

Proceedings of the 11th Workshop on Greenhouse Gas Inventories in Asia (WGIA11)

- Capacity building for measurability, reportability and verifiability -

5-7 July 2013, Tsukuba, Ibaraki, Japan



Greenhouse Gas Inventory Office of Japan (GIO), CGER, NIES

Center for Global Environmental Research



National Institute for Environmental Studies, Japan



Proceedings of the 11th Workshop on Greenhouse Gas Inventories in Asia

- Capacity building for measurability, reportability and verifiability -

5-7 July 2013, Tsukuba, Ibaraki, Japan

Greenhouse Gas Inventory Office of Japan (GIO), CGER, NIES

Center for Global Environmental Research



National Institute for Environmental Studies, Japan



Proceedings of the 11th Workshop on Greenhouse Gas Inventories in Asia
- Capacity building for measurability, reportability and verifiability -

Prepared by:

Greenhouse Gas Inventory Office of Japan
Center for Global Environmental Research (CGER)
National Institute for Environmental Studies (NIES)
16-2 Onogawa, Tsukuba, Ibaraki 305-8506 Japan
Fax: +81-29-850-2219
E-mail: www-gio@nies.go.jp
<http://www-gio.nies.go.jp>

Copies available from:

Center for Global Environmental Research (CGER)
National Institute for Environmental Studies (NIES)
16-2 Onogawa, Tsukuba, Ibaraki 305-8506 Japan
Fax: +81-29-858-2645
E-mail: www-cger@nies.go.jp
<http://www.cger.nies.go.jp>

Copyright 2013:

NIES: National Institute for Environmental Studies

All rights reserved. No part of this publication may be reproduced or transmitted in any form or by any means, electronic or mechanical, including photocopy, recording, or any information retrieval system, without permission in writing from NIES. However, NIES does not own the copyrights to the presentation materials contained in this publication.

All copies in PDF format are available from: <http://www.cger.nies.go.jp>

This publication is printed on paper manufactured entirely from recycled material (Rank A), in accordance with the Law Concerning the Promotion of Procurement of Eco-Friendly Goods and Services by the State and Other Entities.

Contents

Foreword	i
Preface	ii
List of Acronyms and Abbreviations	iii
Photos of the Workshop	v
1. Executive Summary of WGIA11	1
2. Workshop Report	5
2.1 Mutual Learning.....	5
2.1.1 Energy Sector.....	7
2.1.2 Agriculture Sector.....	10
2.1.3 Waste Sector	13
2.2 Opening Session	18
2.3 Session I: Progress of National Communication and Biennial Update Reports	20
2.4 Session II: Introduction to the Preparation of Biennial Update Reports	21
2.5 Session III: National Systems for Periodical National GHG Inventory Preparation ..	22
2.6 Session IV: Relationships between Inventory and Mitigation Measures and Nationally Appropriate Mitigation Actions	23
2.7 Session V: Enhancement of Network for Supporting Measurement, Reporting and Verification at Various Levels	25
3. Abstracts	29
3.1 Opening Session	29
3.2 Session I.....	30
3.3 Session II	33
3.4 Session III.....	39
3.5 Session IV	43
3.6 Session V.....	48
Annex I: Agenda	55
Annex II: List of Participants	61

Foreword

The international community now recognizes increases in anthropogenic emissions of greenhouse gases (GHGs) as the primary cause of climate change and its impacts. The 5th Assessment Report published by the Intergovernmental Panel on Climate Change (IPCC) in 2013 stated that “[t]he atmospheric concentrations of the greenhouse gases carbon dioxide (CO₂), methane (CH₄), and nitrous oxide (N₂O) have all increased since 1750 due to human activity.” Moreover, in May 2013, the National Oceanic and Atmospheric Administration of the United States Department of Commerce announced that the Mauna Loa Observatory in Hawaii observed that the daily mean concentration of atmospheric carbon dioxide levels surpassed 400 parts per million (ppm) for the first time. In order to address mitigation and adaptation on the climate change, all of us on the globe have been making more efforts than ever in both scientific and political fields.

Furthermore, “measurement, reporting and verification”, abbreviated as MRV, are important for ensuring the transparency and accuracy of each country’s mitigation actions by quantifying anthropogenic GHG emissions. In this respect, national GHG inventories, which provide information on the GHG emissions and their trends over time, play a critical role as a basis for decision makers to design and implement strategies of their countries’ mitigation actions for reducing GHG emissions.

In order to support enhancement of capacities on national GHG inventories in Asian countries, the National Institute for Environmental Studies (NIES) has been organizing the “Workshop on GHG Inventories in Asia” (WGIA) annually since November 2003 with the support of the Ministry of the Environment of Japan (MOEJ). This workshop supports government officials, compilers, and researchers in the Asian countries to develop and improve their GHG inventories through enhancing regional information exchange. The Greenhouse Gas Inventory Office of Japan (GIO), affiliated with the Center for Global Environmental Research (CGER), NIES, has functioned as the Secretariat for this workshop since its first session.

This CGER report serves as the proceedings of the 11th WGIA, which was held on July 5-7, 2013, in Tsukuba, Japan. We hope that this report will be useful for all those who work in the field of GHG inventory as well as climate change and will contribute to the further progress of inventory development in Asia.

Hitoshi Mukai

Hitoshi Mukai

Director

Center for Global Environmental Research
National Institute for Environmental Studies

Preface

An important lesson that we have learned over the course of experience in the history of the UNFCCC is the importance of “measuring, reporting and verification” (MRV). This includes measuring effects of emissions reduction initiatives; reporting results of the measurement on the international stage; and verifying the status of reductions. MRV ensures the transparency and accuracy of reports on each country’s mitigation actions.

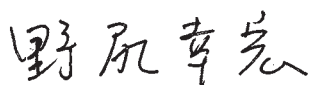
For steady implementation of MRV, it is essential to develop national systems for preparation of national greenhouse gas (GHG) inventories and to improve the accuracy of the inventories. While frequent reporting of national GHG inventories as stated in the Cancun Agreements and Durban Outcomes encourages all Parties to consider improving their inventory quality and developing appropriate institutional arrangements and inventory preparation processes, the GHG inventories are being more and more accepted as being valuable because the inventories support transparency and accuracy of implementing the national mitigation actions in a MRV manner.

Since its first session in 2003, WGIA’s have been held eleven times so far. WGIA’s have contributed significantly to the construction and consolidation of a network of officials involved in GHG inventory preparation in Asian countries and other institutes, and to identifying and solving common issues of relevance to the inventories.

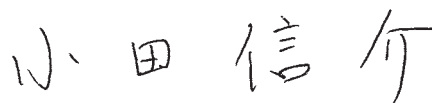
This time, the 11th WGIA (WGIA11) was held from 5 to 7 July, 2013 in Tsukuba, Japan, as a capacity building workshop for MRV. The items set out for this workshop by taking into consideration the current situation of the member countries were all essential for the improvement of their inventories.

The outcomes of the WGIA11 are summarized in this report as Proceedings. It is our hope that this report will be found useful and will contribute to the further improvement of the GHG inventories in the WGIA-member countries.

In conclusion, we would like to thank all the attendees for their participation and active contribution to the success of the workshop.



Yukihiro Nojiri
Manager
Greenhouse Gas Inventory Office
Center for Global Environmental Research
National Institute for Environmental Studies



Satoshi Tanaka
Deputy Director-General
Global Environment Affairs
Ministry of the Environment, Japan

List of Acronyms and Abbreviations

AD	Activity Data
AFOLU	Agriculture, Forestry and Other Land Use
AIM	Asia-Pacific Integrated Model
ALU	Agricultural Land Use
BR	Biennial Reports
BUR	Biennial Update Reports
CDM	Clean Development Mechanism
CGE	Consultative Group of Experts
CGER	Center for Global Environmental Research
CH ₄	Methane
CO ₂	Carbon dioxide
COP	Conference of the Parties
CS-EF	Country-Specific Emission Factor
DCCEE	Department of Climate Change and Energy Efficiency, Australia
DMHCC	Department of Meteorology Hydrology and Climate Change, Vietnam
DNDC Model	DeNitrification-DeComposition Model
EF	Emission Factor
EFDB	Emission Factor Database
F gases	Hydrofluorocarbons, Perfluorocarbons, and Sulphur hexafluoride
FOD	First Order Decay
GEF	Global Environmental Facility
GHG	Greenhouse Gas
GIO	Greenhouse Gas Inventory Office of Japan
GIS	Geographic Information System
GPG	Good Practice Guidance and Uncertainty Management in National Greenhouse Gas Inventories
GPG-LULUCF	Good Practice Guidance for Land Use, Land-Use Change and Forestry
HFCs	Hydrofluorocarbons
IGES	Institute for Global Environmental Strategies, Japan
INC	Initial National Communication
IPCC	Intergovernmental Panel on Climate Change
IPCC-EFDB	IPCC Emission Factor Database
IPCC TFI-TSU	IPCC, Task Force on National GHG Inventories, Technical Support Unit
IPPU	Industrial Processes and Product Use
JICA	Japan International Cooperation Agency
KP	Kyoto Protocol
LDC	Least Developed Countries
LEAD Program	USAID Low Emissions Asian Development Program
LUCF	Land Use Change and Forestry
LULUCF	Land Use, Land Use Change and Forestry

MOEJ	Ministry of the Environment of Japan
MURC	Mitsubishi UFJ Research and Consulting Co., Ltd., Japan
MRV	Measurability, Reportability, and Verifiability / Measurement, Reporting, and Verification
MSW	Municipal Solid Waste
NAI	Non Annex I
NAMA	Nationally Appropriate Mitigation Action
NC	National Communication
N ₂ O	Nitrous oxide
NIES	National Institute for Environmental Studies
MCF	Methane Correction Factor
PFCs	Perfluorocarbons
QA	Quality Assurance
QC	Quality Control
REDD	Reducing Emissions from Deforestation and forest Degradation in developing countries
Revised 1996 IPCC Guidelines	Revised 1996 IPCC Guidelines for National Greenhouse Gas Inventories
RoK	Republic of Korea
RS	Remote Sensing
SBI	Subsidiary Body for Implementation
SBSTA	Subsidiary Body for Scientific and Technological Advice
SEA GHG Project	Regional Capacity Building Project for Sustainable National Greenhouse Gas Inventory Management Systems in Southeast Asia
SF ₆	Sulphur hexafluoride
SIDS	Small Island Developing Countries
SNC	Second National Communication
SPM	Summary for Policymakers
SUR	Suuri-Keikaku Co., Ltd.
SWDS	Solid Waste Disposal Site
SWGA	Workshop on Improvement of Solid Waste Management and Reduction of GHG Emissions in Asia
TNC	Third National Communication
TOR	Terms of References
UA	Uncertainty Assessment
UNFCCC	United Nations Framework Convention on Climate Change
USAID	United States Agency for International Development
USEPA	United States Environmental Protection Agency
WGIA	Workshop on Greenhouse Gas Inventories in Asia
2006 IPCC Guidelines	2006 IPCC Guidelines for National Greenhouse Gas Inventories

Photos of the Workshop

Welcome Address



Mr. Satoshi Tanaka

Overall Chairperson



Dr. Yukihiro Nojiri

Closing Remarks



Dr. Hideo Harasawa

Registration



Meeting Room for Plenary Sessions



Energy



Mutual Learning Sessions
Agriculture



Waste



Reception



Chairpersons for Plenary Sessions

Session I



Mr. Nguyen Khac Hieu

Session II



Mr. Kiyoto Tanabe

Session III



Dr. Rizaldi Boer

Session IV



Mr. Taka Hiraishi

Session V



Dr. Sirintornthep Towprayoon

Discussions in the Plenary Sessions



Information Exchanges in Tea Breaks



1. Executive Summary of WGIA11

1. Executive Summary of WGIA11

The Ministry of the Environment of Japan (MOEJ) and the National Institute for Environmental Studies (NIES) convened the 11th Workshop on Greenhouse Gas (GHG) Inventories in Asia (WGIA11) on 5-7 July 2013 in Tsukuba, Japan, as a capacity building workshop for Measurability, Reportability and Verifiability (MRV). Ever since 2003 the workshops have aimed at supporting Non Annex I (NAI) Parties in Asia to develop and improve their GHG inventories. The 11th workshop was attended by over 110 experts from thirteen WGIA-member countries (Cambodia, China, India, Indonesia, Japan, the Republic of Korea, Lao P.D.R., Malaysia, Mongolia, Myanmar, Philippines, Thailand, and Vietnam), as well as the representatives of the Secretariat of the United Nations Framework Convention on Climate Change (UNFCCC), Technical Support Unit of the IPCC Task Force on National Greenhouse Gas Inventories (IPCC/TFI/TSU), the Regional Capacity Building Project for Sustainable National Greenhouse Gas Inventory Management Systems in Southeast Asia (SEA GHG Project), the U.S. Agency for International Development (USAID), and the Department of Industry, Innovation, Climate Change, Science, Research and Tertiary Education of the Australian Government (DIICSRTE) and Japanese relevant institutes. The Greenhouse Gas Inventory Office of Japan (GIO) at the Center for Global Environmental Research (CGER) of NIES functioned as the WGIA10 Secretariat.

