



SUBMISSION BY INDONESIA

Proposal by the Government of Indonesia on

Carbon Dioxide Capture and Storage in Geological Formations as Clean Development Mechanism Project Activities

The Meeting of Parties serving as the 6th Conference of the Parties to the Kyoto Protocol (CMP-6) held in Cancun in December 2010 in its Decision -/CMP.6 has decided that carbon dioxide capture and storage in geological formations (CCS) is eligible as project activities under the Clean Development Mechanism (CDM), provided that the issues identified in Decision 2/CMP.5, paragraph 29, are addressed and resolved in a satisfactory manner.

The Government of the Republic of Indonesia welcomes the adoption of Decision -/CMP6. It believes that the decision is a critical step forward in promptly deploying CCS at a global scale, including in developing countries, as required to avoid dangerous climate change in a responsible and safe manner.

Pursuant to the Decision -/CMP.6, paragraph 4, Parties are invited to submit their views on how to elaborate modalities and procedures for the inclusion of carbon dioxide capture and storage in geological formations as project activities under the clean development mechanism. The Government of the Republic of Indonesia, consistent with its previous submission as contained in FCCC/SBSTA/2010/Misc.2, welcomes this opportunity.

In that regard, the Government of the Republic of Indonesia:

- a. Reiterates that inclusion of CCS in the CDM does not imply any obligation whatsoever to any developing countries to deploy CCS. Yet it provides options and financial support for those developing countries that wish to do so according to their respective national circumstances;
- b. Believes that the process of drafting modalities and procedures related to CCS in CDM as stated in paragraph 2 of Decision -/CMP.6 in addressing important issues listed in paragraph 3 needs to take into consideration the existing works undertaken by credible international and specialized organizations experiences by Parties with knowledges in the engineering, geological, legal, social and environmental as well as financial aspects of CCS representing different geographies, including country's report on carbon dioxide capture and storage in geological formations in order to have wide spectrum of CCS value chain;
- c. Notes that the following key documents are essential in addressing the important issues listed in paragraph 3 of Decision -/CMP6: (i) Intergovernmental Panel on Climate Change (IPCC) Special Report Carbon Dioxide Capture and Storage (2005); (ii) 2006 IPCC Guidelines for National Greenhouse Gas Inventories, particularly elaboration on Tier 3 Methodology; (iii) London Protocol 2009; (iv) Implications of the Inclusion of Geological CO₂ Capture and

- Storage as CDM Project Activities, A report for the UNFCCC, UNFCCC/EB50 Annex 1 (2009); and (iv) European Union Directive on the Geological Storage of Carbon Dioxide 2009;
- d. Emphasizes that the modalities and procedures developed for CCS in CDM should be credible, robust, and practical with clear distinction of responsibilities between the host government, Designated Operational Entity (DOE), CDM Executive Board, and Project Developer;
 - e. Welcomes the Secretariat to conduct a technical workshop with relevant technical and legal experts as stipulated in paragraph 5 of Decision -/CMP.6 after the thirty-fourth session but prior to the thirty-fifth session of the SBSTA, and this technical workshop was suggested in the previous submission FCCC/SBSTA/2010/Misc.2.

Furthermore, in order to address important issues as contained in paragraph 3 of Decision -/CMP.6, the Government of the Republic of Indonesia herewith put forward its views associated with key elements under technical aspects and CDM issues that should be taken into account in the establishment of modalities and procedures related to CCS in CDM.

1. **Site Selection Criteria** (relating to paragraph 3(a) and 3(d) of the Decision)

There are several technical aspects involved, namely:

- Establishment of CCS Best Practices, which consists of site selection and good site characterization procedures based on geologic characteristic of the associated site, including its criteria to ensure permanent storage of CO₂ within the geological formation and take into consideration other key issues related to liability. They also include injection guidelines, the international legal framework and environmental impacts, including transboundary impacts.
- As an integral part of the site characterization and selection, site specific risk assessment needs to be conducted, since CCS Best Practices for site selection should include criteria to guide the risk and safety assessment of the potential CO₂ storage sites.
- Stringent and robust criteria for the selection of the storage site are strongly required for any consideration of CO₂ capture and storage

Given the above technical aspects, CDM related issues are:

- a. CCS Best Practices for site selection that will be used by CCS Project Developers should be adopted by CMP in order to establish "CMP-CCS Best Practices".
- b. In the application of CMP-CCS Best Practices, complete information on site characterization and site selection activities of the agreed site selection with the DNA, should be provided by Project Developer including: (i) site development programmes which includes site preparation and well construction, (ii) operating and maintenance programmes and management, (iii) management of the end storage project: site closure and post-closures, and (iv) its associated time frame that should be included in the Project Design Document (PDD).
- c. In assessing the site selection in the PDD, the Project Developer must demonstrate that it has taken into account CMP-CCS Best Practices and any specific requirement imposed by DNA.

