Strategies and policies for accelerating global CCS deployment

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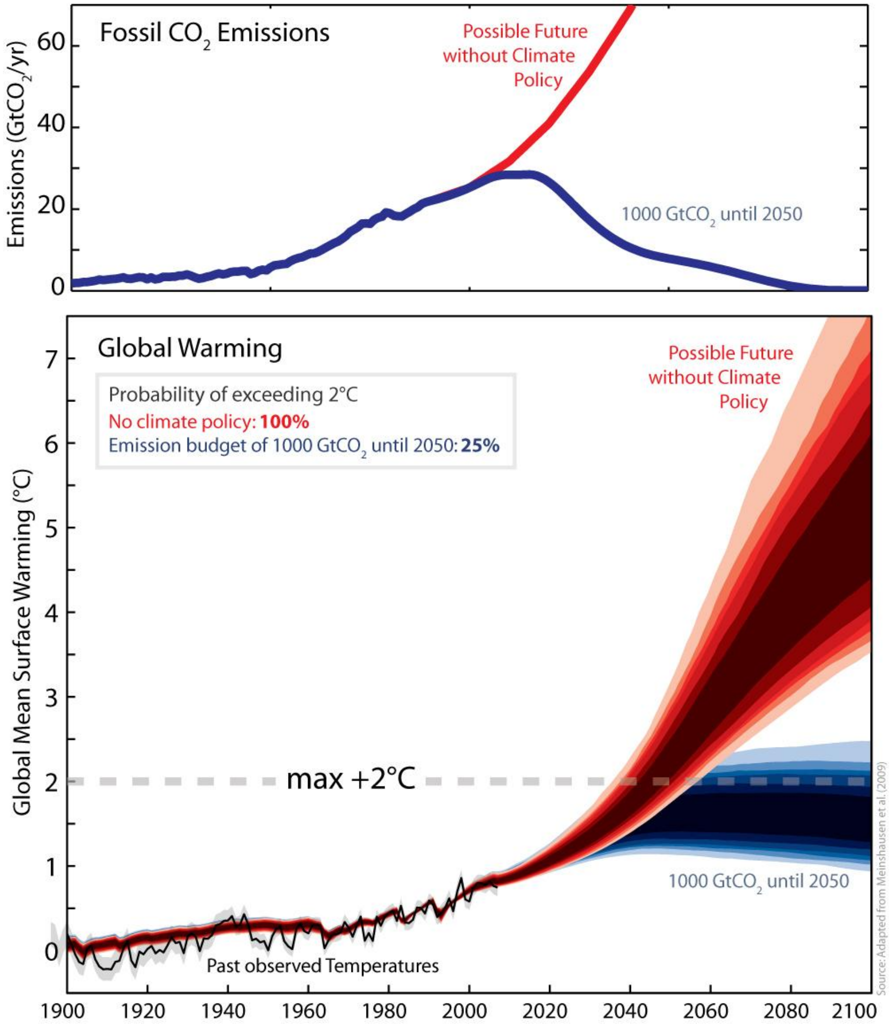
Accelerating global CCS deployment

Four elements:

- Clarity about the objective / IEA CCS Roadmap
- Demonstrations in developing countries / MEF Technology Action Plans
- Mechanisms for accelerating CCS diffusion and deployment in developing countries / knowledge sharing
- Public awareness…

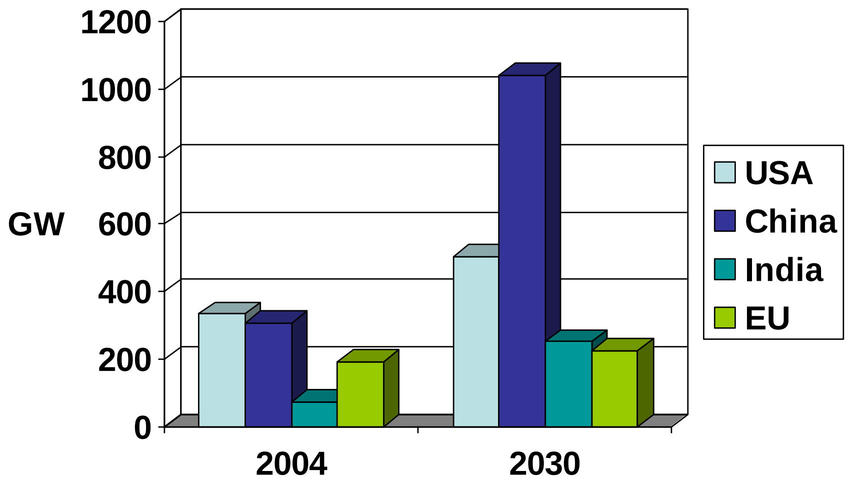
To remain below 2°C we must stay within a global emission budget of 1 trillion tonnes of CO2 by 2050



Source: Meinshausen et al. (2009)

- We have already used 1/3rd of this budget (234 GT) since 2000
- At the present rate of emissions we will use up the remaining 2/3rds by 2030
- Therefore we urgently need an effective global climate policy…
- Over the past year, the EU, US, Canada, Australia have announced a series of efforts to drive CCS development and demonstration, including significant funding
- On track to meet 2008 G8 pledge to launch 20 CCS demonstration projects by 2010

Climate security requires diffusion and deployment of CCS in developing countries