The objectives of the workshop were:

- To enhance sector-specific capacity for inventory compilation (mutual learning)
- To facilitate periodical national GHG inventory preparation for national communications (NCs) and biennial update reports (BURs)
- To discuss the possibility of inventories as a supporting tool for mitigation measures/NAMAs
- To explore issues on measurability, reportability and verifiability (MRV) at various levels.

In the morning of 5th July, the mutual learning sessions, in-depth methodological discussion between two countries by means of studying the partner country's latest inventory in advance, were conducted for a limited number of participants. A SEA GHG Project informal meeting for Phase II was also held in parallel with the mutual learning sessions as a side event of WGIA11.

In the afternoon of 5th July, the Opening Session and Session I were held, and participants in WGIA11 shared information on Japan's climate change policies in the Opening Session, as well as Myanmar's national communication, Viet Nam's progress on preparing its first biennial update report (BUR) and Mongolia's progress, barriers and necessary supports for its first BUR in Session I.

In the morning of 6th July, the participants shared information on the UNFCCC Biennial Update Reporting Guidelines and various supporting activities for BUR preparation provided by IPCC/TFI/TSU, UNFCCC, SEA Project, JICA and USAID LEAD Program in Session II. In the afternoon, the participants shared information on national systems for periodical national GHG inventory preparation in Session III and relationships between inventory and mitigation measures/NAMAs in session IV.

In the morning of 7th July, the participants exchanged information on enhancement of network for supporting measurement, reporting and verification at various levels in Session V. Finally, the participants summed up their discussions during sessions in WGIA11 in its Wrap-up Session.

In WGIA11, the participants discussed various issues by focusing on discussing how to

periodically prepare their national GHG inventories, which comes to be necessary for preparing once every two years as a part of Biennial Update Reports (BURs). The BURs also will be verified through international consultation and analysis (ICA) under the UNFCCC, and non-Annex I Parties have not experienced such verification so far. Hence, the participants were very interested in the process of actual implementation of the ICA. Moreover, the participants confirmed that national GHG inventories take an important role for planning and verifying Nationally Appropriate Mitigation Actions (NAMA) by developing countries. As a result, the network among WGIA participating countries was enhanced through WGIA11; the participants reaffirmed the importance of the inventories as a key tool for mitigation actions; and all participants agreed to continue holding WGIA in the future. In addition, those who joined the mutual learning sessions reconfirmed usefulness of the activities and supported its continuation.

The overview of presentations and discussions on each subject are summarized below.

Opening Remarks

Mr. Satoshi Tanaka, Deputy Director-General of the Global Environment Affairs in the Ministry of the Environment of Japan, stated that climate change is a critical issue for all mankind, and addressing and resolving it is our responsibility for coming generations, and that we must address the challenges involved in facing up to climate change by means of our collective "human wisdom" as members of the human race so that climate change does not have fatal and irreversible consequences for security, welfare, and the economic development of humanity. He also mentioned that it is important for Parties under the UNFCCC to enhance MRV so that the Parties can ensure transparency and accuracy of their mitigation actions.

Progress on National Communication and Biennial Update Reports

Myanmar reported overview of its initial national communication (INC) and explained that it has already started preparing its second NC (SNC). Myanmar also mentioned that it is addressing improvement of quality of its national GHG inventory through the SNC preparation process. Mongolia and Viet Nam made presentations on progress of their first BURs preparation. During discussions on this issue, it was emphasized that establishing national system is an urgent issue in order to efficiently collect data for GHG emission/removal estimation and compile GHG inventories.

COP Decisions and International Supporting Activities for Preparation of Biennial Update Reports by non-Annex I Parties

Information on the UNFCCC Biennial Update Reporting Guidelines and various supporting activities for BUR preparation provided by IPCC/TFI/TSU, UNFCCC, SEA Project, JICA and USAID LEAD Program was shared through Session II. After the representative of the UNFCCC Secretariat explained the Guidelines on BURs, the participants actively exchanged their opinions on contents and other matters of BURs. In addition, effectiveness of software applications and emission factor database provided by IPCC and other institutes was confirmed.

National Systems for Periodical National GHG Inventory Preparation

Representatives of Malaysia, Republic of Korea, Thailand and Japan made presentations on progresses of developing their national systems for national GHG inventory preparation. After the presentations, the participants in WGIA11 exchanged comments and inquiries about arrangements and roles of organizations which formulated the national systems. As a result,

the participants confirmed information helpful for developing and improving each country's national system.

Relationship between National GHG Inventories and Mitigation Measures

Examples of and future plans for utilizing national GHG inventories for implementing mitigation measures were presented by representatives of Australia, Indonesia, Thailand and Japan. National GHG inventories provided inclusive data on past national GHG emissions and removals; hence, it was confirmed that the data were an important resource for considering mitigation measures comprehensively. In addition, the necessity of cooperation between members of administrative organizations, between national level and provincial ones and between inventory compilers and experts on mitigation measures was emphasized in order to comprehend achievements of mitigation measures at various levels, such as national, provincial and project levels.

Enhancement of Network for Supporting MRV at Various Levels

The participants in WGIA11 shared information on activities for supporting MRV at various levels. Presentations on activities by the team of Asian Pacific Integrated Model (AIM), the Asia-Pacific Network for Global Change Research (APN), the Global Environment Center Foundation (GEC), the Institute for Global Environmental Strategies (IGES), the Low Carbon Asia Research Network (LoCARNet), the New Energy and Industrial Technology Development Organization (NEDO) and the Overseas Environmental Cooperation Center (OECC) were provided in this session. Through discussions in the session, the participants recognized that sharing information on MRV at various levels was effective for developing methods of MRV for nationally appropriate mitigation actions (NAMA).

Mutual Learning

Mutual Learning (ML) sessions were conducted in order to improve the individual countries' inventories through exchanging inventories between two countries to learn from each other. The target sectors in WGIA11 were: Energy (Lao PDR and Thailand), Agriculture (China and Myanmar), and Waste (Malaysia and Vietnam). In the sessions, participants in the past ML sessions in the previous WGIA mentioned that the ML activities offered opportunities to re-examine GHG emission/removal estimation methods. As a conclusion in the wrap-up session, the participants in WGIA11 reconfirmed to continuously implement the ML activities in the future WGIA.

Closing Remarks

Dr. Hideo Harasawa, Vice President of the National Institute for Environmental Studies, mentioned that the Mauna Loa Observatory in Hawaii observed that the daily mean concentration of atmospheric carbon dioxide levels surpassed 400 parts per million (ppm) for the first time in May 2013, and stated that all of us on the globe have been making more efforts than ever in both scientific and political fields in order to address mitigation and adaptation on the climate change.

1. Executive Summary of WGIA11

2. Workshop Report

2. Workshop Report

Please note that all presentation materials can be downloaded from the website of GIO:
<http://www-gio.nies.go.jp/wgia/wg11/wg11index-e.html>

2.1. Mutual Learning

Overview of the Mutual Learning

The Mutual Learning (ML) is an activity to improve the individual countries' inventories through a series of processes; 1) exchanging inventories between two countries, 2) learning from a partner's inventory, and 3) exchanging comments on the inventories each other. The primary purpose of the ML is to improve GHG inventories by providing details of methods and data for GHG emission/removal estimation between two countries and exchanging comments on the methods and data. The ML is also expected to foster and strengthen a cooperative relationship among GHG inventory experts. Since the aim of the ML is not criticism or audit, participants can conduct a two-way communication, not a one-way communication like an examiner versus an examinee.

The first mutual learning was held in the annual workshop on the waste sector between GIO and Korea Environment Corporation (KECO) in 2008. The Secretariat of WGIA introduced this activity in WGIA8 in 2010. With the participants' agreement, ML has been held in the following WGIA as one of the sessions.

Table 1 History of Mutual Learning

	2008	2009	2010	2011	2012	2013
Outside WGIA	JPN-KOR (Waste)	JPN-KOR (Waste)	JPN-KOR (Whole inventory)	-	-	-
WGIA activity	WGIA6	WGIA7	WGIA8	WGIA9	WGIA10	WGIA11
	-	-	Introduction to ML (as hands on training)	IDN-MNG (Energy)	KHM-THA (Energy)	LAO-THA (Energy)
	-	-		-	IDN-JPN (IP)	-
	-	-		-	IDN-VNM (Agriculture)	CHN-MMR (Agriculture)
	-	-		JPN-LAO (LULUCF)	-	-
-	-	IDN-KHM-KOR (Waste)		CHN-KOR (Waste)	MYS-VNM (Waste)	

* CHN = China, IDN = Indonesia, JPN = Japan, KHM = Cambodia, LAO = Lao PDR, MMR = Myanmar, MNG = Mongolia, MYS = Malaysia, KOR = Republic of Korea, THA = Thailand, VNM = Viet Nam.

Participants

In November 2012, the WGIA Secretariat advertised the ML to the participants of WGIA, and received applications from 29 teams from 9 parties. Considering the requirements of the applicants and an appropriate balance among sectors and the feasibility of implementation, the WGIA Secretariat set up three pairs (Lao PDR and Thailand on energy sector, China and Myanmar on agriculture sector, and Malaysia and Vietnam on waste sector) on March 2013. Myanmar and Malaysia had first-time experience of ML.

Preparation

A few months before WGIA11, the chosen participants in the ML submitted the materials of their inventories to the WGIA Secretariat, including worksheets used for estimating emissions and reports describing details of methodologies, and exchanged the materials among partner countries through the Secretariat. Through studying the materials provided by each partner country, the participants found good points as well as shortcomings of the inventory of the partner countries. They found the issues to clarify as questions, too. Thus, participants filled such comments and questions to their partner countries into “comment exchange sheets”. After that, the “comment exchange sheets” were shared with the partner countries through the Secretariat. The partner countries responded to these comments and questions before WGIA11.

Table 2 Preparation Process of Mutual Learning

Process	Schedule
Submission of materials	Late Mar. – Mid Apr.
Material Exchange	Early May
Studying the materials	During May
Comment exchange	Late May
Answer to comments	Mid Jun.
Sessions	5 th Jul.

Discussions

In the WGIA11, the participants split into three sessions (Energy, Agriculture and Waste) and discussed sector-specific issues based on preliminary comment exchanges. In order to encourage frank discussion, these sessions were closed, and only experts from countries participating in the ML sessions and some facilitators from Japan entered the session rooms.

Through the discussions, Participants studied partner countries' methodologies to estimate GHG emissions, which are different from ones of themselves, and found out hints to improve their own inventory by questions from the partner country. They also shared their own technical issues (e.g. data collection, adoption of emission factors, national system, etc.) with the partners to overcome the obstacles.

Several participants who attended in the past ML expressed that they had improved their inventory through the experience of MLs. They also emphasized that ML programme was very effective to refine inventory before official submission to the UNFCCC such as NCs and BURs. The participants in WGIA11 recognized efficacy of ML in improvement of their inventories, and agreed the continuous implementation of the ML in future WGIA11s.

Points of discussions and outcomes of each individual ML session summarized in the following sections (2.1.1 - 2.1.3).

2.1.1 Energy Sector

Sector Overview

Lao PDR and Thailand participated in a ML session for energy sector. The general information of the two countries was shown in Table 3 below:

Table 3 Sector Overview

	Lao PDR	Thailand
National total GHG emissions (Gg-CO ₂ eq., without LUCF)	Not provided	236,948 (in 2000)
GHG emissions in the energy sector (Gg-CO ₂ eq.)	1,042 (in 2000)	159,382 (in 2000)
Responsible agency for the inventory	Ministry of Natural Resources and Environment	Office of Natural Resources and Environmental Policy and Planning
Origin of estimation method in the energy sector	Tier 1 of 1996GLs and GPG2000 *	Tier 1 of 1996GLs and GPG2000
Source of emission factors	The default values of 1996GLs and GPG2000	The heating values are country-specific, and other emission factors and parameters were default values of 1996GLs and GPG2000
Source of activity data	Acquired and requested basis data were mainly used and some official statistics were used.	Official statistics

* 1996GLs: Revised 1996 IPCC Guidelines for National Greenhouse Gas Inventories
GPG2000: IPCC Good Practice Guidance and Uncertainty Management in National Greenhouse Gas Inventories

Materials Used

In order to prepare for the ML session in WGIA11, both countries exchanged their documents relevant to GHG emission/removal estimation of the sector each other three months before the workshop. The exchanged documents were as follows:

Lao PDR:

- module1.xls (Spreadsheets)

Thailand:

- Final Report _ Energy Sector.pdf (Documents)
- ghg_energy[1].doc (Documents)
- worksheet_thai_Energy(1)พวข.xls (Spreadsheets)

Questions and Answers

After receiving the materials described above, both countries studied them and provided questions and comments to their partner country approximately two months before the workshop. The classification and the number of the questions were as follows.

