

Innovation analogues – Realising the potential of CCS



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“Carbon Capture and Storage: Realising the Potential”

- Sussex, Imperial, Edinburgh and Cardiff
- Interdisciplinary, social science-led
- Led by Prof. Jim Watson, Sussex
- £410,000 from UKERC
- Start: April 1st 2010, 2 years

Basic idea

Study the experience of other technologies

To understand key uncertainties of potential future pathways for CCS

Work packages

Identify dimensions <-> key uncertainties for CCS

- Literature review – innovation literature - “technology assessment” methods
- Analyse CS stakeholders – criteria, methods

8-10 detailed case studies

- Identify analogues that are analogous to CCS in different dimensions: S&E, finance, public understanding, etc
- Literature, expert interviews

Analyse CCS pathways

- Assess a set of pathways based on lessons from 1 and 2
- Special focus on a) investment climate and b) international comparisons

Reporting and dissemination

Dimensions of uncertainty

Dimension	Uncertainty	Possible theoretical contributions
Speed of development	Will CCS be ready quickly enough to contribute to rapid mitigation?	Pros & cons of intensified innovation (Dodgson et al. 2002; Karlsson and Ahlstrom 1999)
Integration of CCS systems	Components may exist but can whole CCS systems work successfully in an integrated way?	System integration in Complex Product Systems (CoPS) such as air traffic control (Magnusson, Tell et al. 2005)
Scaling up	Can CCS components and systems be deployed at 'utility scale'?	Evolutionary economics (Arthur 1989); problem solving & scaling up (Bergek, Tell et al. 2008)
Economic and financial viability	Will CCS systems be economically and financially viable for investors?	Experience curves (Neij 1997); regulatory economics (Weber and Neuhoff 2009); risk and investment (Gross, Blyth et al. 2007).
Public acceptance	Will CCS be accepted as a legitimate technology for mitigation?	'Legitimation' in technology systems framework (Jacobsson and Bergek 2004)
Variety of CCS pathways	Does 'proving' CCS depend on multiple variants and applications of CCS being commercial?	Different pathways within energy options (van der Laak, Raven et al. 2007); early variety in technologies (Jacobsson and Bergek 2004)

Choosing analogues

Potential analogue	Analogous to what?
Flue gas desulphurisation	Post combustion CCS pathways
The scale-up of coal-fired plants	Scaling-up of CCS
The UK's nuclear power programme	Economic and financial viability of CCS
North Sea oil and gas investment	Transport and storage in integrated CCS systems
Examples from the military, aerospace and other utility sectors	Innovation that is heavily influenced by governments

Who are we?

Sussex

Jim Watson

Florian Kern

Imperial

Rob Gross

Philip Heptonstall

Cardiff

Peter Pearson

Edinburgh

Stuart Haszeldine

Jon Gibbins

Nils Markusson

Hannah Chalmers

Stewart Russell

Navraj Ghaleigh

Francisco Ascui

Mark Winskel

+ Plenty of wider engagement: workshops, interviews, etc