



Scottish Oil Club European CBM

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Composite Energy

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- Global overview
- Formation & Production of CBM
- Composite business model
- Critical success factors
- Carbon storage in coal

CBM – World Resources ~960Tcf

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Source: Wood Mackenzie "Unconventional Hydrocarbons" Dec 2006

GLOBAL OVERVIEW: International CBM Activity

USA

- Mature business – 5bcf/day production
- Commercial production started modestly in 1981 and by 2000 there were 14,000 wells producing 4.5bcf/day
- 600 companies working in San Juan basin
- In Jan 2007 BP announced \$2.4billion investment



Canada/Alaska

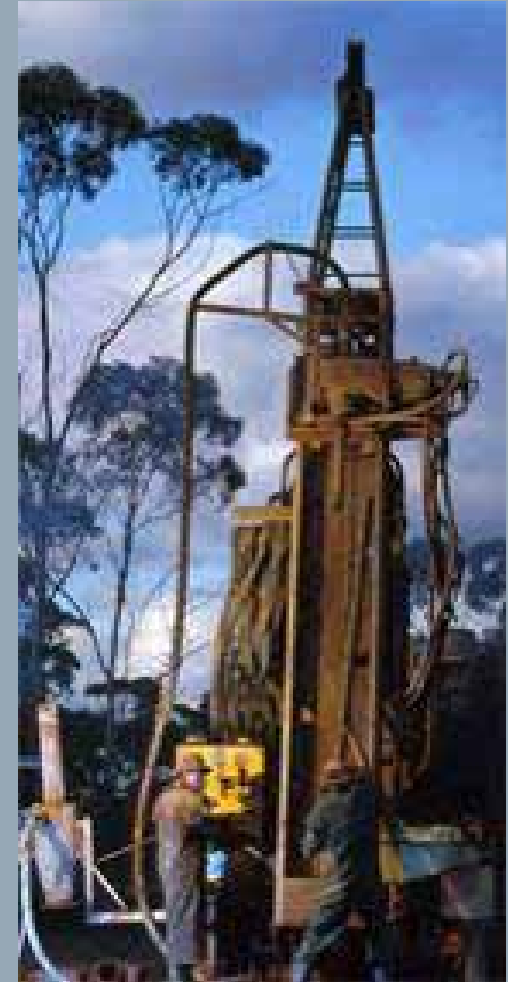
- High growth area – current production ~ 450mmscf/day
- Target is 15% of domestic demand



GLOBAL OVERVIEW: International CBM Activity

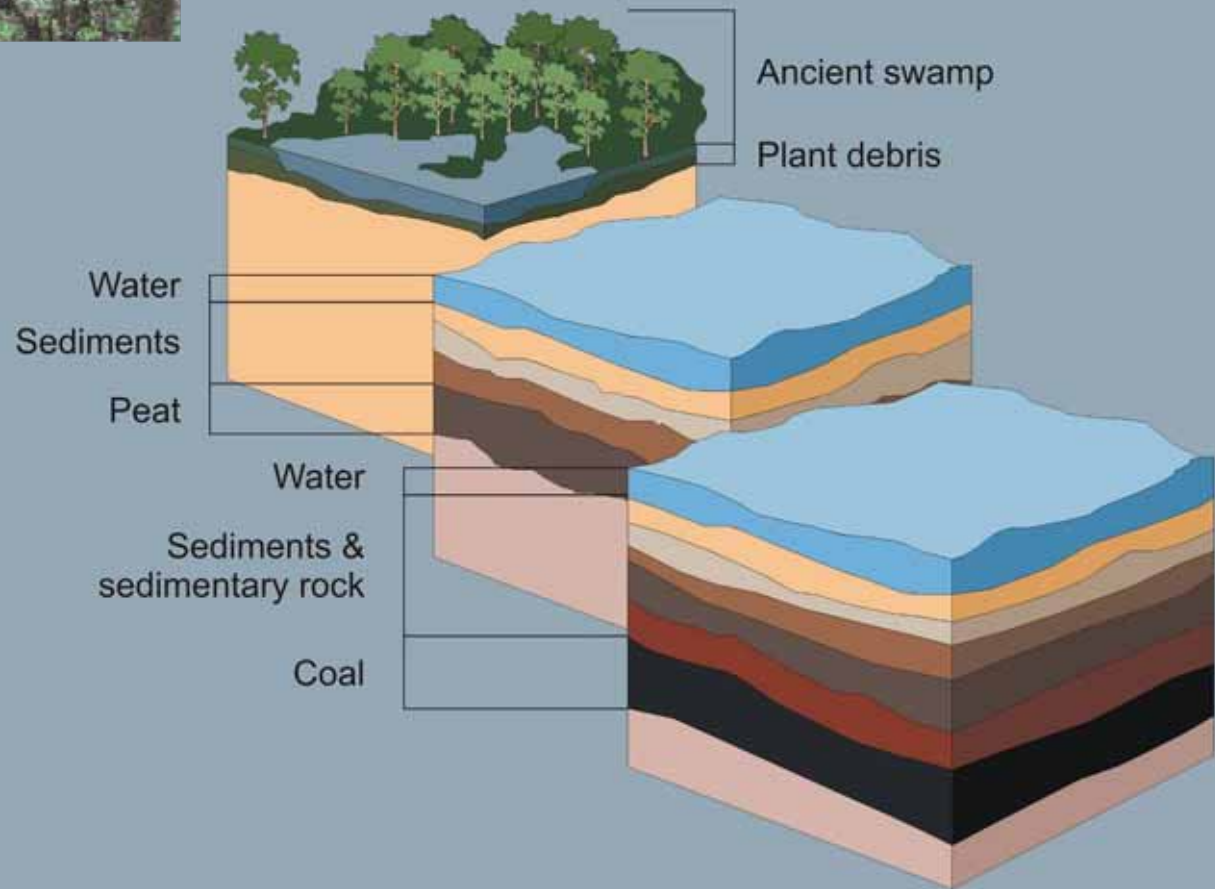
Australia

- Most active development of unconventional gas, outside of North America.
- Estimate of 5 to 7 Tcf of proved CBM reserves in Queensland (with 25 Tcf ultimately recoverable).
- Santos purchased CBM and other assets of Tipperary Corp for \$600 million in 2005.
- BG Purchase of QGC 2008
- BG Purchase of Pure Energy 2009
- Shell investment in Arrow 2008