Table 4 Classification of Questions

Classification of question	Number of questions	
	from Lao PDR to Thailand	from Thailand to Lao PDR
Estimation method	3	1
Activity data	2	2
Emission factor	1	1
Institutional arrangement	1	1
Quality assurance & quality control	0	1

Outcomes of the Mutual Learning Session

Through the mutual learning, several issues and good practices in the participating countries' preparation of GHG inventory have been identified.

➤Issues and solutions

Lao PDR

The issues raised for Lao PDR were that; 1) country-specific emission factors and heating values were not prepared; 2) allocation of emissions from fuel consumption to a sector was unclear; and 3) processes of verification and quality assurance and quality control (QA/QC) were not well established.

Although Lao PDR had conducted surveys of carbon emission factors and heating values, Lao PDR did not apply results of the surveys to its inventory provided in the ML session. The reason was that Lao PDR was not confident that the results represented its nation-wide circumstances, since the surveys were limited and Lao PDR imports fuels from various countries.

Lao PDR has faced difficulty in sector allocation of fuel consumption. Since oil products have been consumed in many sectors, it was identified that double counting might occur.

Lao PDR established the Inventory Working Group (IWG) to conduct QA/QC and verification. Nonetheless, Lao PDR recognized that there was room for improvement.

Thailand

The issues raised for Thailand were that; 1) a lower tier methodology than desired was used, 2) its national reporting system for GHG inventories was not well established.

Thailand recognized that application of higher tier methodologies was desirable to meet needs of mitigation planning. So far, tier 1 methodologies and default emission factors were applied. A solution for that should be collection of country-specific emission factors and fuel consumption data.

Thailand had "Law on Energy Consumption" that enabled the government to collect fuel consumption data. On the other hand, its national reporting system for GHG inventories was still under development.

➤Good Practice

Lao PDR

The good practices identified for Lao PDR were that; 1) the provided materials were transparent; and 2) an experience of the past mutual learning contributed to the improvement of its inventory.

The inventory of Lao PDR was transparent because Lao PDR used notation keys, including explanation of reasons of the use. In addition, the processes of estimation was able to be traced thanks to the provision of the spreadsheets.

Thailand

The good practices identified for Thailand were that; 1) there was an expert team to compile its inventory; and 2) country-specific heating values were used for the inventory.

Thailand involved a number of professors from universities to compile its inventories. In order to prepare its Third National Communication (TNC), Thailand was planning to expand consultation with stakeholders such as corporations.

Thailand used the country-specific heating values, comparing them with the default values.

➤ **Possible follow-up activities**

Both countries have already close communication such as through visits and will continue communications.

➤ **Suggestions for future ML and WGIA**

There would be an added value if mutual learning was conducted before submission of national communications or biennial update reports.

Table 5 List of Participants in the Mutual Learning on Energy Sector

Country	Name	Organization	Title
Lao PDR	Mr. Mone NOUANSYVONG	Department of Disaster Management and Climate Change, Ministry of Natural Resources and Environment (MONRE)	Consultant
	Mr. Immala INTHABOUALY	Division of GHG Mitigation, Department of Disaster Management and Climate Change, MONRE	Deputy Director of Division
	Mr. Bounthee SAYTHONGVANH	Division of GHG Mitigation, Department of Disaster Management and Climate Change, MONRE	Technical Officer
Thailand	Dr. Woranuch EMMANOCH	Office of Natural Resources and Environmental Policy and Planning	Environmental Official
	Mr. Chessada SAKULKU	Greenhouse Gas Information Center, Thailand Greenhouse Gas Management Organization (Public Organization)	Director
	Ms. Wasinee WANNASIRI	Greenhouse Gas Information Center, Thailand Greenhouse Gas Management Organization (Public Organization)	Assistance Senior Official
	Dr. Karnnalin THEERARATTANANOON	Bureau of Energy Research, Department of Alternative Energy Development and Efficiency	Engineer
Japan	Mr. Akira OSAKO	GIO	GHG Inventory Expert
	Mr. Naofumi KOSAKA		
	Ms. Elsa HATANAKA		
	Mr. Takashi MORIMOTO	Environment and Energy Dept., Mitsubishi UFJ Research and Consulting Co., Ltd. (MURC)	Chief Analyst
	Mr. Tomoki TAKAHASHI	Environment and Energy Dept., MURC	Analyst
	Mr. Masakazu OKADA	Environment Division, SUURI-KEIKAKU CO., LTD.	Analyst

3.1.2 Agriculture Sector

Sector Overview

China and Myanmar participated in the ML session in the agriculture sector (in particular, focus on “Rice Cultivation” and “Agricultural Soil”). The general information of the two countries was shown in Table 6 below.

Table 6 Sector Overview

	China	Myanmar
National total GHG emissions (Gg-CO ₂ eq., without LUCF)	7,467,090 (in 2005)	74,401 (in 2000)
GHG emissions in the agriculture sector (Gg-CO ₂ eq.)	819,970 (in 2005)	22,843 (in 2000)
Responsible agency for the inventory	National Development and Reform Commission (NDRC)	Ministry of Environmental Conservation and Forestry (MOECAF)
Entity in charge of GHG emission calculation	Institute of Atmospheric Physics, Chinese Academy of Sciences (IAP-CAS) (for rice cultivation and agricultural soil in agriculture sector)	GHG inventory and mitigation option analysis team (GHG study team)
Origin of estimation method in the agriculture sector	Country-specific models were used mainly (see below).	IPCC 2006 Guidelines
Source of activity data	Yearbooks	National statistics
Emission factors	CS-EFs constructed from domestic research papers were used.	Default EFs described in 2006GL were used mainly.

Material Used

In order to prepare for the ML session in WGIA11, both countries exchanged their documents relevant to GHG emission/removal estimation of the sector each other three months before the workshop. The exchanged documents were as follows:

China:

- Second National Communication on Climate Change of the People’s Republic of China
- Description and Application of a Model for Simulating Regional Nitrogen Cycling and Calculating Nitrogen Flux (background paper of estimation for agricultural soil)
- Modeling methane emission from rice paddies with various agricultural practices (background paper of estimation for rice cultivation)

Myanmar:

- Chapter 3 of Initial National Communication Report
- Estimation files based on IPCC 2006 Guidelines worksheets (excel) (“Indirect N₂O”, “Direct N₂O”, “Crop Residue” and “CH₄ Rice”)

Questions and Answers

After receiving the materials described above, both countries studied them and provided questions and comments to their partner country approximately two months before the workshop. Answers to the questions were provided prior to the workshop. The classification and the number of the questions were as follows.

Table 7 Classification of Questions

Classification of question	Number of questions	
	from Myanmar to China	from China to Myanmar
Acquisition of activity data	0	3
Adoption of emission factor or parameter	5	2
Future plan	0	1
Other	2	4

Outcomes of the Mutual Learning Session

Through the mutual learning, several issues and good practices in the participating countries' preparation of the GHG inventory have been pointed out for both countries.

➤ Issues and solutions/ Other points for discussion

In question-and-answer sheets and discussion in the ML session in WGIA11, a lot of information was exchanged. Key discussion points for issues and solutions, and other points for discussion were as follows:

- 1) China used updated models for its inventory. China used the CH4MOD model for estimation of rice cultivation and the IAP-N model for N₂O emissions from agricultural soil. Country-specific emission factors by these models covered most of China's rice cultivation areas.
- 2) Information on irrigation patterns in China was shared. Irrigation (water management) patterns for rice cultivation were disaggregated in five patterns in the model, considering flooding, drainage and intermittent irrigation.
- 3) China estimated CH₄ emissions during the fallow season. However, they considered that this emission is not robust and need further consideration in the future.
- 4) Myanmar has one issue that amount of manure of grazing animal is difficult to estimate, because grazing animals are not grazing all time in the field. China talked their method that they count hours of grazing and non-grazing in a day.
- 5) It was found that rice cultivation practices were quite different between China and Myanmar. For the crop residue, China's practice was to be left about 50% in the field, because in double-crop (rice-rice rotation) cultivations of China, the late rice was usually transplanted less than 10 days after the harvest of the preceding rice crop (early rice). On the other hand, Myanmar took out most of crop residue from paddy field for livestock feed or for fuel.
- 6) Rate of crop residue burning in Myanmar was determined by expert judgment taking into account the management practices of lands.
- 7) An advantage of having country-specific methodologies taking into account national circumstances was recognized.

➤ Good Practice

Some Good Practices were pointed out through the mutual learning. Pointed-out good practices were as follows

- 1) Generally, Myanmar's inventory was in line with the IPCC GLs and used spreadsheets from 2006 GLs. Usage of the spreadsheets described in the Guidelines made us easy to understand how to use them.
- 2) Myanmar estimated time series emissions of 1990, 1995 and 2000 to 2005.
- 3) Chinese institutional arrangement for inventory was well established. National Development and Reform Commission (NDRC), which was government, were in

charge of China's National Communications. In addition, China had expert panel to discuss estimation method like Japan (the Committee for GHG Estimation Method).

- 4) China's key methods, which were country specific, were published in academic papers (see above "Materials Used").

➤Possible follow-up activities

Myanmar would recheck the data of crop residue, which included rate and amount of input in the agricultural soils, amount burned on the field, and taken out from the field, because these data needed consistency as cross-cutting data. In addition, Myanmar would check calculation formulas which seemed to be calculation mistake in the spread sheet.

China did not have detailed inventory report of English version which described estimation methods including emission factors and activity data. Of course, it was not required in the NC. On the other hand, China's estimation methods and experiences were very informative and helpful for other Asian countries. Therefore, information sharing for estimation method would be further enhanced by Chinese researchers.

➤Suggestions for future ML and WGIA

The participants' suggestions for future mutual learning were as follows:

- 1) ML may be more fruitful to be done between neighboring countries (e.g. Japan-China, Thailand-Myanmar), because status of neighboring countries were similar. Therefore, it may be easy to understand each other country, and which may make deep discussion in the meeting and question.
- 2) Comparison studies of CS-EFs may be carried out based on the publications from WGIA member countries
- 3) ML was a good practice for each other.
- 4) Time schedule of mutual learning from material exchange to this meeting was appropriate.

In addition, a participant talked his impression that this ML was rare and a good opportunity to learn another country's real GHG inventory and to discuss face to face with another country's persons in charge of inventory compilation.

Table 8 List of Participants in the Mutual Learning on Agriculture Sector

Country	Name	Organization	Title
China	Dr. Shenghui Han	State Key Laboratory of Atmospheric Boundary Layer Physics and Atmospheric Chemistry, Institute of Atmospheric Physics, Chinese Academy of Sciences (IAP-CAS)	Associate Professor
	Dr. Wen Zhang		Assistant Professor
Myanmar	Dr. Khin Lay Swe	Academic Affairs, Yezin Agricultural University	Retd. Pro-Rector
	Dr. Khin Maung Oo	Horticulture Department, Yezin Agricultural University	Retd. Lecturer
Facilitator	Mr. Kohei Sakai	GIO	GHG Inventory Expert
	Dr. Junko Akagi		
	Mr. Kazumasa Kawashima	Environment and Energy Dept., Mitsubishi UFJ Research and Consulting Co., Ltd.	Senior Analyst
	Dr. Kazuyuki Yagi	National Institute for Agro-Environmental Sciences (NIAES)	Research coordinator
	Dr. Yasuhito Shirato	Natural Resources Inventory Center, NIAES	Senior Researcher

2.1.3 Waste Sector

Sector Overview

Malaysia and Viet Nam participated in the ML session in the waste sector. The general information of the two countries was shown in Table 9 below.

Table 9 Sector Overview

Items	Malaysia (2000)	Viet Nam (2005)
National total GHG emissions (Gg-CO ₂ eq., without LUCF)	222,987.6	Not Provided
GHG emissions in the Waste Sector (Gg-CO ₂ eq.)	26,357.1	8,118.1
Responsible agency for the inventory	Ministry of Natural Resources and Environment (MONRE)	Ministry of Natural Resources and Environment (MONRE)
Entity in charge of GHG emission calculation	Department of Environment	VEA and MONRE
Origin of estimation method in the Waste Sector	Department of Environment	VEA and MONRE
Source of activity data (AD)	Multiple agencies are responsible for data collection, based on their scopes of authorities and capacities.	Line ministries and Department of Meteorology, Hydrology and Climate Change (DMHCC)
Source of emission Factor (EF)	Using default values from the 2006 IPCC Guidelines for most EFs and partly applying country-specific EFs for solid waste disposal site and wastewater treatment and discharge	Using default values from The Revised 1996 IPCC Guidelines and the IPCC Good Practice Guidance 2000

Materials Used

The first stage was intended for exchanging actual inventory materials, such as a national inventory report (Waste Sector), reporting tables in a common reporting format (CRF), any other background documents, data, or spreadsheets used for actual emission estimates including unpublished data. The inventory materials exchanged between Malaysia and Viet Nam were shown in Table 10 below.

