Implementation of GHG inventory and MRV Concept in Indonesia

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Dr Retno Gumilang Dewi

INSTITUT TEKNOLOGI BANDUNG
Outline

• Background
• Inter-relationship of GHG Inventory, Mitigation, Baseline and MRV
• GHG Inventory and MRV in BUR Issues
• MRV of GHG Inventory Implementation
• Final Remarks
1. Background

- COP-17 in Durban decided to **enhance reporting in National Communications**, including GHG emission inventories, from non-Annex I Parties. **Developing countries should submit Biennial Update Reports (BUR) every two years** in the next international framework of UNFCCC.

- The elements which should be included in the BUR are:
  - Updates of national GHG inventories including a national inventory report;
  - Information on mitigation actions including a description, analysis of the impacts and associated methodologies and assumptions, progress in implementation and information on domestic measurement, reporting and verification; and
  - Needs and support received
2. Inter-relationship of GHG Inventory, Mitigation, Baseline and MRV
2.1 GHG Inventory, Mitigation, and MRV

- Internationally supported mitigation actions will be measured, reported and verified domestically and will be subject to international measurement, reporting and verification in accordance with guidelines to be developed under the Convention;

- Domestically supported mitigation actions will be measured, reported and verified domestically in accordance with general guidelines to be developed under the Convention.

Needs credible GHG Emissions Inventory and Baseline Projection (Reference Emission Level)

Must be measurable, reportable, and verifiable (MRV) in accordance with guidelines to be developed under the convention.
INVENTORY
Presidential Regulation No. 71 / 2011

Baseline (BAU) GRK

Credible Baseline is needed to develop RAN/RAD GRK
Presidential Regulation No. 61/2011
2.2 MRV Concept

The beginning of MRV concept

- “nationally appropriate mitigation actions by developing countries in the context of sustainable development, supported and enabled by technology, financing and capacity building, in a measurable, reportable and verifiable manner” (paragraph 1 (b)(ii), Decision 1/CP.13, Bali Action Plan)

- Elements to be ”MRV”ed.
  1. Mitigation actions/NAMAs
  2. Support (technology, financing, capacity building)
  3. **GHG inventories** ← not explicit in the Bali Action Plan, but a necessary component
2.3 MRV, Mitigation, Baseline/Reference Level

- MRV within the context of mitigation assessment requires **credible** Baseline/Reference Emission Level; It is felt more important as Indonesia has announced ‘non-binding commitment’ for mitigation action to reduce 26% (and further 41%) GHG emissions in 2020;

- Developing Baseline is complex issues, establishing Baseline involves many factors (parameters/variables, data availability and reliability, national/regional policies, etc.) and actors (national, sub-national, sectors, etc.).

- Baseline is important as a basis to measure the success of mitigation actions; Credible baseline required credible inventory → needs to be MRVed
2.4 Baseline/Reference Level

- Future projection of GHG level under the absence of mitigation actions
- Used as reference for measuring emission avoidance resulted from mitigation actions

**Annex I**
(as described in the SB 28 decision)

**Non-Annex I**
(has to interpret the baseline)

![Graph showing baseline and reference levels over time]

- REL
- Historical
- Reduction
- Base year for SNC (2000); TNC (????)
- 26% reduction (avoidance)
- Expected result from mitigation

[Dewi, 2012]
3. GHG Inventory and MRV in BUR Issues
### 3.1 Components of National GHG Inventory in BUR

| National Inventory Report | [Non-Annex I Parties (NAI) [should] include a national inventory report with
• information on the compilation of the inventory
• institutional arrangements
• analysis of key categories
• methodologies, assumptions, emission factors and activity data used
• level of uncertainty
• [changes from previous years]
• quality assurance/quality control
• identification of areas of improvement noting that accuracy will improve over time]

| year | [2010] [N-X]\(^1\) [not more than Y years from the date of last submission], and
• summary information tables of previously reported inventory or inventories (for example for years 1994 and 2000)

| Methodologies (Guidelines) | should use the Revised 1996 IPCC Guidelines
• are encouraged to apply the IPCC good practice guidance
• may use the 2006 IPCC Guidelines

| GHG Emissions | shall estimate; CO2, CH4, N2O
• should estimate; HFCs, PFCs, SF6

| GWP | 1995 IPCC GWP Values (provided by the IPCC Second Assessment Report)

| Reporting Tables | The inventory sectoral tables and worksheets of the IPCC (in electronic format)

