

# **CCS Infrastructure in the UK**

## **An overview of required next steps**

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# Summary

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Sustainable Transitions Research Group

UK CCS Consortium & Imperial IC4S

CCS Infrastructure and Policy Challenges

Conclusion – **C**limate **C**hange **C**hallenges & **C**ommunication

# Sustainable Transitions Research Group

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Sustainable Innovation & Investment Risk

CCS Policy and Infrastructure

## **Previous Work:**

WAL\*MART – Decarbonisation of Supply Chain

Mercedes – Infrastructure and EU/UK planning requirements

WEEE Directive – Identify legal gaps in Directive Review Process

Member State Accession – expertise in Environmental Permitting

## UK CCS Consortium / Imperial

UKCCSC – Research Councils Funded (£2M in TSEC Programme) with input from 14 UK academic institutions

Funding for next evolution planned by EPSRC

Imperial – Storage (Professor Martin Blunt) – also \$70m Qatar CCSRI  
Systems (Dr Jon Gibbins) – also ACCAT member  
Capture (Dr Paul Fennell) – solvent design etc



Imperial College Centre for Carbon  
Capture and Storage

“Towards carbon-neutral  
energy and beyond”

[www.imperial.ac.uk/ccs](http://www.imperial.ac.uk/ccs)

## CCS Infrastructure and Policy Challenges

### **Independent Committee on Climate Change (CCC):**

December 2008 Report recommends decarbonisation of electricity production by 2030. **“CCS is an essential technology for reducing global emissions, but needs to be developed rapidly.”**

### **IEA Energy Technology Perspectives scenario analysis:**

“on average per year 35 coal and 20 gas-fired power plants would have to be fitted with CCS technology, between 2010 and 2050”

### **Proposed commercial scale demonstration and deployment timeline:**

1<sup>st</sup> and 2<sup>nd</sup> generation demonstration plant cycles will be required by 2020, both waves requiring (tapering) government and industry support.

The UK Demonstration plant is to be ready in 2014.

**Decisions for post-2020 action are (now) around 500 weeks away**

## CCS Infrastructure and Policy Challenges

### Advisory Committee on Carbon Abatement Technologies (ACCAT)

"ACCAT's recommendation is that Britain could achieve 10 percent of its generation from CCS by 2020...That is what the government should be aiming for"

"There's enough carbon capture and storage technology around to be able to do it today in basic knowledge terms and equipment terms"

(Peter Whitton, Managing Director - 6<sup>th</sup> March 2009)

- Technology exists with related experience (Ongoing research crucial)
- Political, societal and policy drive required

# CCS Policy Challenges

## Policy Challenges:

- Ownership and Liability (long term)
- Regulation and Monitoring – oversight body (no perverse incentives)?
- Incentivisation – market will not give the complete solution
- Development of Legislation – EU Directives can be adapted  
•(Storage requires a new Directive, good progress being made including some relevant texts agreed on first reading in Europe in December 2008)

## Infrastructure Challenges

- Development of (new) network (pipelines, injection platforms) – (synchronisation with offshore wind deployment and gas field depletion)?
- Licensing/approval methodology for storage site use – lengthy timeline?
- Education and Skills:

SHORTAGE OF PROFESSIONAL ENGINEERS

SHORTAGE OF CRAFT SKILLS

LONGER CONSTRUCTION LEAD TIMES

Lessons from the past – CEGB/National Grid?

## Range of Solutions

### **Renewables and Nuclear have a part to play:**

Silver Bullet argument over – consensus on making progress on all fronts  
CCS would be required if Coal is to be used (50% of global energy mix)

### **Renewables and Nuclear answer a different question, but help towards the same goal:**

CCS keeps CO<sub>2</sub> in the ground – can we achieve negligible rates of leakage per century for millennia?

Renewables & Nuclear keep Coal/Oil/Gas in the ground (can we achieve very low usage rates per century for millennia?)

## Limitations

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Nuclear and wind capacity – waiting times for plant and equipment

CCS funding gap (1/20<sup>th</sup> of the funding received by nuclear/renewables)

**Need to advance on all fronts with a portfolio of solutions**

**Need to advance on all fronts with a portfolio of policy measures**

ETS is not a silver bullet – but the most suitable at present.

Government needs to intervene to address market failures

There is need for a learning policy culture – we cannot pick winners

## Climate Change - Communication

Which Crisis? Financial is just one aspect of environmental and social

Business as usual mindset – project investment (tar sands example)

**Effective engagement with business and government (in a language that they can understand) is crucial**

**Everyone is a stakeholder – “there is no away”**

Industry

Government

Academia

Public

## Next Steps

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UK and Australia have distinct comparative advantages, there is much to be learned in a short space of time from learning by doing alongside collaborative next generation research

Opportunities exist to communicate information and technological developments in a complimentary fashion

Development of the GCCSI can only help this

Skills Training and Public Perception efforts must continue

Global Co-operation is a key factor in effective rapid deployment