Table 10 Material used for Mutual Learning-Waste Sector

Country	Inventory report or documents	Spreadsheets
Malaysia	Second National Communication (1995-2000)	2006 IPCC Software for National Greenhouse Gas Inventories
Viet Nam	National Greenhouse gas Inventory in Waste Sector for year 2005	Original estimation files based on UNFCCC software (MS-Excel)

Questions and Answers

Table 11 below summarized points of focus to learn on national greenhouse gas (GHG) inventories of both countries based on the results of the Study Sheet exchanged with each other.

Table 11 Classification of questions raised

Classification of question	Number of questions	
	From Viet Nam to Malaysia	From Malaysia to Viet Nam
Activity data	2	2
Emission factor	1	1
Methodology	5	1
Waste management practice	1	3
Other	1	1

Outcomes of Mutual Learning

The outcomes of the Mutual Learning for the Waste sector were summarized as follows.

➤ Issues and solutions or any other findings from the discussion

Issues and solutions or any other useful findings concerning the national GHG inventories of Malaysia and Viet Nam identified by the discussion were as follows:

- Solid Waste Disposal Site (SWDS)
 - Malaysia has been facing with a dilemma of lack of funds to develop country-specific emission factors for solid waste although its necessity has been fully recognized for some time.
 - Malaysia found difficulty in separating industrial solid waste from municipal solid waste (MSW) for estimating activity data because of their waste management practice in the country and sought a solution to efficiently identify them.
 - Viet Nam found difficulty in collecting activity data, particularly industrial solid waste because an entity responsible for waste management and that for data collection were different, and the ministry in charge of the data collection lacked legal authority of the collection.
 - As a means of improving the estimation of activity data, one of the methodologies and actual experiences for conducting accuracy analysis of MSW generation and population, estimating total MSW generation, and accumulating data on MSW generation at local level was shared by the expert from Japan.

- Wastewater Treatment (WWH)/Wastewater Treatment and Discharge
 - Malaysia has been facing with a dilemma of lack of funds to develop country-specific emission factors for domestic and industrial wastewater although its necessity has been fully recognized for some time.
 - Malaysia was in the process of applying study results conducted by the responsible agency to estimate CH₄ emissions from sludge treatment.
 - In Malaysia, a private company engaged by the federal government was assuming a large and important role in managing almost all of wastewater treatment plants and collecting activity data in Peninsular Malaysia as a result of improvement in its governmental waste management system. On the other hand, for certain states (Sabah and Sarawak), state governments have managed and collected data for the federal government, which required improvements in its data collection efficiencies.
 - Viet Nam found a difficulty in an inefficient top-down data collection approach for some occupation villages and sought a solution to improve its data collection efficiencies.
 - As a means of improving a national GHG inventory preparation, evaluation of tradeoffs in costs, energy, and environment impacts between global warming potential (GWP) and eutrophication potential (EP) including the impacts of EP due to uncollected/untreated wastewater discharge was shared by the expert from Japan.

- **Waste Incineration/Incineration and Open Burning of Waste**
 - Malaysia has started employing incinerators for its domestic waste management practice in the country. Installation and operation of incinerators were regulated by the federal government and closely monitored. Malaysia was collecting data and in the process of including CO₂ emission estimates focusing on incineration of industrial hazardous waste in its national GHG inventory to be included in the third National Communication (NC3).
 - In Malaysia, since open burning was illegal and closely monitored, strict control was imposed on it. Permitted open burning was mostly for agricultural purposes, and its relevant emissions were reported under the Agricultural sector.
- **General Issues**
 - As a means of improving a national GHG inventory preparation, the experts from Japan shared their actual experiences of a few options to develop country-specific emission factors, such as collaborative researches and studies with universities, research institutes, relevant ministries, or utilizing opportunities to be engaged in projects organized by international donors.
 - The expert from Japan shared the importance of developing GHG inventories for estimating waste generations and CH₄ emissions and assessing waste management policies, which was essential to effectively implement measurement, reporting and verification (MRV) for analyzing national future GHG emissions and mitigation actions.

➤ **Outstanding issues**

Outstanding issues concerning the national GHG inventories of Malaysia and Viet Nam identified during the session were listed below:

- Conclusion on whether to include/reflect emissions reduced by CDM projects in a national GHG inventory (For now, it was suggested to include the information on transferred CERs along with a national GHG inventory in order to avoid a double counting or accounting error),
- Determining an appropriate/conservative method to estimate missing required historical data for the First Order Decay method on solid waste disposal for the whole period of the last 50 years by default according to the 2006 IPCC Guidelines (for now, it was suggested to explore surrogate options including assumption with population data, GDP data, or international statistics, or applying the oldest data available for the whole missing reporting years),
- Understanding the methodology of the 2006 IPCC Guidelines to estimate CH₄ emissions for domestic wastewater treatment and discharge and also seeking clarifications on the definition of Figure 6.1 of “Wastewater treatment systems and discharge pathways” in the said guidelines,
- Incorporating a country-specific methodology into the 2006 IPCC Software for National Greenhouse Gas Inventories or developing estimation spreadsheets in MS Excel format to reflect the actual waste management practice in the country (country-specific national circumstances) and to achieve more accurate emission estimates.

➤ **Good Practice**

Good practices in the national GHG inventories of Malaysia and Viet Nam identified through the ML session were listed below:

● **Malaysia**

- The 2006 IPCC Guidelines, which was the most current and more detailed guidelines as of now, was applied in order to identify issues to be tackled efficiently and reflect country-specific national circumstances to achieve more accurate GHG inventories with much motivation in view of continuous improvement in the waste management practice in the country.
- Malaysia strove to conduct national researches and studies to establish national statistics for the use of various official purposes, including the preparation for a national GHG inventory, and published them on its web site.
- In order to verify data reliability, a comparison of study results with other organizations was conducted.
- Malaysia was in the process of applying the most current waste composition data of SWDS to its national GHG inventory and to be included in NC3.
- Good and close relationship between state government including local experts and federal government, especially on establishing statistics to achieve better waste management practice and GHG inventory preparation, has been maintained.
- In order to grant the federal government legal authorities to manage public cleansing and solid waste disposal (excluding some states which have sovereign rights), the Solid Waste and Public Cleansing Management Act (SWPCMA) and the Solid Waste and Public Cleansing Management Corporation Act (SWPCMCA) was enacted and enforced in 2007. It has achieved efficient and effective institutional arrangement and far better waste management, such as an improvement in collecting organic waste component data and smooth data collection for GHG inventory preparation and appropriate management and construction of landfill sites.
- The importance of mutual effect between a national GHG inventory preparation and mitigation measures as well as planning an improvement in institutional arrangement in view of better national GHG inventory preparation and mitigation measures has been increasingly recognized in the country and strives to put them into place.
- A plan to develop country-specific emission factors to the federal government has been periodically proposed.
- Malaysia was planning to refer to the IPCC Emission Factor Database and was considering the use of emission factors established by countries, national circumstances of which were similar with Malaysia.
- Malaysia strove to improve the quality of national GHG inventory by taking into account potentially high CH₄ emitting industries in the next NC.

● **Viet Nam**

- A comprehensive national inventory report for the Waste sector was developed.
- In order to estimate CH₄ emissions for wastewater treatment, five major industries to be focused on in the country have been identified as a result of exerting effort to collect as much activity data as possible.
- Viet Nam strove for better data collection and to prepare for a national GHG inventory in view of BUR and ICA.

➤ **Possible follow-up activities**

The possible follow-up activities discussed during the session were provided below. The WGIA Secretariat intended to respond to the needs of participating countries to the extent possible.

- Follow-ups of ML sessions, including feedbacks on aforementioned outstanding

issues,

- Interactions and information exchange on improving GHG inventories of all sectors with the partner country to the extent possible

➤ **Suggestions for future ML and WGIA**

Suggestions for future ML discussed during the session are provided below. The Secretariat of ML intends to respond to the needs of participating countries to the extent possible.

- Continuing ML Programm since it is a great opportunity, effective and informative exercise for learning and exchanging frank opinions and information with experts in neighboring countries
- Raising the issues on mitigation and mitigation measures and outstanding issues from the ML session to WGIA agenda

Table 12 List of Participants in the Mutual Learning on Waste Sector

Country	Name	Organization	Title
Malaysia	Mr. Mohd Helmi OTHMAN	Policy and Planning, National Solid Waste Management Department	Assistant Director
	Ms. Amy Charlene WONG	Air Division, Department of Environment, Ministry of Natural Resources and Environment	Environment Control Officer
	Mr. Mohd Famey Bin Yusoff	Air Division, Department of Environment, Ministry of Natural Resources and Environment	Principal Assistant Director
Viet Nam	Mr. Quang Tat QUACH	Ozone Layer Protection Center, Department of Meteorology, Hydrology and Climate Change, Ministry of Natural Resources and Environment	Acting Director
	Mr. Thang Ngoc LE	Pollution Treatment and Improvement Department, Centre for Environmental Consultancy and Technology, Viet Nam Environment Administration	Deputy Head of Pollution Treatment and Improvement Department
	Mr. Hieu Khac NGUYEN	Department of Meteorology Hydrology and Climate Change Ministry of Natural Resources and Environment	Deputy Director General
	Ms. Trang Minh DAO	Climate Change Research Center, Institute of Meteorology, Hydrology and Environment	Researcher
	Mr. Akihiro TAMAI	Project for Capacity Building of National Greenhouse Gas Inventory in Vietnam, Japan International Cooperation Agency	Chief Technical Advisor
Japan (Facilitator)	Mr. Hiroyuki UEDA (Chair)	Mitsubishi UFJ Research & Consulting Co., Ltd. (MURC)	Senior Analyst
	Ms. Masako WHITE (Rapporteur)	Greenhouse Gas Inventory Office of Japan, Center for Global Environmental Research, National Institute for Environmental Studies	GHG Inventory Expert
	Dr. Takefumi ODA		
	Dr. Tomonori ISHIGAKI	Center for Material Cycles and Waste Management Research, National Institute for Environmental Studies	Senior Researcher
	Dr. Kosuke KAWAI		
	Dr. Tatsuya HANAOKA	Center for Social and Environmental Systems, National Institute for Environmental Studies	Senior Researcher

2.2. Opening Session

The opening session was chaired by the overall workshop chair, Dr. Yukihiro Nojiri (GIO), and the rapporteur was Ms. Takako Ono (GIO).

The welcome address was delivered by Mr. Satoshi Tanaka, Deputy Director-General, Global Environment Affairs (MOEJ). He welcomed participants in WGIA11 and expressed his gratitude for them to participate in the workshop. He stressed the importance of addressing and resolving climate change urgently towards “below two degrees Celsius” for coming generations. He shared the efforts being made and in-progress by the Government of Japan in various fields under the United Nations Framework Convention on Climate Change (UNFCCC) and the Kyoto Protocol for the target of a 6% reduction for the first commitment period and on the issues of GHG emissions reduction as well as the realization of a low-carbon society in cooperation with the countries concerned, and the Government of Japan would continue to contribute with the full extent of its abilities and resources for negotiations towards realization of an agreement on a new effective legal framework beyond 2020 with all countries’ participation. He also emphasized the importance and implementation of measurability, reportability and verifiability (MRV) to develop national systems for the preparation of national greenhouse gas (GHG) inventories and to improve the accuracy of the inventories. He concluded the address by conveying his expectations for WGIA of continuously assuming a role to support all WGIA participating countries to undertake an important step forward towards coping with issues of climate change and his sincere wish that the discussion at WGIA11 would prove meaningful for all participants.

