



Brazil and CCS-CDM

A Brazilian Perspective (not EB!)

Paris, 21 April 2006

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Brazil and CCS

- Petrobras is injecting CO₂ in an oil well in Bahia since 1987
- Pure CO₂ stream comes from a nitrogen fertilizer factory
- Small amount of CO₂ injected for EOR
- Accumulated injection estimated as 400.000 t CO₂ (during total period)
- CCS is a mitigation option but legitimacy is to be proved (compared to nuclear)



Mandate from 7/CMP.1

- (5) Requests the Secretariat to organize in conjunction with the 24th session of SBSTA (May 2006) a workshop on considering CCS as CDM project activity taking into account issues related to project boundary, leakage and permanence;
- (6) Invites Parties to provide to the Secretariat by 13 Feb 2006 submissions on the consideration of CCS as CDM project activity taking into account issues related to project boundary, leakage and permanence and on other issues to be considered in the workshop referred to in para 5;



Mandate from 7/CMP.1

- (7) Requests the Executive Board to consider proposals for new methodologies for CCS as CDM project activity with a view to make recommendations to the COP serving as the MOP to the KP at its 2nd session on methodological issues, in particular with regard to project boundary, leakage and permanence; **(not encourages development of new methodologies!!!)**
- (8) Decides to consider at its 2nd session submission by Parties, the report of the workshop and the recommendations by EB as referred in paras 5,6 and 7 with a view to adopting a decision on guidance to the EB of CDM on how to consider CCS as CDM project activity taking into account issues related to project boundary, leakage and permanence;



Geological x Ocean Storage

- Mandate refers to CCS and not to geological storage – it also includes ocean storage;
- First day of the meeting referred only to geological storage leading to misleading understanding;
- For instance, there was emphasis on fraction retained in appropriately selected and managed geological reservoirs is very likely to exceed 99% over 100 years and is likely to exceed 99% over 1,000 years;
- No mention that in the case of ocean storage, depending on the depth of injection and the location, the fraction retained is 65-100% after 100 years and 30-85% after 500 years (lower at a depth of 1,000m and higher at 3,000m)



IPCC x UNFCCC

- IPCC deals with natural and anthropogenic emissions;
- UNFCCC only deals with anthropogenic emissions;
- IPCC is conservative in the guidance for preparation of national inventory requesting an upper bound for the estimates;
- CDM EB is being conservative in its guidance for CDM project activities requesting lower estimates for the baseline and higher estimates for project emissions;



Removal or Emission Reductions?

- Sink (Article 1 para 8 of the UNFCCC)
- Means any process, activity or mechanism which removes a greenhouse gas, an aerosol or a precursor of a greenhouse gas from the atmosphere.
- CCS is not a sink!
- (only if we consider together with biomass uptake)



Modalities and Procedures

- Decision 17/CP.7 (Annex - Dec. 3/CMP.1) deals with emission reductions but not with permanence;
- Decision 19/CP.9 (Annex – Dec. 5/CMP.1) deals with permanence but refers to afforestation and reforestation only. (treatment of LULUCF project activities under the CDM – para 3 Dec.5 /CMP.1)
 - If CCS is LU – not allowed!
- Lack of guidance for EB on the modalities to apply in the consideration of proposed new methodologies;
- Requested guidance to COP/MOP 1;



Permanence

- CCS is not solving the problem of Climate Change if there is leakage or project emissions;
- Just buying time;
- Under CDM there is no net emission reduction but authorization of equivalent emissions from Annex I;
- Called previously by Greenpeace as Time Bomb;
 - Allowing increase emissions in Annex I;
 - Increasing concentration of CO₂ in the atmosphere;
 - Increase CO₂ storage;
 - In case of massive leakage: sudden and rapid increase in concentration in a higher concentration level in the future – may lead to run off depending on the relative values (ton in a different time has not the same impact – or ton is a different ton)
 - No financial compensation for climate that will change



Project Boundary

- CO2 stored is important !
 - To estimate emission from the project activity (CCS project leakage)
 - To estimate emissions outside project boundary (CDM leakage)
- How to define project boundary? (Sleipner case)
- How to monitor (small area of the project or total reservoir)
- How to measure the CO2 stored?
 - Art 12 para 5 item b of KP
 - Real, **measurable**, and long term benefits related to the mitigation of climate change;
 - What is a **realistic model**?



Leakage

- Inside project boundary (CCS project leakage)
 - Risk of massive project emissions
 - Seismic activity like in Japan (**Liability problem**)
 - Long term failure of sealing
 - CO₂ injection is different from natural gas or water injection in EOR
 - Existing wells already represent a risk – represent existing fractures of natural reservoir
- Outside project boundary (CDM leakage)
 - International Waters (Bunker Fuel !!!)
 - Cross-border transfer of CO₂ (**Liability problem**)
 - Lateral flow of CO₂ (depending on definition of boundary)



Other Issues

- Liabilities
 - Forever
 - Government liability is not acceptable under CDM by both AI and NAI
- Time Horizon
 - Current CDM limited to 21y or 60y
 - Compared to few centuries (or few millennia) for CCS
 - Intergenerational problem
 - Not agreement or accounting problem !!!
- Environmental Impacts
 - Deep ocean storage – elevated CO₂ can harm marine organisms; immediate mortality close to CO₂ lakes
 - Geological storage – diffuse leaks



Conclusion: CCS(-CDM?)

- Decision by COP/MOP not by EB or MP
- Possibility of using two track approach
 - CCS as a program under the Convention if the appropriate mechanism is established
- CDM is not supposed to combat climate change but just reduce compliance cost for Annex I
 - Zero-sum game
 - Is not an adequate mechanism to deal with the complexities of CCS (compared to nuclear)





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Convenção sobre Mudança do Clima

O Brasil e a Convenção Quadro das Nações Unidas

A Revolução Industrial mudou para sempre a relação entre o homem e a natureza. Existe a preocupação crescente de que os impactos, os efeitos do próximo século, as atividades do homem terão mudado as condições básicas que possibilitaram o aquecimento de vida sobre a Terra.

A Convenção Quadro das Nações Unidas sobre Mudança do Clima de 1992 é uma das mais recentes parcerias dos quais países de todo o mundo estão se unindo para enfrentar esse desafio.

A Convenção sobre Mudança do Clima enfoca um problema especialmente inquietante: não estamos mudando a forma com que a energia solar interage com a atmosfera e escapa dela e conosco o risco de alterar o clima global. Entre as consequências positivas, estão um aumento na temperatura média da superfície da Terra e mudanças nos padrões climáticos mundiais.

Relatório de Referência
Comissão Brasileira de Mudanças Climáticas (COMBCLIMA)

Comissão de Ambientes da Carta de Ratificação do Protocolo de Quioto
Departamento de Recursos do Ambiente, Recursos do COMBCLIMA

IPCC
Mudanças do Clima 2007

Protocolo de Quioto
Tratado de Ratificação do Protocolo de Quioto em Brasília