Most of the announced CCS development and demonstration will occur in industrialised countries, with no clear pathway for action in developing countries where CCS will be most important

Source: IEA WEO 2006

- Developing countries account for over 3/4s of the increase in global CO2 emissions between 2004 and 2030
- Growth in coal-fired power generation to 2030: projected trebling of installed capacity in China and India
- Major developing countries will mainly depend on indigenous firms and/or JVs to decarbonise their own economies
- Therefore it is essential that developing countries increase both their access and innovative capacity in order to use new technologies

Some global CCS initiatives to date

- UK-China Near Zero Emission Coal Plant (NZEC) MOU 2005 £3.5m / European Commission pledge €57m October 2009
- EU-China COACH MOU 2006 €1.6m
- Global CCS Institute
- South African National Energy Research Institute (Saneri) / storage atlas
- Italy-China Agreement September 2009 / researcher exchange of information from Enel pilot
- US Energy Secretary Chu October 2009 "affordable deployment within 8-10 years" / US-China Clean Energy Research Centre JV

--- We now need to translate this political goodwill into concrete action

--- This could help to build trust in the lead up to Copenhagen, helping to overcome the current negotiating deadlock around technology transfer

EU-China NZEC demonstration project – into Phase 2

2005 EU-China Summit Declaration on Climate Change and Energy

Phase 1	Initial scoping: explore options for CCS with coal fired power in China	Assess options by early 2009
Phase 2	Detailed design of identified project(s): retrofit and saline acquifer?	Definition stage c.a. 1-2 years ,complete by 2010-11
Phase 3	Construct & operate demonstration project: role of EU companies?	Execute stage 3-4 years, underway by 2014

- Key Chinese Partners are Ministry of Science and Technology (MOST) and the Administrative Centre for China's Agenda 21 (ACCA21)
- Chinese partners also in GeoCapacity, MoveCBM and Cachet
- Phase 1: five work packages
  - Knowledge sharing and capacity building
  - Future energy technology perspectives
  - Case studies for CO2 capture options
  - CO2 storage potential study
  - Policy assessment and roadmap

Draft MEF Technology Action Plans

UK-Australia lead on MEF CCS TAP: IEA Roadmap goal of 100 projects worldwide by 2020

- Draft TAP discussed at Ministerial meeting October 2009
- possibility to propose decisions for Leaders' meeting mid-November 2009

Options which have been proposed include:

- NZEC Phases 2 and 3 funding commitments
- CCS rapid deployment programme: $250m to fund up to 10 projects in developing countries to inject 1-5 million tons CO2 per year from low cost industrial sources by 2015
- extend G8 20 demonstrations to developing countries with $3.5bn commitment from CCS vanguard countries to construct 5 x 400 MW CCS power plants and 5 x 400 MW CCS retrofits for existing power plants in China, India, Indonesia, South Africa…
- vanguard countries' pledge to build no new coal plants without significant CCS capacity running from the start, with a view to full CCS on all new plants by 2020
- pledge to work for a Copenhagen architecture of financial mechanisms and sectoral agreements explicitly designed to accelerate CCS deployment

Challenges for global diffusion of CCS technologies and lowering global production costs

The vast majority of patents are held by private firms. Chatham House report "Who Owns Our Low Carbon Future?" September 2009:

- Inventions in the energy sector take 2-3 decades to reach the mass market. This is mirrored by the time it takes a specific patent to become widely used in subsequent inventions: an average of 24 years across 6 key low carbon energy sectors
- To have a realistic chance of meeting climate goals, the time it takes for climate-friendly technologies to diffuse globally must be halved by 2025
- Technology development is primarily a national and not an international activity. Relatively few patents are jointly-owned, and 9/10 joint owners are from the same country. Far greater collaboration is now needed to speed up the spread of climate-friendly technologies - especially to developing countries
- Carbon intensive companies control much of the key IP for the low carbon economy; e.g. 7 out of the top 20 owners of cleaner coal patents are from the steel sector. Policy-makers need to identify the assets in carbon intensive industries and harness them for low carbon development. A new global database on patent licensing data and best practices would be a quick win
- Across the 6 key sectors the top 5 patent holders are ExxonMobil, Hitachi, General Electric, Mitsubishi and Sharp. Patent ownership concentration is not synonymous with a lack of competition, but it can slow innovation and deployment in some markets depending on business models

This requires pragmatic agreements to ‘protect and share’ IPR and licensing

IPR/competitiveness concerns do not have to limit diffusion:

- Concern over loss of IPR has limited companies willingness to license new technologies in developing countries
- However, while genuine risks exist, in some cases companies may also have incentives to strategically withhold technology from the market to gain a competitive advantage
- China has more patent litigation than in any other country, of which only 2% in 2004 involved foreign parties

A balance of mechanisms is needed:

- **Protect**: A system to provide confidence to firms that sharing agreements will be honoured, e.g. through government-to-government agreements on enforcing IPR protection (Japan-China model)
- **Share**: Mechanisms for diffusion can use a range of approaches and flexibilities inside existing legislation, e.g:
  - Public ownership of foreground IP (e.g. UK Conservative Party position)
  - Compulsory licensing (market terms) and segmented markets (discounted)
  - Commercialisation plans (ZEP proposal for EU CCS demonstration programme)
    - Compensatory liability if commercialisation plans not delivered seems best balance