- d. DNA may provide additional considerations and requirements when assessing site selection of a project, in addition to CMP-CCS Best Practices. Such requirements must be explicit, clear and transparent.
- e. For the purpose of project validation, DOE makes an assessment based on the information available in the PDD.
- f. Registration decision by CDM Executive Board should refer to the CMP-CCS Best Practices.

2. **Monitoring Plan** (relating to paragraph 3(b) and 3(d) of the Decision)

There are several technical aspects involved, namely:

- The objective of monitoring should be to confirm that the CO₂ stored underground is permanently sequestered within the geological formation of the agreed selected site.
- Establishment of a guideline on monitoring covering key monitoring parameters that need to be monitored, reporting plans including monitoring criteria. It should also lay down procedures to ensure that monitored data are collected/recorded, reported and stored, which enables independent verification, if required.
- In order to have a complete scope of the monitoring plan, monitoring system should also cover capture and transportation facilities.
- The monitoring plans need to be site-specific, based on the most suitable methodology and technology for the selected site and implemented over the life of CCS project in order to reduce the risk to the environmental integrity of CCS in geological formations.
- The data used in developing monitoring plan must be consistent with the data and insights from the site selection process.
- The monitoring plan must include the entire injection period (i.e. the CDM crediting period) and post injection period and the storage that has been closed (i.e. the CDM post-crediting period).

Hence, CDM related issues are:

- a. A guideline on monitoring and reporting plans that is consistent with 2006 IPCC Guidelines for National GHG Inventories (Volume 2, Chapter 5) should be adopted by CMP.
- b. Site-specific monitoring plan proposed by Project Developer should be agreed upon by DNA. DNA is required to provide its agreement of the monitoring plan after due consideration by the relevant government agencies.
- c. In assessing the monitoring plan in the PDD, Project Developer must demonstrate that it has implemented the guideline adopted by the CMP and any specific requirement imposed by DNA.
- d. DNA may provide additional consideration and requirement when assessing site selection of a project, in addition to the guideline adopted by the CMP. Such requirements must be explicit, clear and transparent.
- e. For the purpose of project validation, the DOE, if required, can make assessments of the monitoring plan based on the information available in the PDD, and to check whether the CMP monitoring plan criteria were applied accordingly.
- f. For the purpose of periodic project verification, whether the agreed monitoring plan has been applied by Project Developer and the amount of emission reductions was achieved by

the CCS project that has been provided by the monitoring system should be confirmed by DOE.

- g. Registration decision by CDM Executive Board refers to CMP monitoring plan criteria.

3. **The Role of Modeling** (relating to Paragraph 3 (c) of the Decision)

There are several technical aspects involved, namely:

- Computer models are required to support important task for site characterization, site selection, risk assessment and monitoring plans, but they should be complemented by other techniques, consistent with 2006 IPCC Guidelines for National GHG Inventories (Volume 2, Chapter 5).
- Computer models need to be continuously improved and learnings between projects are encouraged to be shared.

Hence, CDM related issues are:

- a. The PDD must provide and define the type of computer modeling it uses, including its caveats and limitations.
- b. The PDD must demonstrate that the techniques used to complement the computer modeling address the limitations of the computer modeling.
- c. The agreement of the CCS project between Project Developer and DNA for CCS project development is not based only on the assessment of the techniques used, it shall combine with modelling, measurement and monitoring which is consistent with 2006 IPCC Guidelines for National GHG Inventories (Volume 2, Chapter 5).
- d. For the purpose of project validation, based on the information available in the PDD, DOE makes an assessment to evaluate the appropriateness of the techniques that has been used for the site selection, development and operating programmes.
- e. For the purpose of periodic project verification, the appropriateness of the techniques used is assessed by DOE.
- f. CDM Executive Board makes registration decision accordingly.

4. **Project Boundaries** (relating to Paragraph 3 (e), 3 (f), and 3 (g) of the Decision)

There are several technical aspects involved, namely:

- The project boundary should include the entire chain of a CCS project from the capture, transport, and storage of the CO₂, covering both above-ground and subsurface boundaries.
- The subsurface boundary must includes the potential migratory pathways of the sequestered CO₂.
- Develop associated criteria that will be used to evaluate whether an accurate physical boundary has been established.
- The monitoring plans must cover the entire project boundary.

Hence, CDM related issues are:

- a. Project boundary proposed by Project Developer needs to be agreed with DNA, and providing clear descriptions including its associated data.

- b. The PDD must define the project boundary and demonstrate that robust analysis was conducted when determining potential migratory pathways.
- c. For the purpose of project validation and periodic project verification phase, DOE will make an assessment to check whether the project boundary fulfil the guideline on monitoring and reporting plans adopted by CMP.
- d. CDM Executive Board makes registration decision accordingly.

5. **Transboundary** (relating to Paragraph 3 (h) of the Decision)

There are several technical aspects involved, namely:

- CCS project will require transboundary arrangements where the CO₂ captured need to be transported to a storage site across the border.
- To reach optimization of shared infrastructure and cost efficiency as well as implementation of international standards, CCS transboundary projects in some regions may be inevitable. Under this specific condition, liability regime arrangements needs to be established which based on with the nature of the CCS transboundary project and in line with 2006 IPCC Guidelines for National GHG Inventories.

