advanced coal technology



**carbonenergy**  
resource. technology. markets.



# CARBON ENERGY IS A WORLD LEADER IN ADVANCED COAL TECHNOLOGY

In three short years we have turned our proprietary **keyseam**<sup>®</sup> technology into a commercial reality and delivered an Australian first in power generation by syngas.

We have built a portfolio of coal assets ready to supply markets desperate for new fuel sources and partnered with world leading organisations across Australia, Chile, Turkey and the United States.

We have established a strong foundation. Now we are ready to power a new generation in advanced coal technology.



**SUNSET AT  
BLOODWOOD CREEK  
PROJECT SITE**



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# CARBON ENERGY IS A WORLD LEADER IN ADVANCED COAL TECHNOLOGY

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

## RESOURCE

### STRANDED COAL RESOURCES

Build a targeted international portfolio of coal assets suitable for Underground Coal Gasification (UCG)



# STRATEGIC OBJECTIVES

## TECHNOLOGY

TRANSFORMED  
INTO SYNGAS

Be a leader in advanced coal technology that delivers a lower cost, lower emission fuel source.



keyseam®

## MARKETS

DOWNSTREAM  
PRODUCT MARKETS

Supply UCG Syngas to high-value downstream markets.



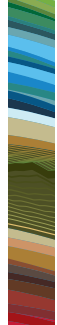
# 2011 CONTENTS

## MORNING MIST ACROSS BLOODWOOD CREEK



All images featured are taken from Carbon Energy sites around the world.

Chairman's Report .....	8	FINANCIAL REPORT	
CEO & Managing Director's Message .....	10	Consolidated Statement of Comprehensive Income .....	45
Highlights FY2011 .....	12	Consolidated Statement of Financial Position .....	46
		Consolidated Statement of Changes in Equity .....	47
Australia – Bloodwood Creek, Queensland .....	13	Cash Flow Statement .....	48
South America – Mulpun, Chile .....	16	Notes to the Financial Statements .....	49
International Expansion .....	18	Directors' Declaration .....	85
North America – Wyoming .....	19	Independent Audit Report .....	86
North America – Montana-North Dakota .....	20	Tenement Schedule .....	88
Europe – Amasra, Turkey .....	21	Shareholder Information .....	89
Executive Management .....	22	Corporate Information .....	91
DIRECTORS' REPORT			
Board Information .....	24		
Information on Directors and Company Secretary .....	27		
Remuneration Report (Audited) .....	30		
Auditor's Independence Declaration .....	37		
CORPORATE GOVERNANCE STATEMENT .....	38		



# RESOURCE

“The World Energy Council estimates UCG could potentially increase recoverable global coal reserves by as much as 600 billion tonnes.”\*

\* 2007 Survey of Energy Resources

## We transform stranded coal resources into valuable product gas

Core to what we do is transform otherwise stranded coal resources into high value fuels. Identification and selection of resources suitable for our keyseam technology is essential to our strategy. We are building a targeted international portfolio of coal assets that meet our key resource assessment criteria.

## Our current resource targets

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	By Dec 12	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

## Our key assessment criteria for selecting resource projects

Criteria	Description
Coal resource	Suitable for keyseam.
Location	Close to routes to 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).
Sovereign Risk	Clear legal framework to protect commercial interests. Ability to repatriate profits to Australia. Strong environment and safety standards.

# TECHNOLOGY

**keyseam** creates a low-cost, low-emission and low-impact pathway for delivering a new generation of commercial scale energy projects. Its more efficient, cleaner utilisation of deep coal resources unlocks a previously inaccessible energy source with minimal environmental footprint.

