International CCS (Projects) – (Policy) Reflections

Tim Dixon

Issues in Governance and Ethics of CCS: Setting the Research Agenda.
UKCCSRC, Cambridge, 7 July 2015

Where is CCS succeeding, and why?

Sleipner
(Source: Statoil)

Great Plains Synfuels
(Source: Dakota Gasification)

Boundary Dam
(Source: SaskPower)

Kemper
(Source: IEA)

Decatur
(Source: US DOE)

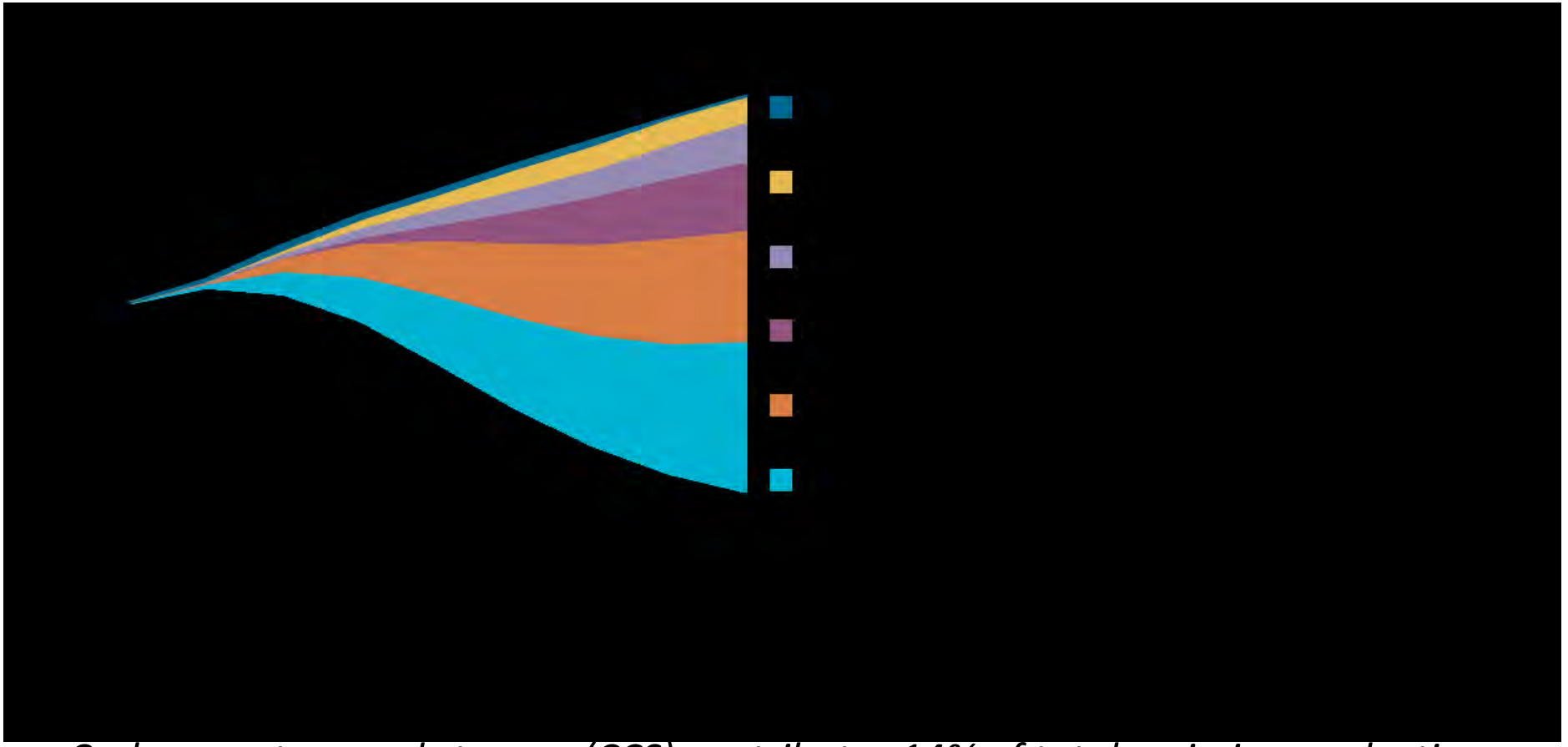
Port Arthur
(Source: Air Products)