Mr. Naofumi Kosaka (Japan) gave an overview of WGIA and introduced the organization of WGIA in progress including the Terms of reference (TOR), Organizing Committee (OC), and Advisory Board (AB); objectives; participants; and the agenda of WGIA11. The objectives of WGIA11 were:

- To enhance sector-specific capacity for inventory compilation (Mutual Learning),
- To facilitate periodical national GHG inventory preparation for national communications (NCs) and biennial update reports (BURs),
- To discuss the possibility of inventories as a supporting tool for mitigation measures/NAMAs,
- To explore issues on MRV at various levels,

Mr. Yoshinori Suga (Japan) made a presentation on Japan's climate change policies as well as the current situation of Japan. After showing the global CO₂ emissions in 2010, He explained Japan’s GHG emissions in FY2011, electricity generation trends by source in FY2003-2012, CO₂ emissions trends and historical GHG emissions by sector in FY1990-2011, and CO₂ emissions by sector and actor in FY2011. As the highlight of Japan's climate change policies, he introduced the structure of Japan’s Basic Environment Plan, the outline and objectives of GHG emissions reduction guidelines and the Accounting, Reporting, and Disclosure Program for business entities, recovery and destruction trends of CFC, HCFC, & HFC, the National Campaign on Solutions to Global Warming for the coordinated efforts of the government and citizens including power conservation actions in place to manage the power shortage caused by the Great East Japan Earthquake, and the Local Government Action Plan to implement GHG emissions reduction plan of municipalities. He also provided the basic concept of the Joint Crediting Mechanism (JCM) which would contributed to the ultimate objective of the UNFCCC by facilitating global actions for GHG emission reductions or removals complementing the Clean Development Mechanism (CDM).

Following Mr. Suga's presentation, Dr. Prihasto Setyanto (Indonesia) asked about differences between "Industries" and "Industrial Process" indicated in his slide on Japan's CO₂ emissions by actor in FY2011. Mr. Suga answered that "Industries" included CO₂ emissions from energy consumptions in industries; however, "Industrial Processes" included CO₂ emissions mainly from cement production. Mr. Mone Nouansyvong (Lao, PDR) asked whether there were any other policies addressing climate change and GHG inventories other than introduced environmental plans. Mr. Suga answered that Japan already had sufficient provisions for a national inventory which were included in the Law for the Promotion of Global Warming Measures adopted in 1988; however, added a new policy for a national GHG inventory in accordance with the 2006 IPCC Guidelines for National Greenhouse Gas Inventories in the 4th Basic Environment Plan.

Mr. Taka Hiraishi (Japan) made a statement of the five questions/issues for addressing NAMAs and BURs to be considered during the WGIA11 sessions as follows:

- How the emissions, removals, and emissions reductions resulting from NAMAs should be evaluated/estimated.
- How the emissions, removals, and emissions reductions resulting from NAMAs should be properly reflected in a national GHG inventory included in NCs.
- How the emissions, removals, and emissions reductions resulting from NAMAs can be incorporated into a national inventory? (whatever the case may be policy, project, or sector-level, NAMAs are not comprehensive; therefore, the results reflected in a national GHG inventory may not be consistent with the estimations of emissions reductions resulting from NAMAs.)
- How the preparation of BURs can be achieved by the end of 2014?
- How the emissions, removals, and emissions reductions from NAMAs can be reflected in BURs

Following Mr. Hiraishi's statement, Dr. Rizaldi Bower (Indonesia) stated that it could be quite difficult to properly capture emissions reductions from NAMAs under a national GHG inventory and wish to discuss further on it in other sessions. Mr. Leandro Valmonte Buendia (SEA GHG Project) stated that when NAMAs could be reflected in a national GHG inventory, a base line or the base year was necessary to compare the results of emissions reductions, and the level of disaggregation to be used for a national GHG inventory and NAMAs needed to be well considered. Dr. Nojiri commented that the best way to prepare for an accurate national GHG inventory was an accurate bottom-up approach, and it could be compared to a top-down approach scheme to verify its accuracy; therefore, our efforts needed to be made to make a more accurate national GHG inventories with a bottom-up approach despite many difficulties. Mr. Hiraishi stressed again that there should be a certain understanding and justifications about the difference between NAMAs results and changes in a national GHG inventory, and also there should be some consistency in BUR's GHG inventories which should reflect results of NAMAs and a national GHG inventory included in a NC although it would be a challenge to be tackled within a limited amount of time. Mr. Nguyen Khac Hieu (Viet Nam) mentioned that he hoped for some guidelines from the UNFCCC Secretariat on how emissions, removals, and emissions reductions resulting from NAMAs should be reflected in a national GHG inventory. Dr. Bower stated that there were different understandings of NAMAs between countries, and the issues needed to be also discussed in consideration of COP decisions and its negotiations.

2.3 Session I: Progress of National Communication and Biennial Update Reports

This session was chaired by Mr. Nguyen Khac Hieu (Viet Nam) and the rapporteur was Dr. Junko Akagi (GIO).

In this session, three WGIA member countries' current activities of inventory preparation were presented. One was an overview of Myanmar's latest national communication (NC) (see Table 12), and the others are progress of Viet Nam's and Mongolia's Biennial Update Report (BUR) preparation, which submission is a task for Non-Annex I (NAI) parties by Dec. 2014.

Dr. Junko Akagi (Japan) made an introductory presentation of this session. She overviewed preparation status of next NC and first BUR of WGIA participating countries shown in FCCC/SBI/2013/INF.7. She also pointed out obstacles in NC and BUR preparation of WGIA participating countries based on the information provided by them, and stressed that they needed appropriate support in the relevant matters of finance, human resources, institutional arrangement and data collection.

Mr. Than Aye made an presentation for overview of Myanmar's Initial National Communication (INC). Myanmar submitted their INC in December 2012. At the beginning of his presentation, he introduced newly established Myanmar's National system for environmental policies. After that, he explained methodological background and details of GHG emissions in the INC. He also shared Myanmar's experience in their first inventory compilation with the WGIA participants, and expressed planned improvements for its future SNC and BUR.

Table 13¹: Summary of GHG inventory² for INC of Myanmar

Items	Myanmar (INC)
Submission date (UNFCCC-HP)	26 December 2012
Reporting year	2000 (Estimated also for 2000-2005)
Coverage (sector & gas)	<ul style="list-style-type: none"> ✓ Energy; IP; Agri.; LUCF; Waste ✓ CO₂; CH₄; N₂O; NMVOC; ODS; SF₆
National total in 2000	<ul style="list-style-type: none"> ✓ w/o LUCF: 34.0 Mt CO₂ eq. Agriculture 67.2%; Energy 23.1%; Waste 8.3%; IP 1.4% ✓ with LUCF: -67.8 Mt CO₂ eq.
Characteristics	<ul style="list-style-type: none"> ✓ Agriculture is the major emission source; emissions from Energy also covers one-fourth of the national total.
Methodology	<ul style="list-style-type: none"> ✓ IPCC 2006 GLs ✓ Tier 1, 2 ✓ AD: Data from national statistics, etc. ✓ EF: Mostly default EFs
Uncertainty assessment	N/A
Key category analysis (Level, Top 3)	N/A
Legal basis and institutional arrangements for the GHGI	<ul style="list-style-type: none"> ✓ MOECAF is the focal point for the overall environmental management;
Improvements from INC	N/A
Improvement plan for next NC	<ul style="list-style-type: none"> ✓ Stock-taking (self-assessment) exercise for the preparation

¹ Similar summary table can be found in the Proceedings of WGIA9 (pp.13-14) for Indonesia, Malaysia, Thailand and Viet Nam. The pdf file is downloadable from "<http://www-gio.nies.go.jp/wgia/wgiaindex-e.html>".

² Information source: Presentation materials and Chapter 2 of INC of Myanmar, SNC of India, and TNC of RoK. For more detailed information of SNC of India, and TNC of RoK, see their presentation materials downloadable from "<http://www-gio.nies.go.jp/wgia/wgiaindex-e.html> (The 10th WGIA and The 11th WGIA)".

Mr. Quach Tat Quang made a presentation for progress in Viet Nam's BUR preparation. Viet Nam was preparing inventory for BUR under the project with JICA. He explained outlines of next Vietnam's BUR, which contained planned GHG estimation and mitigation action. He also stressed that Viet Nam needed support for the BUR preparation in finance, technology, and capacity building of human resources and administrative cooperation.

Ms. Tsendsuren Batsuuri made a presentation for two issues related to Mongolia's BUR preparation. She briefly introduced the policy of low carbon development including NAMAs implemented in Mongolia, explained ongoing project for BUR preparation, and stressed necessary support in capacity building for the preparation.

In the discussion, the WGIA participants actively inquired details of each presentation with great interest, and presenters answered their questions.

2.4 Session II: Introduction to the Preparation of Biennial Update Reports

This session was chaired by Mr. Kiyoto Tanabe (IPCC/TFI/TSU) and the rapporteur was Dr. Junko Akagi (GIO).

A similar topic was taken up in WGIA10 in the Session I: NC updating and discussion on WGIA- activity, where participants in WGIA10 sought clarification on the reporting requirements of NCs and BURs and related funding issues, and exchanged thoughts on how to advance work.

In WGIA11, the topic of BURs was taken up again in this session, in light of the closely approaching the first BURs⁷ submission deadline of December 2014. Representatives of international organizations shared relative information, and other examples of bilateral cooperation in the region were introduced.

Mr. Dominique Revet (UNFCCC) made an introduction to the UNFCCC Biennial Update Reporting Guidelines for Parties not included in Annex I to the Convention at the outset of the session. He gave an overview on how reporting requirements for both NCs and BURs have been enhanced over the course of the years through various COP decisions, and on elements to be covered in reporting. He also introduced supporting activities available for enhancing reporting capacities, including the SEA regional GHG Project, the Non-Annex I inventory software, user manual for the guidelines on the preparation of national communications and BURs, e-Learning programmes, CGE workshops and training materials.

Dr. Baasansuren Jamsranrav (IPCC/TFI/TSU) presented information on IPCC TFI's most recent activities. She introduced the IPCC Inventory Software, and how it could be used for reporting based on the Revised 1996 IPCC Guidelines. She also shared information on the Emission Factor Database (EFDB), from where countries can extract emission factors, if data are suitable for their specific situation. Lastly, she explained IPCC TFI's other activities such as new methodological work under way.

In addition to his first presentation, Mr. Dominique Revet (UNFCCC) also presented on the benefits for non-Annex I countries' GHG inventory experts in taking the UNFCCC review course. He explained what is currently offered in UNFCCC training programs, and the status of participation and completion. He also gave an overview on what knowledge was gained by participating in the course, and what might be the future challenges in inventory reviews.

Mr. Leandro Buendia (SEA Project) made a presentation on the SEA GHG Project and its relevant activities to support the first BUR preparation. He introduced the status of the first BUR preparation in the participating countries in the SEA Project, and how the Project was supporting the countries in order to improve institutional capacities for the establishment of sustainable inventory systems, and to develop a complete set of Tier 1 or Tier 2 emission estimates for key sectors, through tools such as the National Inventory Templates.

Mr. Hideo Noda (JICA HQs) introduced challenges for capacity development in national GHG inventories from experiences of JICA's technical cooperation projects, and Mr. Hiroshi Ito (JICA Indonesia) made an introductory presentation on capacity development for developing national GHG inventories, which was a sub-project of JICA's project of capacity development for climate change strategies in Indonesia. Mr. Noda explained that expected outcomes from the projects currently undertaken were: 1) to produce draft national GHG inventory reports as a test run, and 2) to establish systems in which data was updated periodically in reliable manner. Following Mr. Noda's presentation, Mr. Ito introduced the progress made through the sub-project in Indonesia so far, including new domestic guidelines and manuals made for inventory preparation, and pilot projects in waste sector.

Lastly, Dr. Amornwan Resanond (USAID LEAD Program) introduced their Low Emissions Asian Development (LEAD) Program, which was a capacity building program for national GHG inventories in Asia. She gave an overview of the technical assistance that the program provided for developing national systems for GHG inventory preparation and for improving inventory methods, activity data collection and documentation for key sectors, and the relevant training that they offer.

During the session, participants in WGIA11 raised questions regarding how to be consistent in their reporting of project-based emission reductions and national-level emission reductions in their BURs. They also sought clarification on reporting requirements and details of the International Consultation and Analysis (ICA) to which the BURs would be subject. Participants acknowledged that much information on ICA was still under discussion in the UNFCCC, but that enhancement of transparency would be needed.

Views were also exchanged on the various tools available, including the IPCC inventory software and the SEA Project Agriculture and Land Use (ALU) software. Additionally, the participants asked questions on the details of the various international/bilateral projects undertaken, with special interest shown regarding how to participate.

Lastly, Mr. Tanabe highlighted the forthcoming challenge of submitting the first BUR where no one has experience in, and closed the session by urging participants to consult and exchange information with each other on this matter as much as possible.

2.5 Session III: National Systems for Periodical National GHG Inventory Preparation

This session was chaired by Dr. Rizaldi Boer (Indonesia), and the rapporteur was Dr. Junko Akagi (NIES).

Mr. Kohei Sakai (NIES) made a brief introductory presentation on this session. He summarized the requirements by the UNFCCC reporting guidelines for both Annex I and non-Annex I parties and reviewed the discussion in the past WGIA's. He pointed out that sustainable national systems for preparing BURs and national GHG inventory came to be

necessary in the near future and that periodical data collection and inventory compilation with long-term and inter ministerial cooperation were important.