\(^1\): N-X denotes that data would be submitted for [x] years prior to the submission year [N].
3.2 Preparation of GHG inventory in Accordance with BUR Guide Line

a. General Issues of BUR

- Definition and allocation of specific roles and responsibilities between government agencies and other entities in the BUR preparation process
- Development of the BUR preparation plan
- Management of the BUR preparation process
- Review and approval of the draft BUR guidelines
- Collection, gathering and archive of all information on BUR
- Response to requests for clarifying the BUR information
- Preparation of the BUR improvement plan

...... b. GHG inventory Issues
b. GHG inventory (Important Issues)

- Clarification of roles and responsibilities between GHG inventory preparation ministry /organization that is in charge of actual work such as GHG emissions estimation and compilation of national inventory report and related ministries that provide activity data and emission factors.
- Management of the progress of GHG inventory preparation process
- Review and approval of the draft GHG inventory, if necessary.
- Determination of methodology (activity data, EF, and estimation)
- Development of data activities
  - double counting
  - many surveys – not match with the needs for inventory
- Capability in developing inventory (units, estimation, conversion, ..?)
4. MRV of GHG Inventory Implementation

• (M)earable
  – National GHG inventories are basically not meant to be measured, but estimated, with some exceptions
  – Key question: Are the emissions estimated accurately → Is the GHG inventory in compliance with relevant IPCC Guidelines?

• (R)eportable
  – Are the emissions/removals reported in a transparent manner?
  – Key question: Is the report comparable with other countries?

• (V)erifiable
  – IPCC Guidelines provide guidance on verification, or QA/QC.
  – Key question: has the country implemented the appropriate QA/QC measures?
4.1 Inventory Development Cycle [refresh]

Start new estimate (see previous inventories) → Identify Key Categories

QC & documentation → Select methods while considering data collection, uncertainty and time series consistency good practice.

Collect data and estimate emissions/removals → QC & documentation

Compile inventory → QC & documentation

Report inventory. → Check/Review Inventory through QA

Different team with inventory team → QA = verification for non-annex 1

Make necessary revisions.(if any) → Conduct key category analysis

QC & documentation → Conduct uncertainty analysis

QC & documentation → QC & documentation

[Dewi and Siagian, 2011]
4.2 Components to be MRV-ed of GHG Inventory

GHG Inventory
- Energy Sector
- Industrial Processes and product use Sector
- Agriculture, Forestry, and Other Land use Sector
- Waste Sector

**National Level**
- Required in BUR/NC
- Also Required by PR 71
- Based on national statistics
- M: Inventory must comply with the IPCC Guidelines.
- R: Inventory should be fully reported using the accepted format.
- V: Inventory should be internally checked during the inventory process (QC) and also by a third party after completion of the inventory (QA).

**Regional Level**
- Required by PR 71 but not by UNFCCC
- Information in regional level GHG inventories may provide useful input to the national GHG inventory
- Definition of MRV not clear

Takeshi and Dewi, 2012

Preparation of the UNFCCC inventory in compliance with the IPCC Guidelines ensures the MRV of the Inventory
### 4.3 Current status of MRV of GHG inventories