Peterhead
(Source: Shell)

Gorgon (Source: Chevron)

Scotford Upgrader
(Source: Shell)

A transformation of supply and use is needed



Carbon capture and storage (CCS) contributes 14% of total emissions reductions through 2050 relative to the 6DS

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IPCC Fifth Assessment Report
Synthesis Report

2nd November 2014
Copenhagen

ipcc
INTERGOVERNMENTAL PANEL ON climate change
WMO UNEP

Key Messages

- Human influence on the climate system is clear
- The more we disrupt our climate, the more we risk severe, pervasive and irreversible impacts
- We have the means to limit climate change and build a more prosperous, sustainable future

AR5 WGI SPM, AR5 WGII SPM, AR5 WGIII SPM

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Sources of emissions

Energy production remains the primary driver of GHG emissions

2010 GHG emissions

AR5 WGIII SPM

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Mitigation Measures

More efficient use of energy

Greater use of low-carbon and no-carbon energy

- Many of these technologies exist today

Improved carbon sinks

- Reduced deforestation and improved forest management and planting of new forests
- Bio-energy with carbon capture and storage

Lifestyle and behavioural changes

AR5 WGIII SPM

	Increase in total discounted mitigation costs in scenarios with limited availability of technologies			
	[% increase in total discounted mitigation costs (2015–2100) relative to default technology assumptions]			
2100 Concentration (ppm CO_2eq)	No CCS	Nuclear phase out	Limited Solar / Wind	Limited Bio-energy
450 (430–480)	138 (29–297) [N: 4]	7 (4–18) [N: 8]	6 (2–29) [N: 8]	64 (44–78) [N: 8]
500 (480–530)				
550 (530–580)	39 (18–78) [N: 11]	13 (2–23) [N: 10]	8 (5–15) [N: 10]	18 (4–66) [N: 12]
580–650				

IPCC AR5 SYR Table 3.2 (2014)

USA and China (and EU)

US-China make game-changing climate pact

■ A major announcement by the US and China pledging action on climate change could alter the slow dynamic of UN negotiations ahead of a crucial 2015 deadline.

The chances of a binding global UN climate deal may have been boosted following a landmark agreement by the US and China.

The joint statement on 12 November was issued by US president Barack Obama and Chinese president Xi Jinping, following bilateral talks in Beijing.[1,2]

Both sides set out substantive targets ahead of UN talks in Lima in December. Given that the US and China account for 42% of global emissions (endsreport.com/45508), the move is highly significant, with lack of Chinese and US commitment an oft-cited excuse for inaction, not least within the EU.

The US says it intends to achieve an economy-wide target to cut emissions by 26-28% below its 2005 level in 2025 and to make best efforts to reduce its emissions

The statement includes a pledge by the US and China to work with other parties "to adopt a protocol, another legal instrument or an agreed outcome with legal force under the Convention applicable to all Parties at the United Nations Climate Conference in Paris in 2015".

Significantly, given the current log-jam over commitments in negotiations, it adds: "The US and China hope that by announcing these targets now, they can inject momentum into the global climate negotiations and inspire other countries

agreement on a joint peer review of inefficient fossil fuel subsidies under the G20.

The US-China move also comes shortly after the EU agreed a 40% emissions reduction target in its 2030 climate and energy package relative to 1990 after fraught negotiations (see p5).

This means just over half of global emissions are now covered by reduction pledges or intentions by these three blocs alone.

The bilateral statement came days after Asia-Pacific Economic Cooperation (APEC) ministers met in Beijing.[3]

US EMBASSY THE HAGUE

A joint US-Chinese announcement on climate change could boost chances for Paris

Including:
Advancing Major Carbon Capture, Utilization and Storage Demonstrations:
Establishment of a major new carbon storage project based in China … and also work together on a new Enhanced Water Recovery (EWR) pilot project….