Formation of Coal – Original Environment

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Formation and Quality of Coals



Peat



Lignite



Bituminous



Anthracite



Methane in coal is:

- Adsorbed on the surfaces of the coal
- Stored as free gas in the cleats and open pores

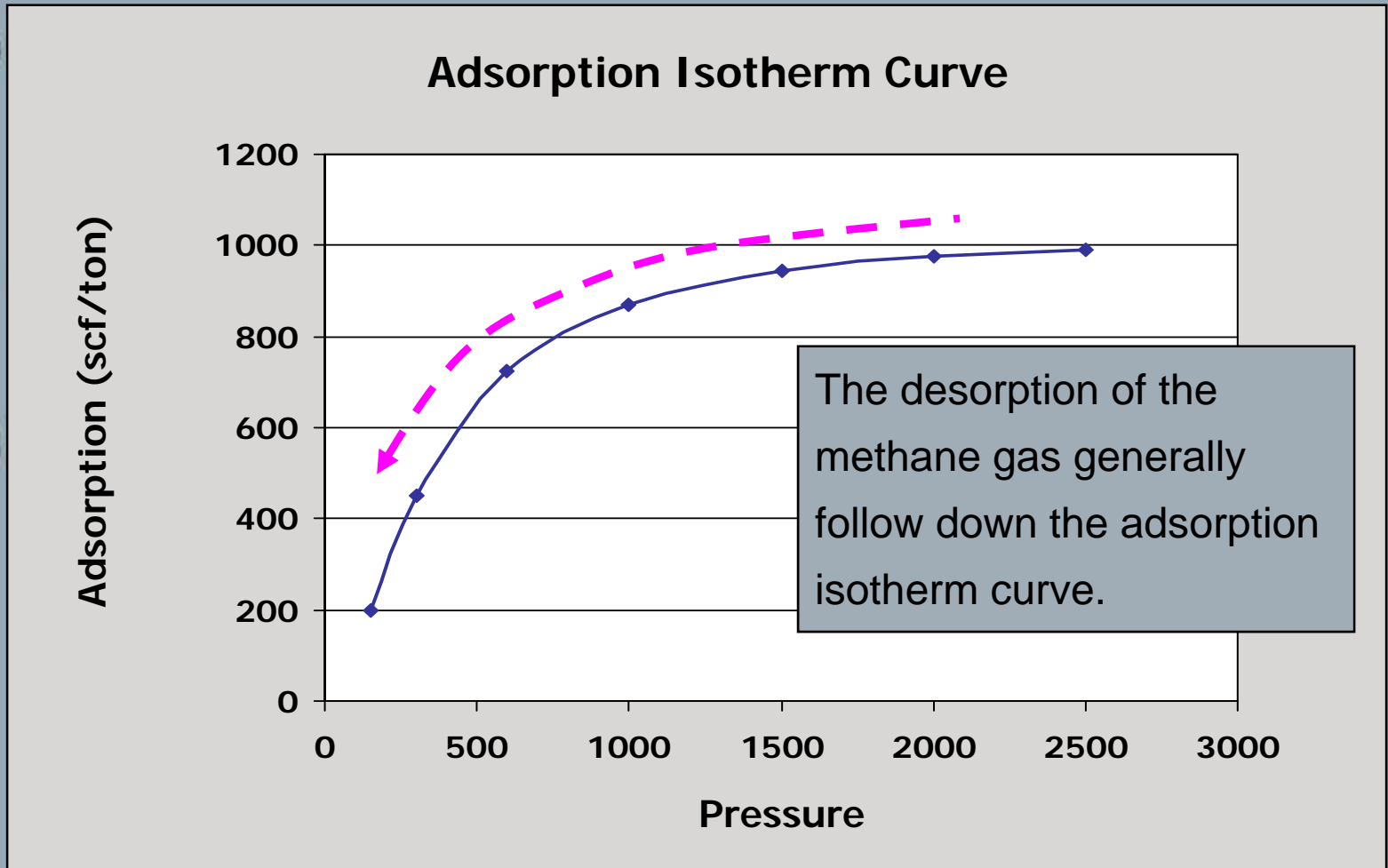


aDsorption = Carbon Filters