<table>
<thead>
<tr>
<th>M</th>
<th>Annex I Parties</th>
<th>Non Annex I Parties</th>
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<tbody>
<tr>
<td></td>
<td>Annex I Parties are required to use the 1996 Revised IPCC Guidelines and the IPCC Good Practice Guidance to prepare annual GHG inventories</td>
<td>Non Annex I Parties should use the 1996 Revised IPCC Guidelines and encouraged to use the IPCC Good Practice Guidance.</td>
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<tr>
<td>R</td>
<td>The UNFCCC Reporting Guidelines for Annex I Parties describes all required information to be included in the National Inventory Report, and the common reporting format tables for emissions/removals to be reported.</td>
<td>The UNFCCC Reporting Guidelines for non Annex I Parties provides information on information to be reported but many elements are voluntary.</td>
</tr>
<tr>
<td>V</td>
<td>The IPCC Good Practice Guidance gives guidance on how Parties are to implement QA/QC procedures in the GHG inventory preparation process. In addition, Annex I Party inventories are subject to an annual review by an expert review team.</td>
<td>The use of the IPCC Good Practice Guidance is voluntary for non Annex I Parties, therefore, QA/QC may not be sufficiently implemented in non Annex I Party inventories. In addition, there is no review by an expert review team.</td>
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Takeshi and Dewi, 2012
4.4 Steps/Functions of the MRV

Mitigation actions

Steps
1. Collect information on potential NAMAs
2. Review and select NAMAs to be reported to UNFCCC
3. Estimate/ check the progress (estimation, reduction, verification results) of the NAMAs
4. Draft report/table for submission

Optional functions:
• Coordinate regional mitigation action activities.
• Develop methods and/or measurement regulations for mitigation actions
• Conduct verification activities (internal review (QC), and a third party review (QA))

GHG inventory

Steps
1. Select estimation method based on IPCC Guidelines
2. Collect data
3. Estimate emissions and removals
4. Draft inventory report
5. Perform quality checks during inventory process and quality assurance activities after completion of inventory

Optional functions:
• Coordinate regional GHG inventory preparation
• Coordinate emission projection activities with Mitigation action team

Support

Steps
1. Collect information on the support and support needs
2. Draft report

Optional functions:
• Conduct verification activities

Crosscutting/Oversight Function

1. Plan the BUR/NC preparation
2. Plan the QA/QC procedures for BUR/NC
3. Manage the BUR/NC preparation process
4. Monitor the QA/QC
5. Manage the ICA process
6. Compile, draft, and submit report.

M and R can be ensured by agency in charge of NAMA, inventory, or support. V should be undertaken by separate agency.

Takeshi and Dewi, 2012
Bottom – Up Flow Scheme of GHG Inventory

AD: Activity Data
P: Parameters Related Emission Factor

[Dewi and Siagian, 2011]
Kyoto Protocol accounting

Annex 1 Countries

National System & Registry System

Eligibility requirements

- Annex I Party systems
- National systems
- National registries
- Emissions inventories
- Kyoto Protocol units
- Review and compliance processes
- Secretariat compilation and accounting database
- Emissions 2008 - 2012

\[ > \quad = \quad < \]

Assigned amount 2008 - 2012

Article 3.1 compliance assessment
Non-Annex 1 (Proposal)

National System (SIGN)

GHG Inventory

National Communication

Projection Emission under BAU

Unilateral NAMAs

Emission Reduction from unilateral (ERUN)

ERUN = BAU Emission-GHG Inventory- (ERSN+ERCN)

ERUN>0: No ER from UN
ERUN<0: ER from UN

Supported NAMAs

Emission reduction from Supported (ERSN)

NAMAs for C-Credit (CDM or other C-market)

International Registry System

Emission reduction for credit (ERCN)

If ERUN beyond the targeted ER: sellable

[Boer and Dewi, 2011]
5. Final Remarks

- Many MRV components have been implemented in developing of GHG Inventory (SNC Document), particularly the use of IPCC Guideline in estimating the GHG level and the inventory development process (QA/QC). However, some improvement are still needed.

- In the context of NAMAs, one important issues is defining baseline/reference of emission level. This will require complex model in projecting of GHG level in all sectors, which is still a challenge for Indonesia.

- Inventory processes involving data collection from regional level is new issues in national inventory scheme and therefore challenge for the MRV processes.

- In the context of BUR, a lot of preparations are needed. Defining the roles of various institutions in the MRV processes is also still a challenge.
Thank You

gelangdewi@yahoo.com
geland@che.itb.ac.id