



Closure Requirements for CO₂ Storage Sites in the Clean Development Mechanism

Tim Dixon
IEAGHG

CO₂CARE Annual Scientific Conference
TNO, Utrecht, 12 March 2013



IEA Greenhouse Gas R&D Programme (IEAGHG)

- A collaborative international research programme founded in 1991
- Aim: To provide information on the role that technology can play in reducing greenhouse gas emissions from use of fossil fuels.
- Focus is on carbon dioxide capture and storage

IPCC Guidelines for GHG Inventories



- Apr 2006
- Vol 2 Energy, Chp 5 - CO2 Transport, Injection and Geological Storage
- Each site will have different characteristics
- **Methodology**

Site characterisation – inc leakage pathways



Assessment of risk of leakage – simulation / modelling



Monitoring – monitoring plan



Reporting – inc CO2 inj and emissions from storage site

- For appropriately selected and managed sites, supports zero leakage assumption unless monitoring indicates otherwise

IPCC Guidelines for GHG – cont



Monitoring Plan

- Measurement of background fluxes of CO₂
- Continuous measurement of CO₂ injected
- Monitoring of injection emissions
- Periodic monitoring of CO₂ distribution
- Monitoring of CO₂ fluxes to surface

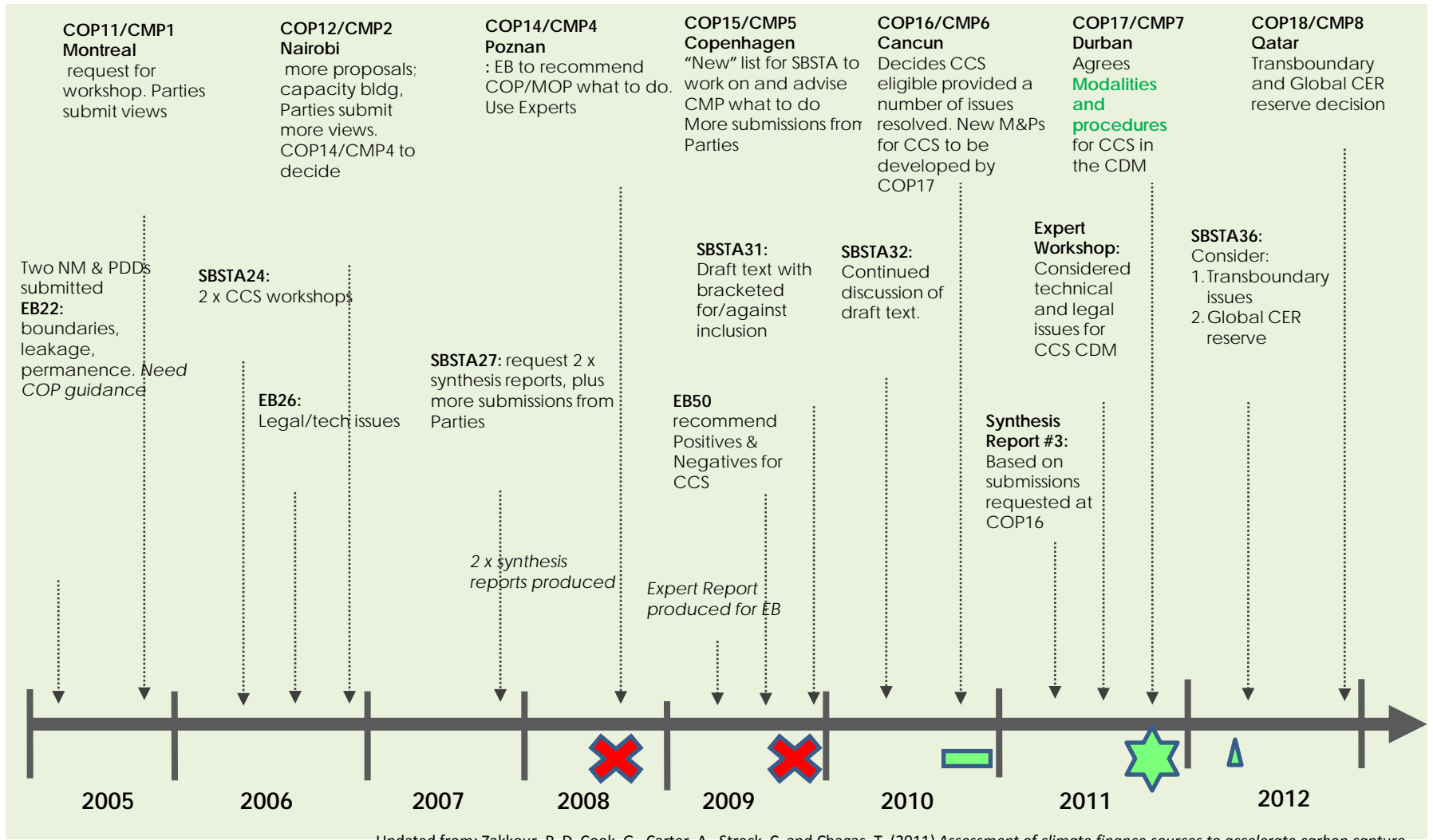
- **Post-injection monitoring – as above, linked to modelling, may be reduced or discontinued once CO₂ stabilises at its predicted long-term distribution**
- Incorporate improvements in technologies and techniques over time