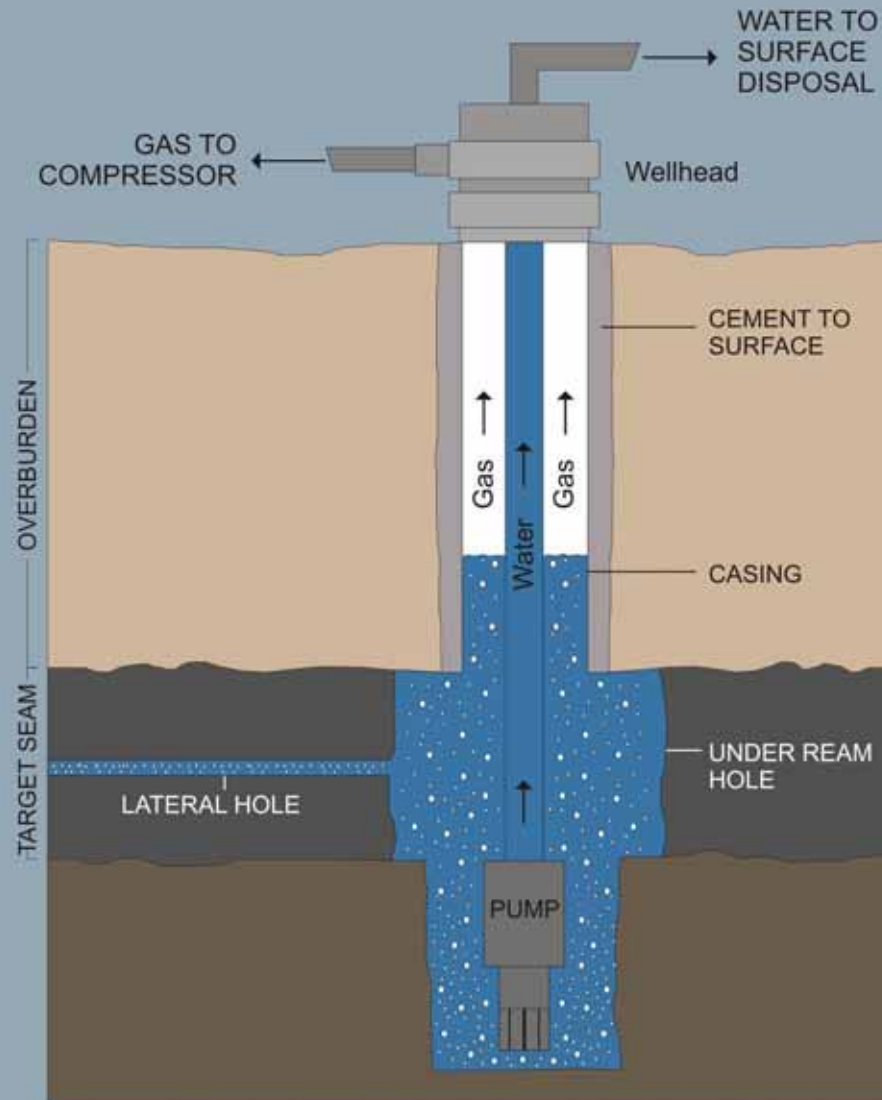
aBsorption = Sponges

COAL BED METHANE

Methane Desorption Curve



Typical Simple Vertical Well

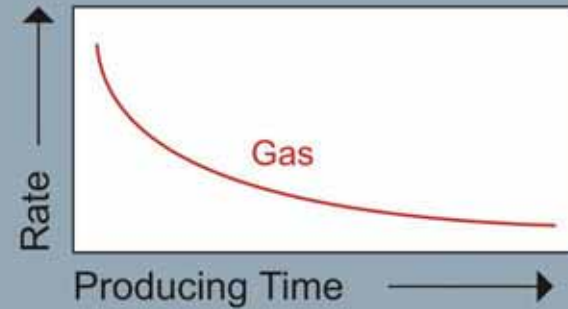
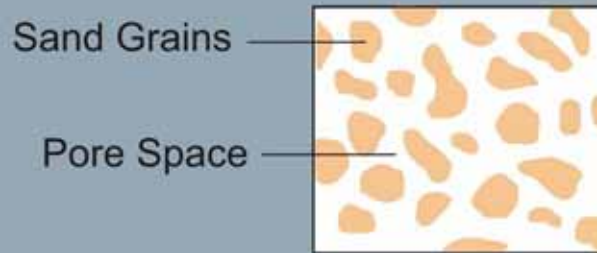


COAL BED METHANE

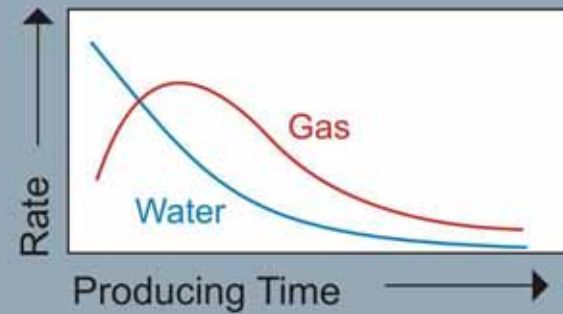
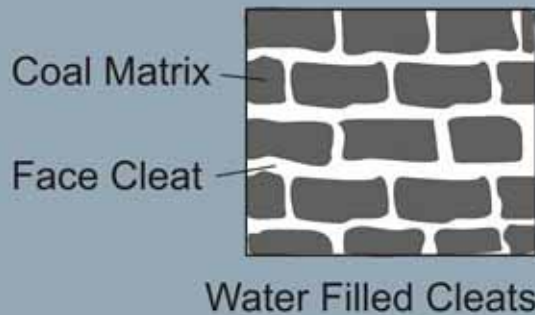
Different to Conventional Reservoirs



