



# Inclusion of Carbon Capture and Storage Projects as CDM project activities

## View of the United Arab Emirates

UNITED ARAB EMIRATES  
MINISTRY OF FOREIGN AFFAIRS



الإمارات العربية المتحدة  
وزارة الخارجية

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## Introduction

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### **Our view for CCS in general:**

- > Fossil fuels will continue to play a central role in the global energy mix.
- > CCS has emerged as a critical technology for minimizing the carbon footprint of the energy source in a carbon constrained world and expected to remain an indispensable component of broader global strategy to control the climate change.
- > CCS projects face considerable barriers particularly related to cost.
- > The inclusion of CCS under CDM will help to address cost related barriers associated with commercial realization of the CCS projects.

### **Our view for CCS in the UAE**

- > Because of its high economic growth, extreme climate and scarce water resources, the UAE has among the highest per capital emissions in the world.
- > Abu Dhabi government has established an ambitious plan to capture CO<sub>2</sub> from a wide range of carbon emitting industrial plants.

# Site Selection

## Technical Aspects

- Each project site is unique
- A geological formation should only be selected as a storage reservoir if, under the proposed conditions of use, no significant risk of either seepage or contamination exists.
- However, it is desired to develop a standard definition of what constitutes “significant risk”.

## Recommendations

- Site selection assessment should be undertaken and include risk assessment and a mitigation plan.
- Higher risks should be addressed in more stringent monitoring requirements.
- Further elaboration needed to establish:
  - Minimum criteria for CO<sub>2</sub> storage site characterization
  - Procedure for site selection, risk assessment and mitigation plans
  - Code of conduct for operation and monitoring of reservoirs

# Monitoring

## Technical Aspects

Project operator must sufficiently monitor their storage site:

- > Detect seepage or contamination and estimate the flux of CO<sub>2</sub> released to the atmosphere.

Measurements & assessments required:

- > Fluid pressure , fluid characteristics, fluxes etc.
- > Active & passive Seismic measurements
- > Geodetic measurements
- > Time –lapse microgravity
- > Electrical resistance tomography
- > Geological & surface monitoring of atmospheric CO<sub>2</sub> concentration
- > Detection of correction or degradation of the injection facilities
- > Comparison between the reported and forecast behavior of CO<sub>2</sub> in the storage complex.
- > Assessment of the effectiveness of any corrective measures taken.

## Recommendations

- Monitoring plans need flexibility covering the different project phases (pre-, during and after the project).
- Monitoring plans need to be updated frequently.
- For each project, the monitoring program and technique should be derived from site characterization and modeling for the particular site.
- Executive Board (EB) might wish to develop a criteria for the assessment of monitoring methodologies and plans for geological CO<sub>2</sub> storage.

# Modeling

## Technical Aspects

- It is a tool to predict the storage behavior of CO<sub>2</sub> for a short, medium and long term period.
- It is not a substitute for monitoring.

## Recommendations

- Accept modeling under the modalities and procedures as a tool for predicting behavior of CO<sub>2</sub> in geological formation and as basis for risk assessment.
- Modeling should be used as a 'living' tool for the simulation of CO<sub>2</sub> storage behavior and monitoring data should flow back into newer modeling.
- Modeling to be used for interpretation of monitoring data as well as to optimize monitoring strategy.

# Boundaries

## Technical Aspects

- Potential migration pathways of the CO<sub>2</sub> plume might show a different behavior than originally predicted.
- In the event that CO<sub>2</sub> does move out of a predefined determined project spatial boundary, the monitoring plan should be revised and reassessed with the option of changing the boundary to ensure all potential seepage locations.

## Recommendations

- CCS project should include all above –ground and underground installations and storage sites including the capture, transportation, and injection components.

## Seepage measuring and accounting

### Technical Aspects

- Seepage should be monitored and quantified.
- Geological and surface monitoring must be performed in order to measure and account for any CO<sub>2</sub> seepage from the storage. Two of the primary CO<sub>2</sub> seepage monitoring techniques are:
  - Isotopic characterization of CO<sub>2</sub> for monitoring, and
  - Diode laser absorption sensors for continuous CO<sub>2</sub> surface monitoring.

### Recommendations

- If seepage occurs during the crediting period, then the amount of seepage emissions should be quantified and deducted from the entitlement for the respective period.
- If seepage occurs after the end of crediting period, then the amount of seepage should be returned to the CDM registry account.
- Seepage could also be accounted and adjusted for with a buffer CER issuance mechanism and liability allocation.
- Seepage and leakage should be part of a long term monitoring plan.

## Transboundary effects

### Technical Aspects:

Additional legal complexities are associated with trans-boundary projects, which might delay the process.

### Recommendations

- Transboundary projects should not be eligible in the initial set up of the modalities and procedures.
- Project proponent should initially be required to demonstrate that there is no trans-boundary effects associated with the project, until sufficient learning has been acquired to permit the inclusion of trans-boundary projects.



## CO<sub>2</sub> Emissions

### **Recommendations:**

All project- associated emissions should be calculated and included in an project estimate at the design phase.

The monitoring plan should periodically measure and verify actual associated emissions during project life.

The monitoring plan data should be verified by 3<sup>rd</sup> party.

Project emissions should include:

- CO<sub>2</sub> Capture and separation activities

- CO<sub>2</sub> treatment and compression activities

- CO<sub>2</sub> transportation activities

- CO<sub>2</sub> Injection activities

## Risk and Safety Assessment

### **Recommendations:**

Health, Safety, and Environment Impact Assessment (HSEIA) study should be performed through an independent qualified entity.

A “Term of Reference” document defining the HSEIA scope, objectives and methodology consistent with CDM modalities and procedure requirement should be submitted and approved by the regulatory authorities.

HSEIA studies should use a probabilistic risk assessment methodology and its scope should cover entire boundary.

Results of HSEIA should be reviewed by national and regulatory authorities.

# Liability

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## **Recommendations:**

Initially all liabilities should rest with the project proponent, throughout the project life cycle and up until proper storage closure has been demonstrated.

The long term liability for the storage site should be transferred to the host country , either through national regulation or a negotiated agreement specific to the project.

Long term liability scheme should be finalized during project permitting stage.

## Conclusion

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- **We support the inclusion of CCS in CDM.**
- **We understand the concerns of other parties and that issues raised and identified in previous discussions are valid and need to be addressed in a satisfactory manner.**
- **We believe that the issues can be solved based on the current work done in many projects, guidelines, and studies and experiences gained.**
- **We support the idea that the existing CDM modalities and procedures should be utilized to the maximum, however certain CCS related issues need to be further elaborated.**

### **Additional to the discussed and addressed issues, we support :**

- > The establishment of a CCS working group to support EB in its appraisal procedure for methodologies and projects and to set up a new sectoral scope covering CCS
- > The establishment of Compliance & Compensation Fund covering accidents, seepage avoidance, monitoring and corrective actions for long term risk mitigation

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**Thank you  
for  
your kind attention.**