Monitoring technologies – Annex 1

- Deep subsurface technologies
- Shallow subsurface technologies
- Surface / water technologies

Kyoto Protocol and CCS

Considering CCS in CDM since CMP1 Montreal (2005)



Updated from: Zakkour, P. D, Cook, G., Carter, A., Streck, C. and Chagas, T. (2011) *Assessment of climate finance sources to accelerate carbon capture and storage deployment in developing countries*. A report by Carbon Counts and Climate Focus for the World Bank. 16th June 2011. Washington D.C.

Technical Workshop 2011



Abu Dhabi 7-8 Sep 2011

- Brought technical expertise to negotiators
- Technical experts on site selection; modelling; accounting; project boundaries; transboundary; risk assessment; environmental impacts; monitoring; liability (28 talks, several members of IEAGHG Networks).
- Results and experiences from real projects and natural systems, to support modelling and risk assessments
- Good Q&As from CCS negotiators and others

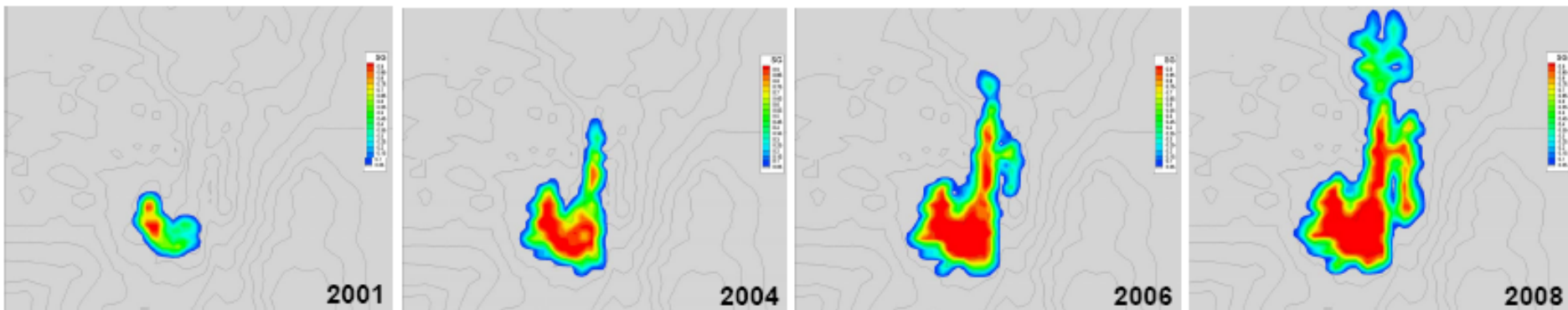
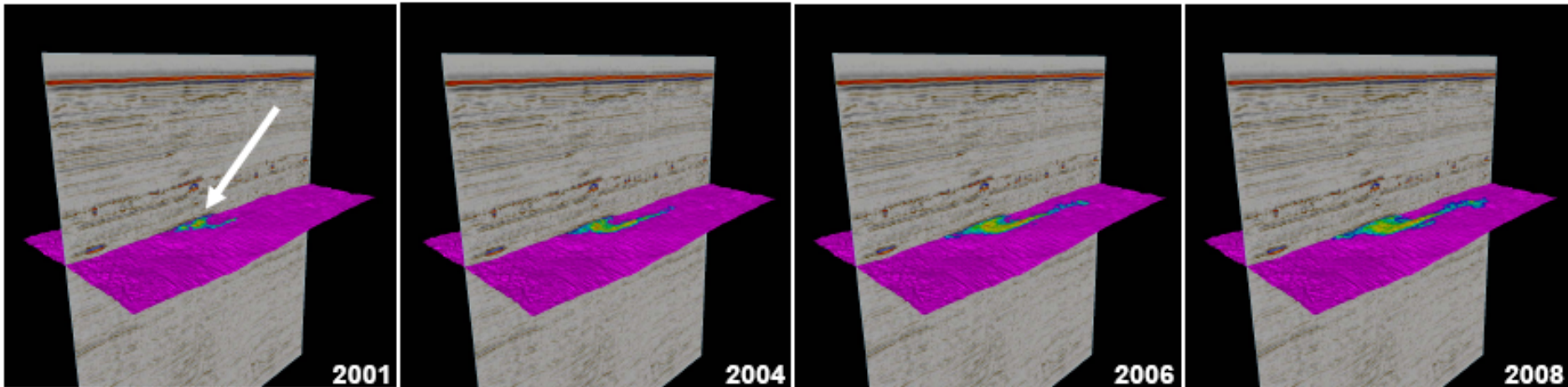