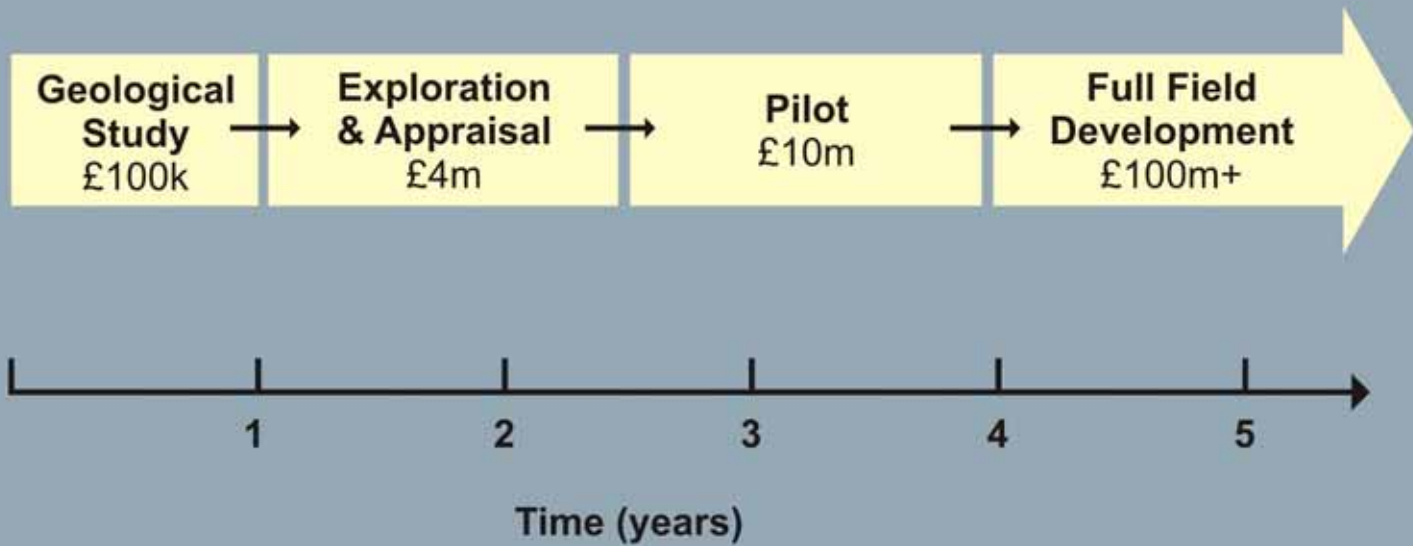
Conventional Gas



Coal Bed Methane

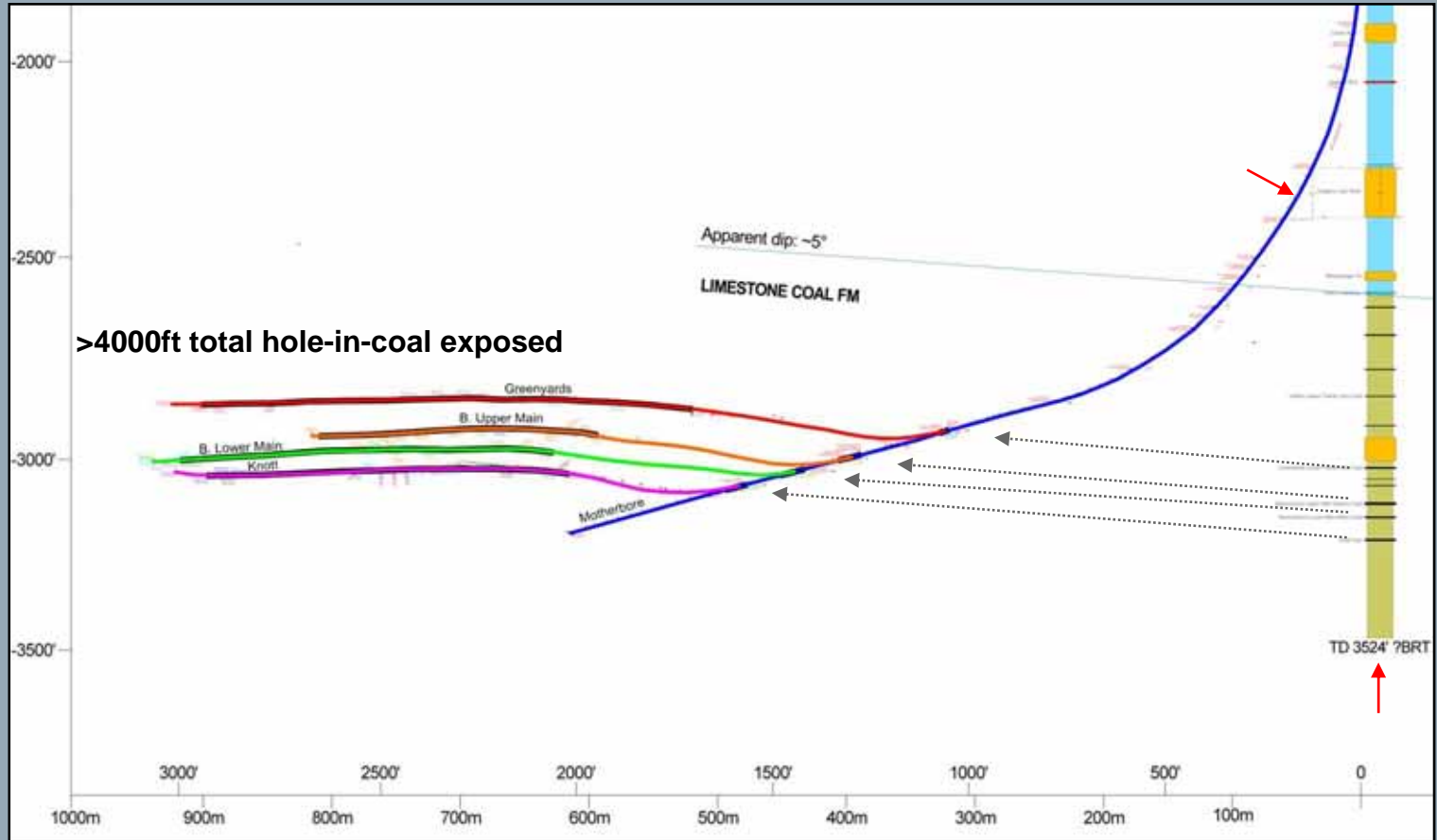


CBM Development Process





Pilot Well Drilling Techniques #2

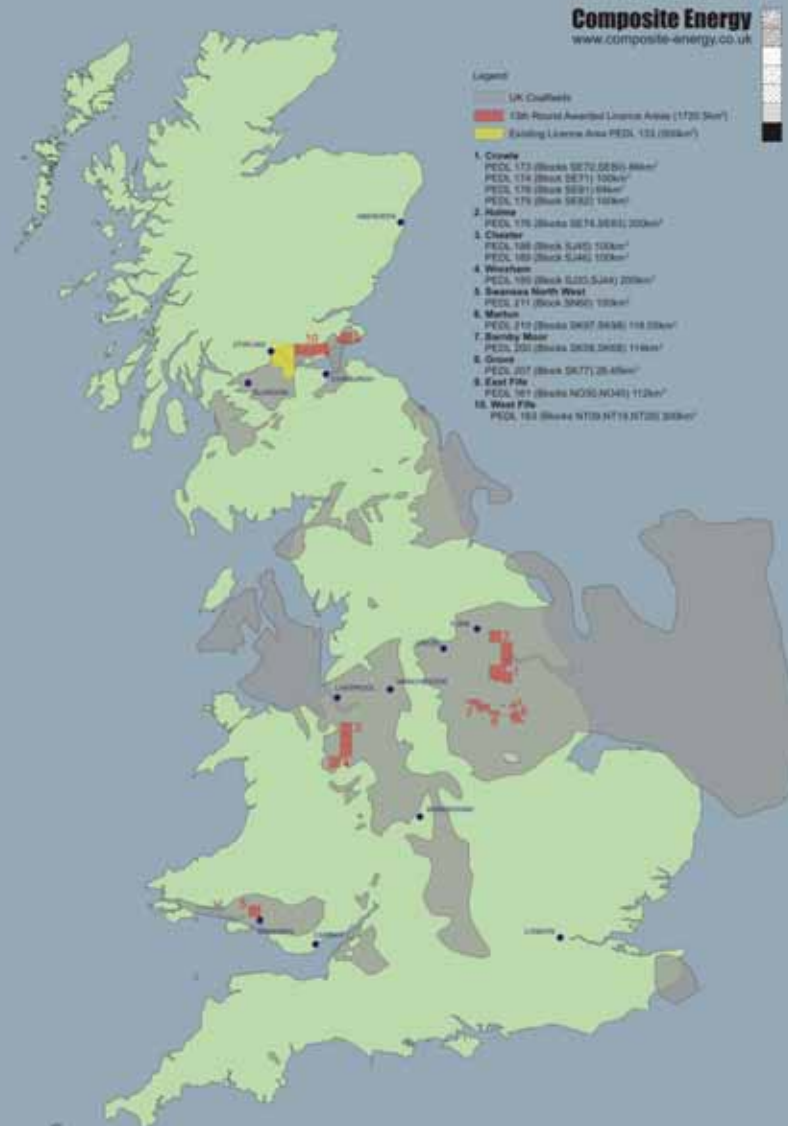


CBM is material resource and requires scalable low-cost operations

- Build a large asset portfolio
 - 3500 Sq Km's gross acreage in UK & Poland (multi-tcf resource)

- Build low-cost operator capability