## keyseam

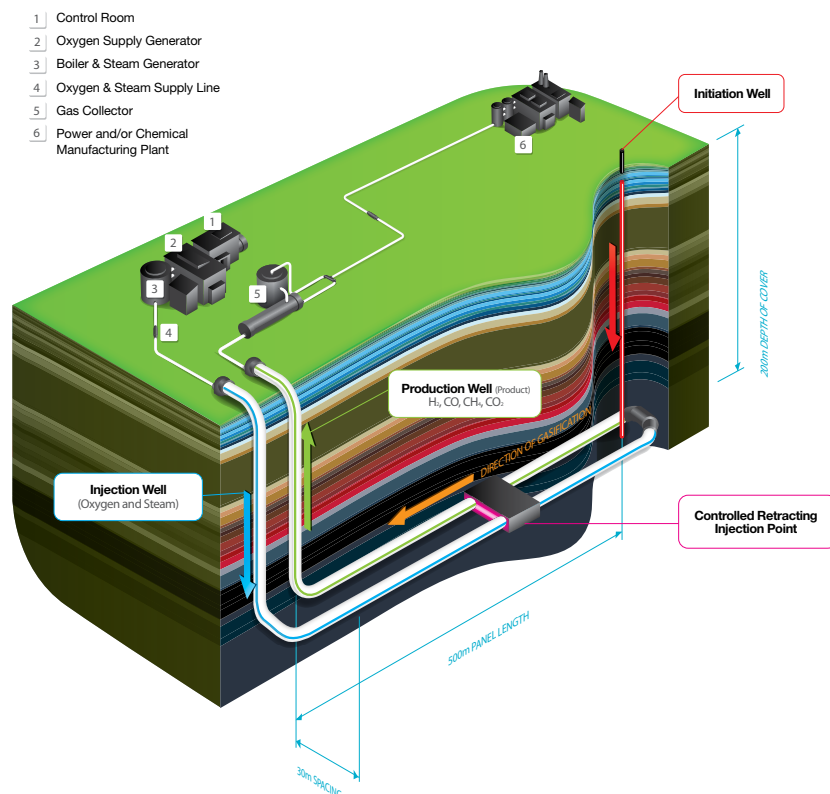
Carbon Energy's competitive advantage lies in its intellectual property and proprietary technology, **keyseam**, which transforms in-situ coal into gas underground and optimises the amount of energy extracted from otherwise stranded coal resources.

**keyseam** is an innovation in underground coal gasification (UCG), incorporating a unique criteria for site selection and advanced geological modelling. It also maximises resource efficiency, extracting up to 20 times more energy than the coal seam gas (coal bed methane) process from a given resource, whilst minimising surface disturbance and preserving groundwater.

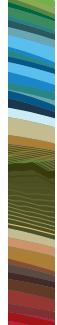
**keyseam**'s advantage comes from Carbon Energy's long association with Australia's premier research agency, the Commonwealth Scientific Industrial Research Organisation (CSIRO), which includes world-class geotechnical, hydrological and gasification modelling capabilities.

## Six significant environmental advantages of **keyseam**

1. Maximises resource efficiency by extracting up to 20 times more energy from the same resource when compared to coal seam gas (coal bed methane) 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 by operating the gasification process below the hydrostatic pressure and not pumping groundwater to the surface.
4. Leaves rock and ash, originally mixed with the coal, underground in the coal seam.
5. Cuts carbon emissions by producing syngas-fuelled electricity with 10-20% less CO<sub>2</sub> emissions than traditional coal-fired power plants.
6. Does not involve fracking.







# MARKETS

“UCG has scale and cost base to be 10% of global energy supply.”\*

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

Our valuable product gas syngas can be used in the production of high value commodities such as electricity, pipeline quality gas, fertilisers, and liquid fuels. We have the flexibility to deploy our technology and supply syngas to a range of downstream industrial customers depending on local market requirements wherever we are in the world.

An additional revenue stream can also be generated by separating the by-product carbon dioxide (CO<sub>2</sub>) from our syngas for use downstream in Enhanced Oil Recovery, a technique used to increase the productive life of mature oil fields which has been demonstrated at a commercial scale for more than 30 years in the USA.