Dr. Sang-won Lee (Korea) reported Korea's national system and GHG inventory in 2010. Based on "The Framework Act on Low Carbon, Green Growth" enacted in 2010, Korea has improved its national system. He explained in his presentation that roles and activities of major key organizations were newly established, such as the Greenhouse Gas Inventory & Research Center of Korea (GIR), the National GHG Inventory Committee and the National GHG Inventory Management Committee. He also explained an annual schedule of inventory compilation and submission process and examples of QA/AC activities.

Mr. Mohd Famey Bin Yusoff (Malaysia) reported Malaysia's development of national GHG inventory system. In 2009, Malaysia has established its National Green Technology and Climate Change Council, which was chaired by the prime minister of Malaysia and was responsible for formulating policies and identifying strategic issues in green technology and climate change development. He also explained improvements in Malaysia's second NC from its INC and planned future improvements, such as the National Corporate Reporting Program (MyCarbon) on voluntary basis, by which more data submission from industries than present would be expected.

Ms. Wasinee Wannasiri (Thailand) reported development and history of Thailand's national system. She explained institutional framework for Thailand's SNC, along with difficulties experienced through the development. She also explained that critical elements for efficient and high quality GHG inventory system more than present were information neutral standardization system, national database, and information collecting guideline and protocol. She also explained the Spatial GHG Inventory Program developed for calculating GHG emissions and removals in AFOLU Sector as an example of improvement.

Ms. Elsa Hatanaka (Japan) reported development of Japan's National System. She explained requirements of the UNFCCC and the Kyoto Protocol, Japan's legal basis for inventory preparation, Japan's institutional arrangement and its historical changes, tasks of the GIO, inventory improvement process and annual inventory compilation schedule in Japan. She concluded at the end of her presentation that organizing a national system for inventory compilation took a long time but was a necessary element for periodical national GHG inventory preparation, and that it ensured time-series consistency and effective compilation of the inventory.

Through questions and answers in this session, the most remarkable questions were regarding roles and activities of organizations for GHG inventory compilation in each presenting country, such as Korea's GIR. Moreover, other remarkable questions in the session were regarding new activities such as Malaysia's MyCarbon program and Thailand's Spatial GHG inventory program. This session was very informative and supposed to be good references for coming BUR preparation of all attending countries.

2.6 Session IV: Relationships between National GHG Inventories and Mitigation Measures/NAMAs

This session was chaired by Mr. Takahiko Hiraishi (IGES) and the rapporteur was Dr. Junko Akagi (GIO).

This session dealt with relationship between national GHG inventories and mitigation measures, specifically NAMAs. A similar topic was once treated at WGIA9³, taking into account the comments made by participants in WGIA8, namely the importance of expanding the WGIA activities to enhance the usefulness of the inventories, such as activities to link inventories to mitigation planning and policy-making support. At WGIA9, the following points were shared with participants:

- Inventory could be used as a basis for developing mitigation measures and for evaluating the effects of mitigation measures being implemented, if it was appropriately compiled;
- Difference in scales needed to be considered: inventory data were often collected at a national level, while mitigation data were done at a local level;
- Care needed to be taken in using inventory methodologies for mitigation planning and implementation so as to avoid unsound overestimation of mitigation effects;
- Inventory compilers and those who developed mitigation measures were recommended to strengthen their cooperation in order to assure close linkage between inventories and mitigation measures.

In WGIA11, this session dealt with the same topic mentioned above in order to discuss possibility of inventories as a supporting tool for sustainable mitigation measures and NAMAs. Representatives of Japan and Australia shared their experiences in using their national GHG inventories for supporting mitigation actions for achieving the targets under the Kyoto Protocol (KP). In addition, representatives of Indonesia and Thailand introduced their challenges and limitations to reflect the effect of mitigation actions to inventories.

Mr. Takashi Morimoto (Japan) introduced two approaches to check progress of mitigation actions and measures to meet Japan's KP target; one is "Factor Analysis of GHG emission trends" and the other is "Progress Evaluation of the Kyoto Protocol Target Achievement Plan". These two approaches supported Japan's sustainable implementation of mitigation actions and measures. He also pointed out that improving the inventory through obtaining more accurate data and research activities could have positive spill-over effects to a wide range of policy fields.

Dr. Renée Kidson (Australia) shared Australia's experience in using the national GHG inventory for measuring the effect of mitigation. There were "Australian Greenhouse Emissions Information System (AGEIS)" and a mandatory company reporting National Greenhouse & Energy Reporting (NGER) legislation, which supported Australia's mitigation actions by enhancing transparency and completeness of reporting. She mentioned that Australia was interested in engaging Asian partners and sharing experiences to support MRV of NAMAs.

Mr. Dida Migfar Ridha (Indonesia) reported Indonesia's challenge on developing GHG inventory and mitigation measures. He explained that Indonesia has just started implementing its Presidential Decrees No. 61/2011 on its national action plan for reducing GHG emissions, and No. 71/2011 on conducting national GHG inventories. He also explained Indonesia's achievement on the decrees, which included guidance on national GHG inventory preparation and that for developing GHG reduction action plans as well as capacity building for local governments on GHG inventory preparation and GHG modeling on future forecasting. Moreover, He reported that the Government of Indonesia was developing its national MRV system under the Ministry of Environment, while design of the MRV system was still under

³ Proceedings of WGIA9: <http://www-gio.nies.go.jp/wgia/wg9/pdf/wgia9%20proceedings.pdf>

discussion within stakeholders.

Mr. Chessada Sakulku (Thailand) reported current status of Thailand in relationship between the inventories and mitigation measures. Thailand has been preparing its first BUR and TNC. He explained that priorities were given to set up a national system that made it possible to collect adequate data for the country, and to improve completeness in order to reflect the effect of mitigation measures in its national GHG inventories. For that, he pointed out that Thailand's data reporting system needed to be further enhanced, and its data reconciliation from different data sources needed to be considered.

Through discussions in this session, participants in WGIA11 reached a conclusion that good inventory systems could provide fundamental methodologies, core data and valuable insights for mitigation planning and post-facto evaluation, notably for future baseline/reference level projection and estimation of emission reductions from planned mitigation actions. However, current inventory and statistics system might not provide higher Tier methods and emission factors, or detailed data for disaggregated sectors that were often required for, in particular, sub-national, local or sector level mitigation planning and actions. On the other hand, mitigation planning required detailed projection, monitoring and verification. Thus, new methodologies, experiences and data, which have been or might be generated in mitigation actions, such as those large number of CDM methodologies and data. These might, in turn, provide highly disaggregated activity data and emission factors that might be useful for inventory compilers, though due caution was required to their differences (national GHG inventories were made at national level, and use of project-level data might cause bias in them.) Thus, close collaboration between inventory experts and mitigation planners would be highly beneficial to both of them.

As a result, this session re-confirmed the importance of inter-ministerial collaboration for NAMA, BUR, and NCs, and also suggested to consider initiating regional/sub-regional sharing of new experiences among WGIA colleagues, including successes and difficulties in the collaboration of inventory experts and mitigation planners.

2.7 Session V: Enhancement of Network for Supporting Measurement, Reporting and Verification at Various Levels

This session was chaired by Dr. Sirintrntheep Towprayoon (Thailand), and the rapporteur was Ms. Takako Ono (GIO).

The purposes of this session are:

- To explore activities on measurement, reporting and verification (MRV) at various levels,
- To exchange information on barriers against achieving MRVs,
- To discuss how to overcome the barriers, and
- To share information on and network for supporting activities for various MRVs.

Key points for MRV discussed in this session are priorities of establishing MRV at various levels, challenges of MRV implementation, understanding of MRV procedures, institutional arrangement for mobilizing MRVs, policy involvement for enhancing MRV actions, and examples on MRV actions.

Dr. Shuzo Nishioka (LoCARNet, Japan) reported a forecast that GHG emissions from

Asian countries would increase to 50% of the world total GHG emissions by 2050 and emphasized the importance of actions towards low-carbon development in Asia. He explained activities by the LoCARNet and mentioned a possibility of Asian countries' leapfrogging to low carbon societies with growth of Gross Domestic Product (GDP). He also mentioned that more precise inventory fitting to a country's situation was necessary as a base of NAMAs and MRV.

Dr. Junichi Fujino (AIM, Japan) provided information on concepts of NAMAs and MRV, including national and sub-national NAMA studies by AIM simulations. He mentioned that comprehensive understanding of NAMAs and MRV at various levels, such as project-based bottom-up approach and policy-based top-down approach, was an important challenge. He also explained that AIM was a simulation model to support designing sustainable societies and identifying suggested actions for GHG emission reduction and removal enhancement and introduced a procedure to develop low carbon development strategies by utilizing the AIM model.

Mr. Kazuhisa Koakutsu (IGES, Japan) introduced a MRV guidebook, which was prepared by experts on MRV at national, municipal and project levels. He explained that objectives of the MRV guidebook were to summarize various existing MRV schemes and to promote understanding of MRV from national level, such as national GHG inventories, to project level as the Clean Development Mechanism (CDM) activities. He also explained the schedule of preparing and improving the MRV guidebook and mentioned that comments and feedbacks from the participants in WGIA11 were very welcomed.

Mr. Makoto Kato (OECC, Japan) made a presentation on experiences of designing NAMAs in a MRV manner in Asia, which is a bottom-up approach taken in the Ministry of the Environment of Japan (MOEJ) and OECC capacity building activities. He explained that a NAMA guidebook was prepared by compiling experiences of developing NAMAs in Asian countries and mentioned that MRV was an important element of NAMAs in order to understand actual past GHG emissions and future business-as-usual (BAU) GHG emissions, and to identify quantitative goals and progress indicators for NAMAs.

Dr. Akio Takemoto (IGES and APN, Japan) reported roles of GHG inventories in small and medium industries for enhancing NAMAs in the context of sustainable development in India. He explained contents of a research activity for application of low carbon technology for sustainable development in India, which was supported by the Science and Technology Research Partnership for Sustainable Development (SATREPS). He mentioned that small and medium industries played a key role in economic growth in India as well as other developing countries and stated that technological cooperation for enhancing MRV of the small and medium industries was important for implementing NAMAs in developing countries. He also provided information on supporting activities provided by the Asia-Pacific Network for Global Change Research (APN) and expressed that application to the supporting activities by the APN was welcomed.

Mr. Toshihiko Kasai made a presentation on importance of GHG inventories for ensuring emission reduction through technology deployment. He mentioned that low carbon technologies would contribute not only to energy security and GHG emission reduction but also to development and growth of economy. He also explained basic concepts of the joint crediting mechanism (JCM) and mentioned that JCM was an effective approach to disseminate low carbon technologies with considering each country's circumstances. Moreover, he stated that GHG inventory experts were crucial in structuring MRVs suitable

for each country's characteristics, which was an important factor in facilitating and introducing low carbon technologies.

Dr. Osamu Bannai provided information on efforts to draft MRV methodologies on JCM as an example of MRV at project level. After presenting an overview and case studies of JCM, he mentioned that simple and practical draft MRV methodologies for JCM have been developed, including default emission factors by measuring model project and streamlined monitoring items for reducing monitoring burdens, such as remote monitoring. He also mentioned that capacity building on MRV for local project participants and local verifiers was necessary because emission reductions by JCM were measured and reported by the local project participants and verified by the local verifiers.

Through presentations and discussions in this session, the participants in WGIA11 got the following outputs on the MRV issues:

- Cross cutting:
 - Contents of measurement, reporting and verification (MRVs) would be different for each level, such as national, sub-national, and project levels, and we should try to clarify the differences for actual implementation of each MRV.
 - Clarification of the differences of MRVs needed contribution from many experts at various levels.
 - Guidebooks on MRVs and NAMAs would be useful for people who were not familiar with these issues.
 - MRV for mitigation actions should be elaborated.
- NAMA level:
 - How to verify NAMAs depended on national circumstances and level of categories, such as unilateral, supported, policy-level and project-level.
 - Transparency on methodologies of the MRVs for various NAMAs was important for clarifying contents of the MRVs.
 - Information sharing was effective to enhance capacity for NAMAs and to develop actual MRV methodologies on various NAMAs.
- Project level:
 - When a project was shifted from a credit system to another system, it was important to follow the MRV procedure for the new credit system.
 - Simple and practical MRVs was important for project level because local verifiers might not deal with complicated MRVs.

2. Workshop Report

3. Abstracts

3. Abstracts

3.1 Opening Session

Overview of WGIA11

Naofumi Kosaka

Greenhouse Gas Inventory Office of Japan (GIO/CGER/NIES), Japan

Abstract

NAI Parties under the United Nations Framework Convention on Climate Change (UNFCCC) are required to prepare Greenhouse Gas (GHG) inventories as a part of National Communications (NCs) and Biennial Update Report (BURs) to be periodically submitted to the Conference of the Parties (COP) under the UNFCCC. The importance of reliable GHG inventory and its further improvement has been continuously considered in the international negotiation process, as it is the key to the evaluation of Nationally Appropriate Mitigation Actions (NAMAs).