Courtesy H.Olson, BEG, UT

History-matching plume migration at Sleipner (3)

Courtesy A.Chadwick 2011

observed layer growth



numerical flow simulation of layer growth

Match imperfect but sufficient to prove understanding of process

Scope for divergence in long-term predictions is limited

CCS in COP-17, Durban

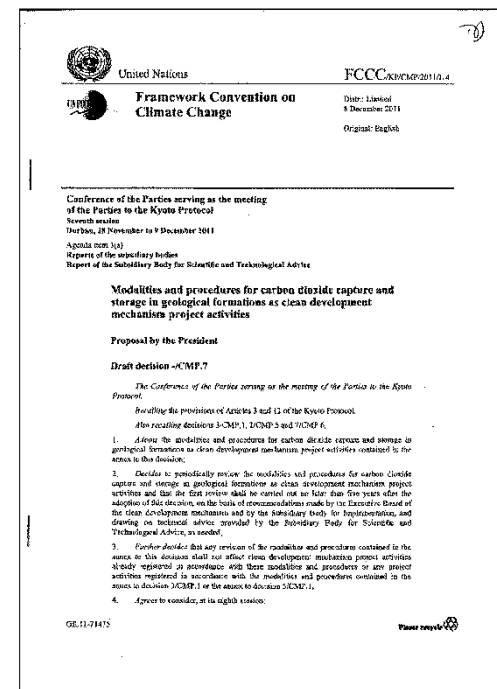


Decision CMP#.7 (final draft was FCCC/KP/CMP/2011/L.4)

- **Agreed and adopted CCS Modalities and Procedures**
- Review within 5 years
- Transboundary left to resolve

Two unresolved issues:

- Transboundary CCS
- Global reserve of CERs
- Consideration by SBSTA, draft decision to CMP-8
- **CMP-8 Doha - both 'parked' until SBSTA 45 (2016)**



M&Ps - Requirements



DOEs – CCS expertise

Participation Requirements

- Host to establish regulations to control and permit CCS. To include site selection and characterisation, storage rights, redress for affected entities, remediation, liability.

Validation by DOEs

- Site characterisation, risk and safety assessment, environmental and socio-economic assessment, liability provisions, financial provision.
- Host country has to agree to financial provision and liability
- Whether host country agrees to responsibility for net reversal of storage

M&Ps - Liability



- **Treatment of local liability** - *health, safety, environmental impacts*
 - Participation requirement; host party establish national laws and regulations that address local liability
- Liable entity identified for each phase of project lifecycle
 - Project participants liable from operation phase until transfer of liability
 - **Transfer of liability to host party after monitoring period ends (20 yrs after crediting period)**
- **Treatment of climate liability** - *obligations to surrender allowances for "net reversal of storage"*
 - Any CO₂ seepage results in retirement of credits equivalent to seepage emissions
 - Host party has 2 options;
 - Ultimate responsibility resides with the host party
 - Ultimate responsibility resides with developed country using the credits, i.e. a buyer liability.

M&Ps – Provisions



- **Financial provisions**
 - Project participants establish financial provision ahead of project proceeding
 - Host party agrees to the financial provision
 - ▶ Appears to provide the flexibility to choose the most appropriate instruments
- **CER Reserve Account**
 - 5% of issued CERs held in reserve account for the purpose of accounting for “net reversal of storage”
 - CERs released once the last certification report has been received, i.e. at least 20 years after crediting period

M&Ps – Project Closure



- CDM project closure when monitoring stops
- Monitoring stops when:
 - Not less than 20 years after last CDM crediting period
 - No seepage observed in previous 10 years
 - All available evidence from observations and modelling indicates CO₂ will be completely isolated from the atmosphere in the long-term, as demonstrated by:
 - History matching “confirms that there is agreement” of modelling and monitoring
 - Modelling and observations confirm no future seepage expected
- Enables transfer of liability to host party
- Enables final certification report, which triggers release of CERs from Reserve Account to project participants

M&Ps – Liability Transfer



- Transfer from project participants to host Party can be effected after:
 - Monitoring has been terminated
 - Host Party establishes that any conditions in the initial 'Letter of Approval' by CDM's Designated National Authority, and in relevant laws and regulations, have been complied with
 - ie. that the host Party had agreed to the Financial Provision, had accepted the allocation of liability, and whether had accepted the climate liability obligation

Useful information sources



- UNFCCC Durban
http://unfccc.int/meetings/durban_nov_2011/meeting/6245.php
- UNFCCC Doha
- <http://unfccc.int/2860.php#decisions>
-



Thank you