



UK-US Workshop on
Collaboration in
Fossil Energy RTD
CO₂ capture technologies
24 May 2010

TSB AlgaeCAT project:
“Industrial CO₂ as a precursor
to sustainable biomass: reducing energy
consumption and CO₂ footprint”

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Overview

- Centre for Process Innovation
- Why CO₂ capture?
 - scale of the problem / scale of the opportunity
- TSB “AlgaeCAT” project
 - current versus proposed approach
- Future aspirations

From innovation to commercialisation

CPI (Centre for Process Innovation)

- located in North East England in the Tees Valley
- established 2004 by One North East; the regional development agency for the North East of England
- aims to stimulate and drive innovation within the UK process industry sector
- approximately 120 technical, commercial & administrative personnel
- skilled within biology, biochemistry, chemistry, materials science and process design & engineering
- turning inventions into working commercial processes
- linking academia with industry; creating partnerships that look to solve market failures

From innovation to commercialisation



Why CO₂ capture?

Annual global CO₂ emissions*:

- Steel 2.2 bill tonnes¹
- Aluminium 61 mill tonnes²
- Cement 2.3 bill tonnes³
- Lime 258 mill tonnes
- Power generation 1.5 bill tonnes (EU⁴)
15 bill tonnes (global)

*Calculated from industry product output data

¹ www.worldsteel.org 2008 data

² 2007 data

³ CEMBUREAU 2008 data

⁴ AEC greenhouse gas inventory 1990-2007 & 2009 (#4)

From innovation to commercialisation



Why CO₂ capture?

Scale of the commercial opportunity:

- value of global low carbon technologies market estimated at £700billion (US\$1trillion)
- carbon capture proportion £1.1billion (US\$1.6billion)
- estimated to almost triple to £3billion by 2030
- key growth sectors include China, India & US

From innovation to commercialisation



TSB “AlgaeCAT” project

Background

What?

- 3 year r & D project
- use of industrial CO₂ as a precursor to sustainable (algae) biomass
- reducing energy consumption and CO₂ footprint

Why?

- Environmental - UK target to reduce CO₂ emissions by 80% by 2050
- Commercial - DECC estimate CO₂ tariff of £25/tonne by 2020¹

Who?

- proposal addresses CO₂ capture from large scale point sources of CO₂ emissions
- consortium partners represent the energy intensive areas of power generation, process industries and metal production
- 50 mill tonnes per annum combined CO₂ output

¹Updated Energy & Carbon Emissions Projections, DECC URN 08/1358

From innovation to commercialisation



AlgaeCAT approach

- multiple technologies to be considered
 - traditional open pond as well as photobioreactor
- a TRL 4 - 6 development (r & D)
- utilise novel (background IP) algal growth module
- incorporate next generation lighting technology
 - including LED variants from PETEC and Polyphotonics Ltd
- IP generation / licencing arrangements
- prepare business case to secure further public and private funding

From innovation to commercialisation



Future aspirations

TSB AlgaeCAT project (1-3 years)

- R & D programme complete
- several algae based abatement solutions
- IP secured
- business model & additional funding in place

Project completion +2 years

- multiple commercial industrial solutions operational
- licencing fee revenue stream
- new application areas

Project completion +5 years

- funding secured to develop CO₂ & other markets eg AD to energy
- additional commercial industrial solutions operational

From innovation to commercialisation





Thank you for listening

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