The Workshop on GHG Inventories in Asia (WGIA) organized by the Ministry of the Environment of Japan (MOEJ) and the National Institute for Environmental Studies (NIES) has been held on an annual basis since 2003. The workshops have always aimed at supporting Non Annex I (NAI) Parties in Asia to develop and improve their GHG Inventories. Since the 6th session, the WGIA has been held as a capacity building workshop for measurability, reportability and verifiability (MRV) by taking into account the G8 Environment Ministers' Meeting in Kobe (May 2008). At the 10th session, in order to run the workshop in a more efficient manner, the draft Terms of reference (TOR) and the establishment of Organizing Committee (OC) and Advisory Board (AB) were proposed, and the final TOR will be shared at the WGIA11.

The upcoming 11th Workshop on GHG Inventories in Asia (WGIA11) is to be held 5-7 July 2013 in Tsukuba, Japan. WGIA11 is organized in accordance with the TOR and the comments received from the members of OC and AB are reflected in this 11th workshop agenda items. The WGIA11 aims at: 1) enhancing sector-specific capacity for inventory compilation, 2) facilitating periodical national GHG inventory preparation for NCs and BURs, 3) discussing the possibility of inventories as a supporting tool for mitigation measures/NAMAs, and 4) exploring issues on MRV at various levels.

Over 130 participants are expected to be present in this 11th workshop. Participants are government officials and researchers from 14 countries in Asia (Cambodia, China, India, Indonesia, Japan, Republic of Korea, Lao P.D.R., Malaysia, Mongolia, Myanmar, Philippines, Singapore, Thailand and Viet Nam) and are experts from international organizations (UNFCCC, Technical Support Unit of the IPCC Task Force on National GHG Inventories (IPCC/TFI/TSU), the Regional Capacity Building Project for Sustainable National GHG Inventory Management Systems in Southeast Asia (SEA GHG Project), the United States Agency for International Development (USAID), and the Department of Industry, Innovation, Climate Change, Science, Research and Tertiary Education of the Australian Government (DIICSTRE)).

References

G8 Environment Ministers' Meeting, 2008. Chair's Summary G8 Environment Ministers Meeting, Kobe, Japan, May 24-26, 2008, 1-11. (<http://www.env.go.jp/en/focus/attach/080610-a2.pdf>)

Access to relevant information

<http://www-gio.nies.go.jp/wgia/wgiaindex-e.html>

3.2 Session I

The progress of preparing BUR in Viet Nam

Quach Tat Quang
*Ozone Layer Protection Center,
Department of Meteorology, Hydrology and Climate Change, Viet Nam*

Abstract

Vietnam has signed UNFCCC on 11th June 1992, and ratified on 16th Nov 1994; signed the KP on 3rd Dec 1998 and ratified on 25th Sep 2002. Viet Nam had done two National Communications to the UNFCCC including Viet Nam Initial National Communication and Vietnam's Second National Communication.

Recently, Prime Minister approved Decision No. 1775/QĐ-TTg 21 November 2012 on Plan of GHG emission management; management of carbon trading activities to the world market in which Viet Nam will carry out the biennial inventory.

Viet Nam is implementing the project: "Capacity building for National GHGs inventory" in which the national inventory for year 2005 and 2010 will be done.

Base on those above, Viet Nam would like to make a first Biennial Update Report (BUR) to UNFCCC by 2014. Viet Nam is now connecting to UNEP to get support as sponsor for the first BUR and the third National Communication also.

For the first BUR, Viet Nam is now preparing the outline of BUR. In principle, the contents of BUR comply with the methodologies established by the latest UNFCCC guidelines for the preparation of national communications from non-Annex I Parties approved by the Conference of the Parties (COP) or those determined by any future decision of the COP on this matter. The contents of BUR also base on what they have in National Communication. The draft of outline of BUR will be finalized after getting comments from stakeholder.

The presentation is to present about what Viet Nam is doing for the first BUR. It includes four main contents as follow:

1. Background: this part is to give out the legal framework and Viet Nam's situation which involve with BUR
2. The progress of preparing BUR: this part is to lay the contents which includes in the BUR and it is presented in four items as follow:
 - National circumstances and institutional arrangements
 - National greenhouse gas inventory: in this item there are the summary information tables of inventories for previous submission years (for the year 1994 and 2000) and the summary of national inventory report or an update of the information which imitate the chapter III of the annex to decision 17/CP.8, including table 1 and table 2. However, Table 2 will not be done because Vietnam does not inventory for HFCs, PFCs and SF₆ due to lack of information and data. The scope of sectors to be reported in Vietnam National GHG inventory is energy, agriculture, industrial process, LULUCF, waste.
 - Mitigation action
 - Finance, technology and capacity-building needs and support received
3. The gaps for the preparation
4. Necessary supports for the preparation

References

- Decision 2/CP.17 (Paragraph 39-42 and Annex III)
Decision 17/CP.8 (Paragraph 8-24)
Good Practice Guidance for Land Use, Land Use Change and Forestry (Annex 3A,2)
Viet Nam's Second National Communication to UNFCCC

Progress, Barriers and Necessary Supports for Preparing Mongolia's first Biennial Update Report

Ms. Tsendsuren Batsuuri

Ministry of Environment and Green Development, Mongolia

Abstract

Mongolia, as a non-Annex 1 country party to the United Nations Framework Convention on Climate Change (UNFCCC), has submitted its Nationally Appropriate Mitigation Actions (NAMAs) list in 2010. Mongolian NAMAs includes broad set of actions in 6 sectors ranging from energy supply to forestry. All the actions included in its submission are envisioned to be implemented to certain extent with international support on capacity building, technology transfer and financing. As one of the conditions in the negotiation, to get international support, Mongolian NAMAs has to be measurable, reportable and verifiable according to international standards. In this regard, Mongolia is looking at various options to implement its NAMAs including but not limited to use of carbon market mechanisms such as Clean Development Mechanism (CDM) and various new market mechanisms that are emerging. Since the start of CDM, Mongolia have, so far, 4 projects and 1 program of activities registered as CDM projects which are in the field of renewable energy and energy efficiency. Mongolia has also recently established Low Carbon Development Partnership with Japan to implement Joint crediting mechanism, a bilateral offset credit mechanism.

Furthermore, Mongolian Government is keen on reducing GHG emissions not only with international support but also with its domestic effort. In the draft concept note and midterm program for Green Development prepared by the Ministry of Environment and Green Development (MEGD), which has been discussed at the Cabinet in June, 2013 and from there decided to be submitted to the Parliament for its approval, targets had been proposed such as to increase share of Renewable energy in the total installed capacity to 30% by 2030 and to reduce CO₂ emission per GDP 2.5 times compared to 2006 by 2030.

Mongolia has submitted its first and second National Communication (NC) to the UNFCCC in 2001 and 2010 respectively and it is planning to start preparation of its 3rd NC by late 2014 or early 2015. MEGD as the main responsible organization for reporting on the actions taken by Government of Mongolia in meeting its commitments and obligations under UNFCCC will supervise the preparation of 3rd NC. In addition, MEGD is also planning to start preparation of Mongolia's first Biennial Update Report (BUR) to be submitted as stand-alone update report. Due to lack of national funding currently available for these works, MEGD is preparing to apply for funding to the Global Environment Facility (GEF) for its 3rd NC and the first BUR. Since it's the first time Mongolia is submitting its BUR, capacity building will be crucial at the institutional and individual level. At the institutional level, assistance and guidance on establishing proper network and database for information sharing on NAMAs implementation, recording and reporting of mitigation actions taken, emission reductions achieved as well as supports received will be necessary, while at the individual level, capacity building to improve knowledge and strengthen understanding on BUR, guidelines and methodologies to be used will be necessary. This initial capacity building is especially important for establishing foundation of strong institution with capable human resource that is able to coordinate implementation of NAMAs in the country and prepare the update report in every two years (BUR) in a consistent and coordinated manner.

References

Nationally appropriate mitigation actions of Mongolia submitted to UNFCCC
Cancun Agreement (1/CP.16) paragraph 61.
Mongolia's green development concept note and midterm program (draft)

Access to relevant information

http://unfccc.int/files/meetings/cop_15/copenhagen_accord/application/pdf/mongoliacphaccord_app2.pdf

<http://cdm.unfccc.int/Projects/projsearch.html>

http://cdm.unfccc.int/ProgrammeOfActivities/poa_db/QF6PYE8DBOKW1UC7TV549023AGL_ZXN/view

<http://mmechanisms.org/e/initiatives/index.html#mongolia>

http://unfccc.int/national_reports/non-annex_i_natcom/items/2979.php

<http://maindb.unfccc.int/public/country.pl?country=MN>

3.3 Session II

Introduction to the UNFCCC Biennial Update Reporting Guidelines for Parties not included in Annex I to the Convention

Dominique Revet
UNFCCC secretariat

Abstract

COP 17 adopted the guidelines for the preparation of biennial update reports from non-Annex I Parties contained in annex III of decision 2/CP.17, and also decided the following:

- (a) That non-Annex I Parties, consistent with their capabilities and the level of support provided for reporting, should submit their first biennial update report by December 2014; the least developed country Parties and small island developing States may submit biennial update reports at their discretion;
- (b) That in using the Guidelines, non-Annex I Parties should take into account their development priorities, objectives, capacities and national circumstances;
- (c) That the Guidelines should be used as a basis to provide guidance to an operating entity of the financial mechanism for funding the preparation of biennial update reports from non-Annex I Parties and, in the case of the first biennial update report, to the Global Environment Facility;
- (d) To urge non-Annex I Parties to submit their requests to the Global Environment Facility for support, in a timely manner;
- (e) That enhanced support for the preparation of biennial update reports should be ensured by developed country Parties and other developed Parties included in Annex II to the Convention by means of resources, in accordance with Article 4, paragraph 3, of the Convention, on the basis of agreed full-cost funding;
- (f) That non-Annex I Parties shall submit a biennial update report every two years, either as a summary of parts of their national communication in the year in which the national communication is submitted or as a stand-alone update report; the least developed country Parties and small island developing States may submit biennial update reports at their discretion;
- (g) That the first biennial update report submitted by non-Annex I Parties shall cover, at a minimum, the inventory for the calendar year no more than four years prior to the date of the submission, or more recent years if information is available, and that subsequent biennial update reports shall cover a calendar year that does not precede the submission date by more than four years;
- (h) That these guidelines should be reviewed and revised as appropriate, in accordance with decisions of the Conference of the Parties.

Access to relevant information

<http://unfccc.int/resource/docs/2011/cop17/eng/09a01.pdf#page=39>

http://unfccc.int/national_reports/non-annex_i_natcom/guidelines_and_user_manual/items/2607.php

http://www.thegef.org/gef/guideline/biennial_update_reports_parties_UNFCCC

IPCC TFI: Recent Activities

Baasansuren Jamsranjav

IPCC TFI TSU

Abstract

The TFI develops and promotes the IPCC guidelines and relevant tools for the estimation and reporting of national greenhouse gas emissions and removals.

It produced new inventory software (IPCC Inventory Software) in 2012 to assist countries in compilation, documentation and archiving national GHG inventory. The software is based on the 2006 IPCC Guidelines for National Greenhouse Gas Inventories. However, it can also be used for reporting under the earlier Revised 1996 IPCC Guidelines.

The work on enhancement and improvement of the IPCC Emission Factor Database (EFDB) has been progressing with editorial board meetings as well as data collection meetings and activities. User-interface of the EFDB is being further improved.

The TFI is continuing its other activities supporting users of the IPCC Guidelines and IPCC Inventory Software, and contributing to inventory-related capacity building programmes providing technical expertise as well as inventory-related materials developed by the IPCC TFI.

The TFI is now developing two methodological reports in response to the invitation from UNFCCC, “2013 Supplement to the 2006 IPCC Guidelines for National Greenhouse Gas Inventories: Wetlands” and “2013 Revised Supplementary Methods and Good Practice Guidance Arising from the Kyoto Protocol”, with the aim to complete this work by October 2013.

Access to relevant information

<http://www.ipcc-nggip.iges.or.jp/>

Beneficial certificate for non-Annex I inventory compilers to enhance capacities of GHG inventory preparation: a certificate of UNFCCC reviewer for Annex I countries' GHG inventories

Dominique Revet
UNFCCC secretariat

Abstract

The secretariat is providing training courses for the inventory experts; a basic course for the review of GHG inventories of Annex I Parties under the Convention, and the course for the review under the Kyoto Protocol. All online modules of those courses can be made available for the inventory experts nominated by their governments. Those who passed the final examinations of mandatory courses will receive certificates of those courses. The current expert review teams (ERT) of the Annex I inventory reviews under the Convention and the Kyoto Protocol consist of experts who passed those examinations.