 - 80 staff
 - 3 drilling rigs owned and operated
 - Developing non E&P service providers

- Build partnerships capable of delivering material resource
 - BG Group co-venturer in 100% of portfolio
 - Gas chain expertise and risk-capital



Legend

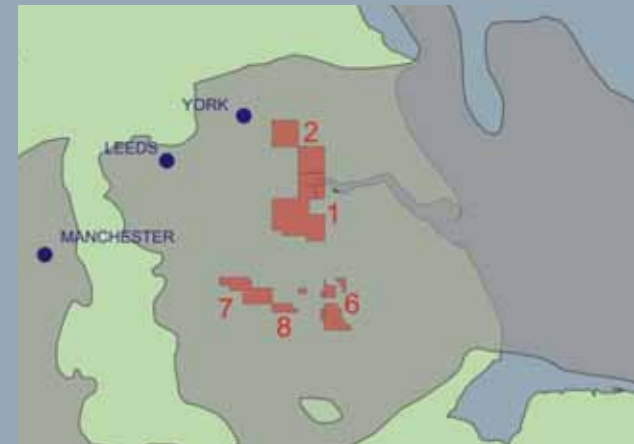
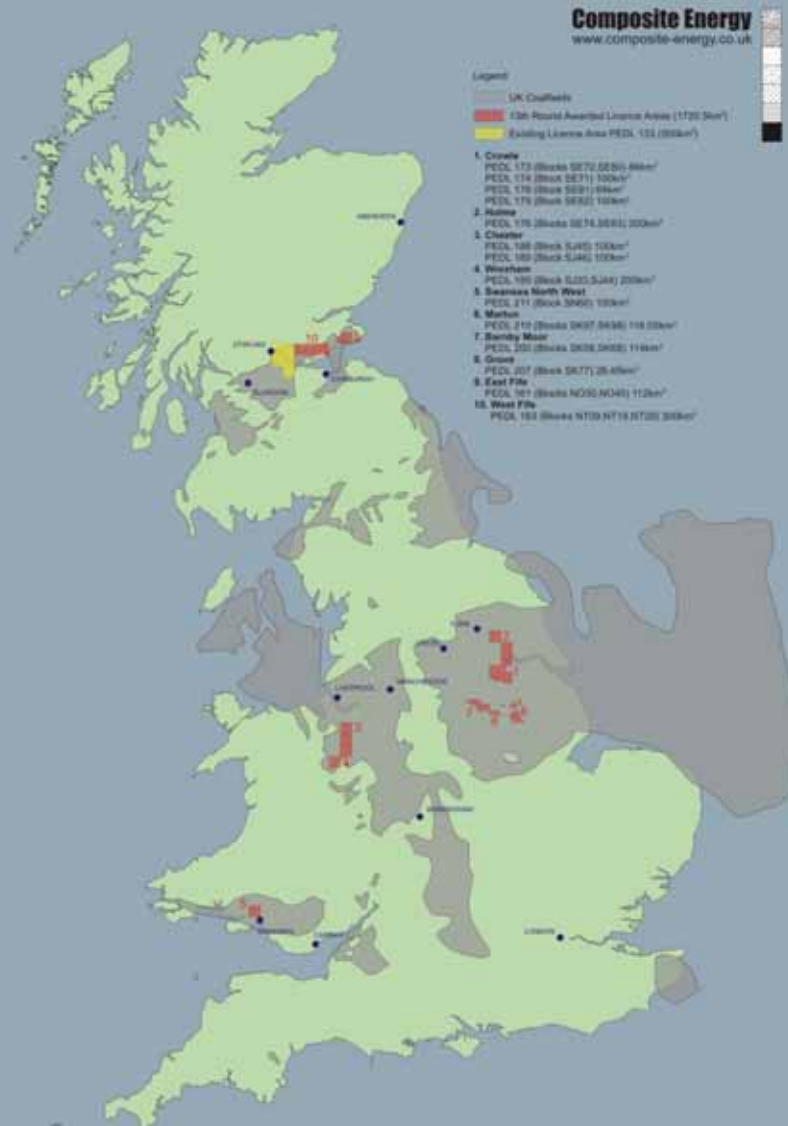
- UK Coalfields
- 13th Round Awarded Licence Areas (1720.5km²)
- Existing Licence Area PEDL 133 (500km²)