Hence, CDM related issues are:

- a. It's preferable that CCS project under CDM must be prioritized for projects that fall under a national border rather than CCS transboundary project.
- b. Transboundary arrangements need to be agreed in advance, including but not limited to provisions of liability regime arrangements which covers respective responsibility of all the related host governments/DNA of all participating countries.
- c. CCS transboundary project can be registered further if the national approval of each related countries has been confirmed officially by all the related host governments/DNA of all participating countries.
- d. Reporting of emissions from CCS transboundary projects must be consistent with 2006 IPCC Guidelines for National GHG Inventories.

6. **Accounting for Project Emissions** (relating to Paragraph 3 (i) of the Decision)

There are several technical aspects involved, namely:

- Clear statement from Paragraph 3 (i), "Any project emissions associated with the deployment of carbon dioxide capture and storage in geological formations shall be accounted for as project or leakage emissions and shall be included in the monitoring plans, including an ex-ante estimation of project emissions".
- Monitoring plan for CO₂ accounting at least has three components: (i) to detect loss of containment from the storage formation, (ii) to detect and locate leakage at the surface, and (iii) to quantify leakage.
- 2006 IPCC Guidelines for National GHG Inventories (Volume 2, Chapter 5) can be considered to be used as a reference in which provides a complete description and a comprehensive approach to accounting for project emissions.

Hence, CDM related issues are:

- a. 2006 IPCC Guidelines for National GHG Inventories (Volume 2, Chapter 5) must be used accounting for project emissions.
- b. For the purpose of periodic project verification, (i) project emissions , and (ii) leakage emissions should be accounted and determined.

7. **Risk and Safety Assessment** (relating to Paragraph 3 (j), 3 (k), and 3 (l) of the Decision)

There are several technical aspects involved, namely:

- Risk and safety assessment must form the basis of the approval of site selection and monitoring plans.
- Risk and safety assessment must include the entire project boundary (above-ground and subsurface) and its immediate surroundings when relevant.
- Proposed projects that fail to demonstrate proper risk and safety assessment should not be considered.

Hence, CDM related issues are:

- a. A clear, robust, and criteria for risk and safety assessment in the site selection criteria need to be adopted by CMP.
- b. CCS projects developed under CDM and should include an assessment of the risks and safety of the development and operation of the full CCS chain.
- c. Environmental Impact Assessment needs to be conducted according to the standard CDM practice.
- d. As stipulated in paragraph 3 (j), risk and safety assessment, as well as a comprehensive socio-environmental impacts assessment, shall be undertaken by independent entity(ies) prior to the deployment of CCS in geological formations.
- e. Prior to conducting risk and safety assessment, its works plan in detail shall be endorsed by DNA, and further its result shall be approved by DNA.
- f. The results of risk and safety assessment shall be used for storage site selection, and need to be agreed by DNA.
- g. The PDD must demonstrate that the identified risks are mitigated and will be properly monitored.
- h. Risk assessment criteria during validation phase and identified risks level need to be confirmed by DOE.

8. **Liability** (relating to Paragraph 3 (m), 3 (n), and 3 (o) of the Decision)

There are several technical aspects involved, namely:

- Liability of a CCS project involves liability in the event of the stored of CO₂ seeps to the atmosphere and liability for any impacts to the immediate surroundings caused by CO₂ seepage.
- Liability on the impact to immediate surroundings caused by CO₂ seepage, such as damage to environment, property, or population (i.e. public health) are national issues and should be addressed as provisions in the agreed liability arrangement between Project Developer and

the Host Country which is legally binding agreement by using national law and regulation of the Host Country as governing law.

- Project Developer is responsible and liability on the CO₂ seepage should be hold by Project Developer, and should be remediated by Project Developer during the operating phase (injection phase). Seepage of CO₂ should be monitored and accounted as project emissions.
- During the post-closure phase, Project Developer: (i) should continue to hold the liability for the project, (ii) will continue to monitor the stored CO₂ including any seepage that may be occurred, (iii) continue to be responsible for any remediation, and (iv) responsible to compensate the same amount of CO₂ that were seeped taking from the CERs.
- If there is an option for transferring the responsibility to the Host Country in which Project Developer has no further liability for the stored CO₂, it is required that the predetermined criteria based on performance should be agreed by Project Developer and the Host Country when issuing the injection permit through establishment of legally binding agreement by using national law and regulation of the Host Country as governing law.
- The host country takes over the liability once the project developer has met the predetermined criteria that the CO₂ is safely and considered permanently stored.
- The predetermined criteria may differ between Host Countries.

Hence, CDM related issues are:

- a. The liability arrangements should cover the CCS life-cycle and define clear responsibility for the liabilities to participating entities.
- b. The liability arrangements and its agreement between Project Developer and Host Country, including the predetermined criteria for liability handover and compensation mechanisms must be made clear in the PDD.
- c. Seepage of CO₂ during crediting period should be accounted as project emissions.

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