- **USA:** 26-28% reduction by 2025**; China:** reduce from 2030
- **EU:** 40% reduction by 2030

UNFCCC

- COP-20 Lima, Peru

Courtesy COP20 host

LIMA COP20 | CMP10
UN CLIMATE CHANGE CONFERENCE 2014

UNFCCC next steps

- Out of COP-20 Lima: "Lima Call for Climate Action"
  - confirms intentions for ambitious climate agreement at COP-21
  - will include: Mitigation, Adaptation, Finance, Technology development and transfer, Capacity building, Transparency.
  - based on Intended Nationally Determined Contribution (INDCs) – 'progression beyond current undertakings'
  - further 'technical examination' of high mitigation opportunities'
  - Annex has the draft negotiating text for global agreement

- Further ADP meetings in 2015 (Feb +)

➢ **COP-21 Paris – 30 Nov –11 Dec 2015**

PRE-2020 ACTION FAIR
CARBON CAPTURE
AND STORAGE
TECHNICAL EXPERT MEETINGS

CCS and the Financial Sector

CCS and the Financial Sector

- Unburnable Carbon = fossil fuel reserves which cannot be used under a global carbon budget
- Carbon Bubble = over-valuation of fossil fuel-producing companies if cannot use all reserves
- Stranded Assets = the result of above

The Economist World politics Business & finance Economics Science & technology Cult

Shell, Exxon and carbon

The elephant in the atmosphere

Managers at the biggest oil firms clash with investors over climate change

Jul 19th 2014 | From the print edition

Timekeeper Like 338 Tweet 409

IN SEPTEMBER 2013 a group of institutional investors with $3 trillion of assets under management asked the 45 biggest quoted oil firms how climate change

The Economist World politics Business & finance Economics Science & technology Culture

Energy firms and climate change

Unburnable fuel

Either governments are not serious about climate change or fossil-fuel firms are overvalued

May 4th 2013 | From the print edition

Timekeeper Like 2.6k Tweet 619

MARKETS can misprice risk, as investors in subprime mortgages discovered in 2008. Several recent reports suggest that markets are now overlooking the risk of "unburnable carbon". The share prices of oil, gas and coal companies depend in part on their reserves. The more fossil fuels a firm has

FINANCIAL TIMES

November 30, 2014 8:10 pm

Bank of England to examine financial risks linked to fossil fuels

Pilita Clark, Environment Correspondent

The Bank of England has revealed it is to examine formally for the first time the risks fossil fuel companies pose to financial stability.

In a shift from the bank's past statements, Mark Carney, its governor, has written to MPs informing them that his officials have discussed the idea that most of the world's proven coal, oil and gas reserves may be "unburnable" if global warming is to be kept within safe limits.

“Keep the oil in the soil, and the coal in the hole” - COP-20 Lima

"They Have Destroyed Our Livelihood": Activists Protest Shell and Chevron at U.N. Climate Talks

CCS and Unburnable Carbon

- IEA *"CCS therefore promises to preserve the economic value of fossil fuel reserves and the associated infrastructure in a world undertaking the strong actions necessary to mitigate climate change"* (IEA CCS Technology Roadmap 2013 and IEA World Energy Outlook 2012).
- IPCC AR5 *"The availability of CCS would reduce the adverse effect of mitigation [policies] on the value of fossil fuel assets"* *(IPCC AR5 SYR SPM 2014)*

- Carbon Tracker Initiative (http://www.carbontracker.org/resources)
- Oxford University Stranded Assets Programme (Stranded carbon assets and negative emissions technologies. Working Paper. Feb 2015)
- UCL (McGlade and Ekins. Nature Vol 517 p187-. 2015)
  - CCS will have insignificant impact on Unburnable Carbon

- IEAGHG: Funding work by SGI/Imperial College on role of CCS (2015)

- BP AGM - 16 April 2015
- **Shareholder Resolution 25:**
- "3. Low carbon energy R&D and investment strategies. Investors are interested in BP's post 2015 plans in these areas, including any for carbon capture and storage (CCS)."

theguardian

"BP has promised to be more open about its impact on climate change after 98% of shareholders backed a resolution calling for greater transparency at the fossil fuel group. The company committed to publishing more information on a range of issues, including whether the value of its oil and gas reserves will be damaged by limits on carbon emissions; its investments in low-carbon technology; the scale of carbon dioxide emissions from its operations; the linking of executive pay to greenhouse gas reduction; and its lobbying on climate change. The resolution supported by the BP board came at the end of a three-hour meeting dominated by a subject that has been largely ignored at such investor gatherings."

Terry Macalister. The Guardian. Thursday 16 April 2015 19.18 BST

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SaskPower
Boundary Dam
KEEP
CALM
AND
CAPTURE
ON