9. East Fife

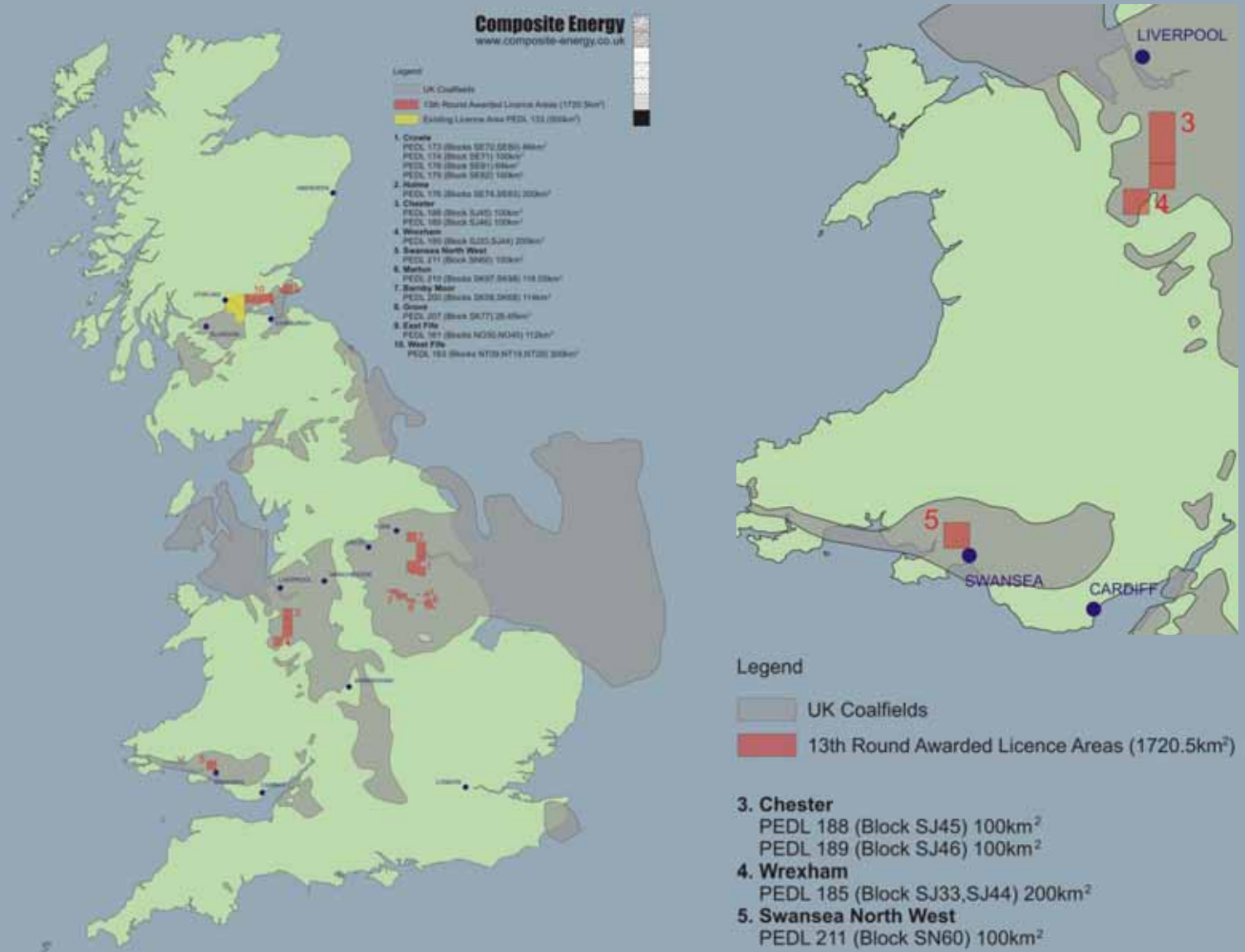
PEDL 161 (Blocks NO30,NO40) 112km²

10. West Fife

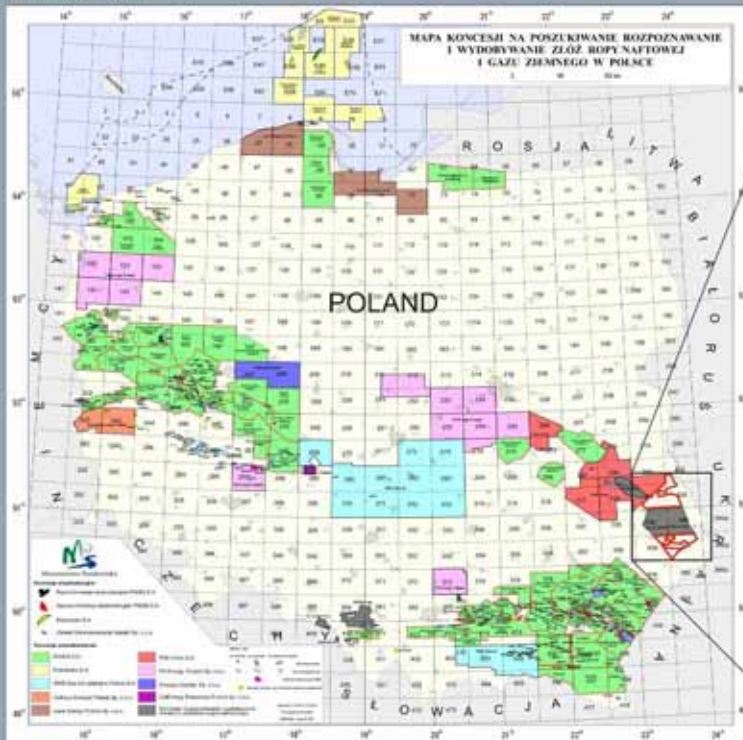
PEDL 163 (Blocks NT09,NT19,NT29) 300km²



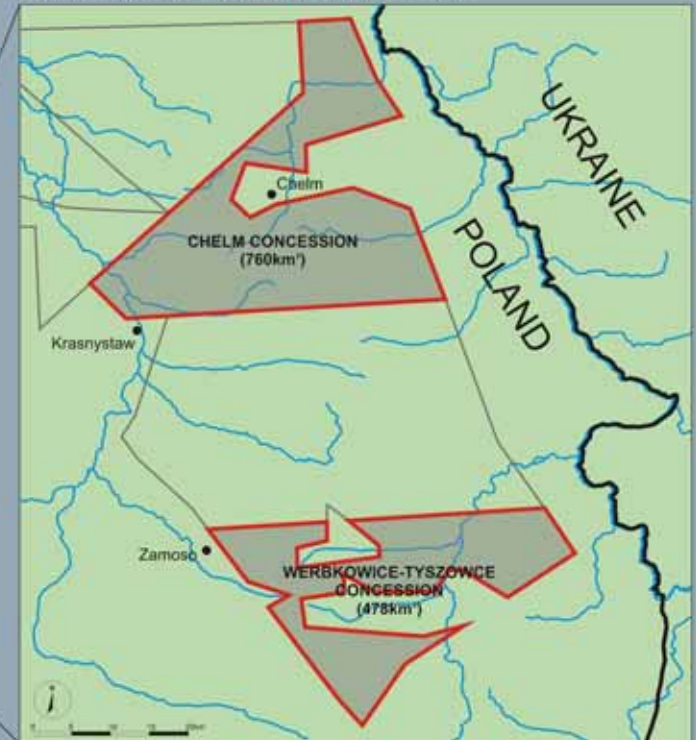
- Legend**
- UK Coalfields
 - 13th Round Awarded Licence Areas (1720.5km²)
- Crowle**
 - PEDL 173 (Blocks SE70,SE80) 86km²
 - PEDL 174 (Block SE71) 100km²
 - PEDL 178 (Block SE81) 64km²
 - PEDL 179 (Block SE82) 100km²
 - Holme**
 - PEDL 176 (Blocks SE74,SE83) 200km²
 - Marion**
 - PEDL 212 (Blocks SK97,SK98) 116.05km²
 - Barnby Moor**
 - PEDL 200 (Blocks SK58,SK68) 114km²
 - Grove**
 - PEDL 207 (Block SK77) 28.45km²



MAP OF POLAND



COMPOSITE ENERGY (POLAND) SP.Z O.O. CONCESSIONS



Chelm Concession: 760sqkm

Werbkowice Concession: 478sqkm

- **Stakeholder Management**
 - Land access
 - Planning consent
 - Water disposal
- **Gas market**
- **Well design**
- **Ability to execute**
 - Rig access
 - Skilled people
 - Continuous programmes
- **Manage costs**
 - Rig ownership
 - Mindset
- **Geology**
 - Portfolio





Custom-built rigs to balance technical and environmental performance

3 Rigs Owned

- Field Development Plan (FDP) approved by UK authorities for the first pilot development at Airth
- Completed the last of 6 multi-lateral production wells
- Water processing and outfall active
- Reviewing development options
- 7 wells pumping, with gas being flared
- Plan to commence electricity and gas connections in 2009 and 2010



- 1st Commercial Development in Central Belt
 - Prove Production Potential
 - Limited power off-take
 - Gas grid Connection
- Drill 23 Test Wells in UK & Poland within 2 Years
 - Identify next 2 or 3 pilot sites asap
- Develop drilling fleet and capabilities as core differentiator
- Develop material production portfolio in EU

CO₂ : The Coal Conundrum

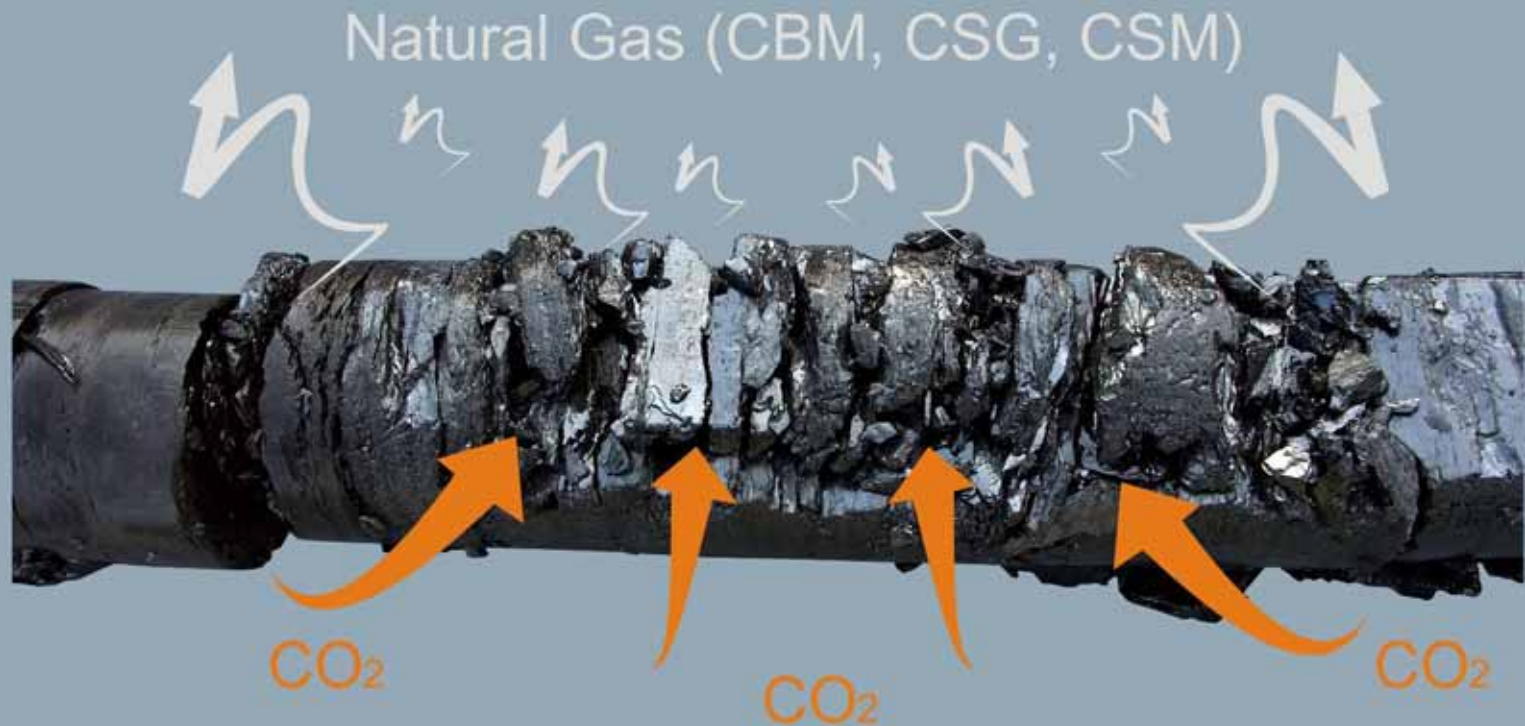


- 37% of UK Electricity *
- 57 million tonnes of coal
- 183 million tonnes of CO₂
- 33% of CO₂ emissions

BUT

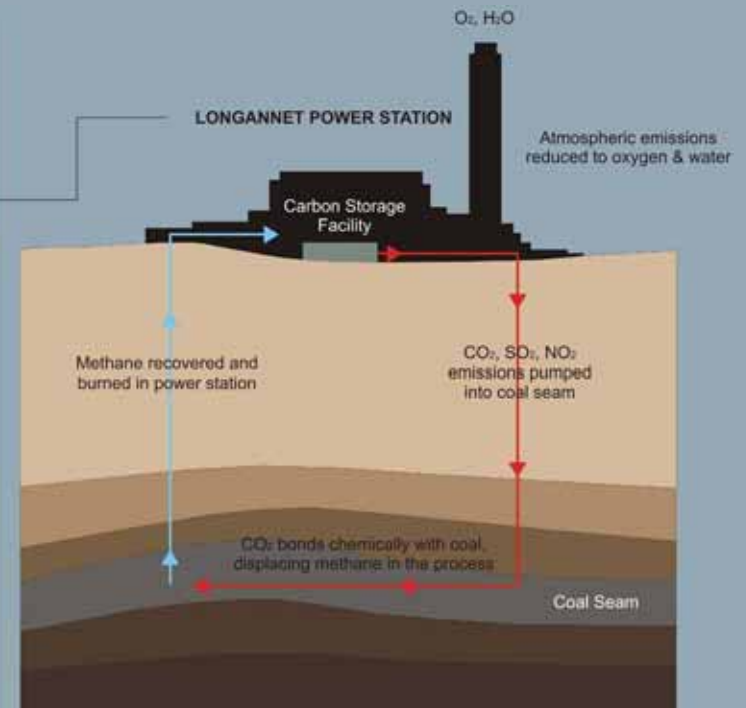
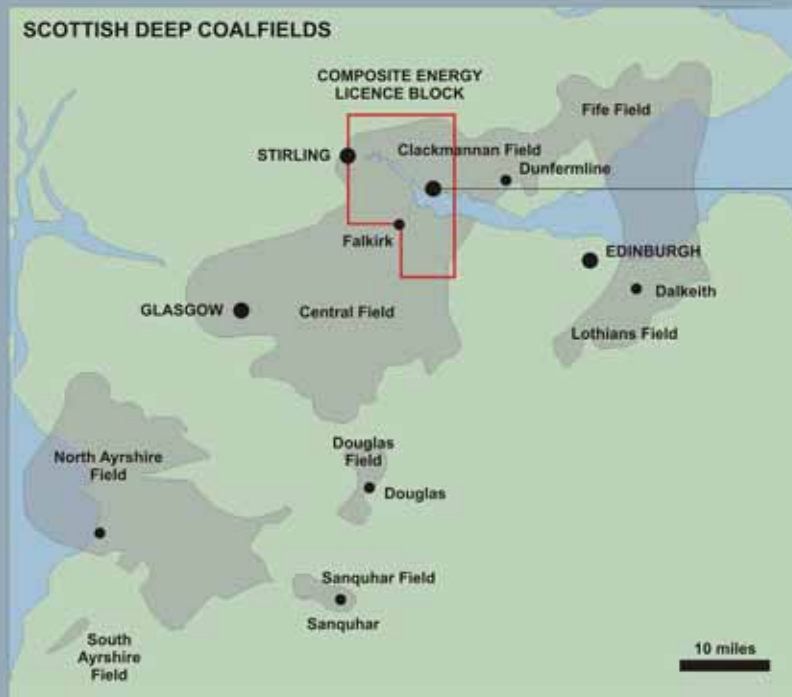
- Stations sit above deep coal (carbon store)





- Coal 'prefers' CO₂
- Coal stores 5x more CO₂ than Natural Gas
- Need to remove Methane first

- Select Committee 2006: “ Storage in coal seams may be small scale and local but..... R&D & technology may change this”
- CBM provides technology
- R&D project to test dynamics of injection & retention now complete
- Next Steps: Pilot Test, Funding & Licensing



- **Significant Long –Term Gas Production for the UK**
 - Diversity and security of gas supply
- **Requires scalable low-cost exploitation model**
- **Requires enough time and investment to open new basins**
- **Composite Energy and BG**
 - Addressing Technology Challenges
 - Designing Sustainable Development Model
 - Exporting CBM skills to Europe
 - R&D in to Carbon Storage Option

↳ ***Bringing pace to CBM exploitation***