The basic course provides overview of the UNFCCC review and the IPCC inventory Guidelines and the sector specific modules. Expert can choose one or more sectoral modules in accordance with his/her own expertise. To complete the basic course, participants are invited to a hands-on training seminar of the inventory review exercise.

Above training activities are expected to;

- Provide fundamental technical knowledge and strengthen skills of ERTs' members;
- Improve the effectiveness, efficiency and consistency of reviews;
- Contribute to enhance quality of Annex I Parties inventories;
- Contribute to improve GHG inventories in non-Annex I Parties through the participation of their experts in the training and in subsequent reviews.

For the fourth point of capacity-building, regional training seminars targeting non-Annex I experts are held, when funds available, in addition to the annual training seminar. With such efforts, the number of non-Annex I experts participation to training activities in 2009-2012 were more than double the number of Annex I experts.

However, when looking the pass rates of examinations, the situation is reversed. In 2012, the pass rate of the non-Annex I experts for the basic course was 54%, while 95% of Annex I experts passed the examinations. Reasons behind could include difference in the profiles of the Annex I and non-Annex I inventories, writing skills in English, business with multiple assignments, etc. In addition, geographical representation of the ERT members still needs to improve; e.g., in 2012, 62% was from Annex I Parties, and 38% from non-Annex I Parties. More inventory experts from non-Annex I Parties are encouraged to take the training courses and pass the examination.

Access to relevant information

http://unfccc.int/national_reports/annex_i_ghg_inventories/inventory_review_training/items/2763.php

The SEA GHG Project and its Relevant Activities to Support BUR1 Preparation

Leandro Buendia

SEAGHG Project Coordinator, Philippines

Abstract

COP17 in Durban decided that Non-Annex I Parties, consistent with their capabilities and level of support provided for reporting, should submit the First Biennial Update Report (BUR1) by December 2014, including a GHG inventory no less than 4 years old. The BUR should contain, among others, information on national GHG inventory, as well as domestic measurement, reporting, and verification (MRV).

Countries participating in SEA GHG Project Phase 2 are Cambodia, Malaysia, Papua New Guinea, the Philippines, Thailand, and Viet Nam. Most of these countries will prepare their BUR1. Using template workbook for National GHG Inventory and inventory tools, the SEA GHG Project is helping these countries to improve the institutional capacity to establish a sustainable national GHG inventory system, and to develop a complete Tier 1 or Tier 2 for key sectors, in support of developing its Third national Communication (NC3) and BUR1. The Project provides technical assistance on methods, activity data collection, and documentation towards completing national GHG inventories that are transparent, accurate, consistent, complete and comparable (TACCC).

The National Template Workbook is an easy-to-use workbook that condensed the key elements of the IPCC Guidelines and UNFCCC guidance for institutional arrangements (IA), method and data documentation (MDD), quality assurance and quality control (QA/QC), archiving, key category analysis (KCA), and national inventory improvement plan (NIIP). The Agriculture and Land use (ALU) Software and Workbook is a user-friendly tool for estimating GHG emissions and removals in AFOLU sector, consistent with the IPCC methodology. The National Template Workbook and ALU Software generate detailed inventory reports in a TACCC way and also support domestic MRV.

The SEA GHG Project has been working with countries since 2011 in the form of planning and technical meetings, follow up technical workshops, informal consultations, and technical working sessions in small teams. Countries find the National Template Workbook and ALU Software useful in building institutional capacity and implementing IPCC methodology. They facilitate effective organization and management of GHG inventory.

There are gaps, barriers, and challenges in institutional arrangements, in the availability of data for Tier 2, with limited resources, and the quick turn over of people. The SEA GHG Project will continue its activities in addressing these issues with participating countries, with a Mid-Term Review in October 2013, and continuing till its project completion in September 2014.

Access to relevant information

U.S. EPA Inventory Preparation Tools:

www.epa.gov/climatechange/EPAactivities/internationalpartnerships/capacity-building.html

Challenges for Capacity Development in National GHG Inventory Experiences of JICA's Technical Cooperation

Hideo Noda

*Director of Environmental Management Division 1, Global Environment Department,
Japan International Cooperation Agency (JICA), JAPAN*

Hiroshi Ito

*Expert of GHG Inventory, Project of Capacity Development for Climate Change Strategies in
Indonesia, Japan International Cooperation Agency (JICA), JAPAN*

Abstract

(1) JICA's approach to support development of GHG Inventory

Two (2) technical cooperation projects of JICA are ongoing in the field of capacity development for GHG inventory: in Vietnam (2010-2014) and in Indonesia (2010-2015). These Projects aim at establishing systems in which accurate and reliable national GHG inventories are prepared and updated periodically through 'test run' in producing actual national GHG inventory reports. Major challenges are institutional arrangement (legal framework) and collaboration among related ministries/agencies, availability and quality of necessary data/statistics, and overall management and coordination of national GHG inventory processes. Political initiative and strong commitments of related stakeholders at national levels are essential for tackling these challenges. Utilization of GHG inventory data for elaborating refined scenarios of mitigation with a view to creating improved and detailed NAMA actions at national/regional levels is now another challenge.

(2) Capacity Development for National GHG Inventories in Indonesia

The Project has been implemented since 2010 until 2015 with its objective to promote policies and actions related to climate change issues in Indonesia. This Project consists of the three Sub Project. Sub-Project 3 is "The Project of Capacity Development for Developing National GHG Inventories" with the Ministry of Environment (KLH). (Sub Project-1 is for mainstreaming mitigation and adaptation in development policies, and the Sub-Project 2 is for vulnerability assessment.)

Presidential Degree 71/2011 has set the foundation for Indonesian GHG inventories. This project has supported KLH to publish guidelines for preparing national GHG inventories and step-by-step manuals for all sectors in inventory. Also, pilot activities have been conducted to enhance the capacity to develop the GHG inventory at local levels. The results of the survey in the pilot sites have provided useful data for planning of mitigation actions in other provinces, and also at the national level.

Access to relevant information

<http://www.jica.go.jp/index.html>

<http://www.greenclimateproject.org/>

USAID Low Emissions Asian Development (LEAD) Program: National GHG Capacity Building in Asia

Amornwan Mai Resanond, Ph.D
LEAD, Thailand

Abstract

The U.S. Agency for International Development (USAID) is committed to helping developing countries pursue sustainable economic development and improve living standards worldwide. Low-carbon, climate-resilient development, commonly described as “green growth”, is viewed as the most effective means of meeting these objectives. Low emission development strategies, or LEDS, provide strategic planning, analytical, and policy processes to promote economic growth while achieving significant, long-term emission reductions in key sectors.

USAID’s regional Low Emissions Asian Development (LEAD) program helps Asian governments, businesses, and institutions develop frameworks for sustained low-carbon development across all economic sectors. This five-year program is designed to build capacity in LEDS development and implementation, greenhouse gas (GHG) inventories, and carbon market development in up to 11 countries: Bangladesh, Cambodia, India, Indonesia, Laos, Malaysia, Nepal, Papua New Guinea, Philippines, Thailand, and Vietnam. LEAD complements the U.S. Government’s global initiative for enhancing capacity of LEDS, and draws on specialized expertise from the U.S. Department of Energy (USDOE), U.S. Environment Protection Agency (USEPA), and U.S. Department of Agriculture’s Forest Service (USDA/FS).

LEAD takes a regional approach in facilitating cooperation and knowledge-sharing, building capacity, replicating best practices, and encouraging public-private partnerships. This program is demand-driven and tailors its activities to specific country circumstances. LEAD supports the adoption of low-carbon policies, plans, and practices and enhanced human and institutional capacity in four interrelated areas: LEDS development and implementation, GHG inventories and accounting, carbon market development, and regional cooperation.

The presentation will cover an introduction to the LEAD program, and capacity building activities related to GHG inventory development in Asia.

References

LEAD Program factsheet

Access to relevant information

Website: www.LowEmissionsAsia.org

Facebook:

<https://www.facebook.com/pages/USAID-LEAD-Program/315645465222017?ref=hl>

3.4 Session III

Korea's National System and GHG Inventory in 2010

Dr. Lee, Sang-won

Korea Environment Corporation (KECO), Republic of Korea

Abstract

The national greenhouse gas (GHG) inventory was published by the Ministry of Trade, Industry & Energy (MOTIE) in accordance with Article 19 of the *Energy Act* before 2010. The *Framework Act on Low Carbon, Green Growth* enacted in 2010, designated the Ministry of Environment as the representative body in charge of the national GHG inventory. As the Act states the principles, roles and system of GHG inventory management and the establishment of the Greenhouse Gas Inventory and Research Center of Korea (GIR), it fortifies the foundation for a transparent and efficient national GHG inventory system.

The national GHG inventory preparation procedures are described as follows.

First, GIR provides the guidelines for Measurement, Reporting, and Verification (MRV) for the National GHG Inventory, which have been approved by the National GHG Inventory Committee by the end of February to relevant ministries to prepare the national GHG inventory. GIR revises the previous year's MRV guidelines reflecting verification results derived during the preparation of National Inventory Report (NIR) and Common Reporting Format (CRF) every year. Agencies in each sector designated by the relevant ministries must prepare their part of the GHG inventory following the approved guidelines. The relevant ministries gather and submit them to the GIR by June 30th.

The NIR and CRF submitted by relevant ministries are verified by GIR which is responsible for preparing the verification report based on the verification results. GIR's experts review the NIR and CRF for each sector; and if necessary, they may be reviewed by outside experts who did not participate in the initial preparation of the GHG inventory by the relevant ministries. Each Ministry must submit the NIR and CRF, revised by themselves reflecting verification result, to GIR by the end of October. After the National GHG Inventory Committee completes the final review of the NIR and CRF, with the technical review of the National GHG Inventory Technical Group and consultation of the National GHG Inventory Management Committee, the results are published in December.

Total GHG emissions were 668.8 Mt CO₂ eq. in 2010, representing a 9.8 percent increase from 2009. Total GHG emissions consisted of the following sectors: 85.3 percent from the energy sector, 9.4 percent from industrial processes, 3.2 percent from agriculture, and 2.1 percent from the waste sector. The share of CO₂ in the total GHG emissions in 2010 was 89.1 percent, followed by 4.2 percent of CH₄, 2.9 percent of SF₆, 2.1 percent of N₂O, 1.2 percent of HFCs, and 0.4 percent of PFCs. Compared to the levels in 2009, CO₂, and N₂O emissions increased by 10.0 percent and 3.9 percent, and CH₄ emissions increased by 4.7 percent. Emissions of HFCs and SF₆ increased by 38.8 percent and 6.0 percent, and PFCs emissions increased by 17.4 percent.

References

Korea's Third National Communication under the United Nations Framework Convention on Climate Change

Development of National GHG Inventory System: The Malaysia Experience

Mohd Famey Bin Yusoff
Department of Environment, Malaysia

Abstract

Malaysia ratified the UNFCCC in 1994 and the Kyoto Protocol in 1999. In 2000, the Initial National Communication (INC) was submitted to the UNFCCC followed by the Second National Communication (SNC) in 2011. Acknowledging the importance of climate change issues, Malaysia has established The National Green Technology and Climate Change Council (NGTCCC) in 2009. The council is chaired by the Hon. Prime Minister of Malaysia and the council is responsible in formulating policies and identifying strategic issues in green technology and climate change development. The council also coordinates, monitors and evaluates the effectiveness of the climate change policy and programmes at national level. The National Climate Change Policy was published in 2009 and it provides the framework to mobilise and guide government agencies, industry, community as well as other stakeholders and major groups in addressing the challenges of climate change in a holistic manner. The National Climate Change Policy will enable Malaysian to take concerted actions and identify opportunities that can help navigate the nation towards sustainability. There are five working groups in the GHG Inventory process and the group is coordinated by a federal agency. The working group is responsible in collecting, analysing and reporting the GHG Inventory for preparation of National Communication. The working group also advises and recommends improvement for the preparation of national GHG inventory. Main improvements made in the SNC compare to INC was the inclusion of new key categories in the industrial processes and products use (IPPU) and LULUCF sector and the use of Revised IPCC 1996 Guidelines and GPG 2000. Malaysia is currently preparing her Third National Communication and is using the latest IPCC 2006 Guidelines.

References

1. Malaysia Initial National Communication, 2000
[http://www.nre.gov.my/Malay/Alam-Sekitar/Documents/Penerbitan/Initial%20National%20Communication%20\(INC\).pdf](http://www.nre.gov.my/Malay/Alam-Sekitar/Documents/Penerbitan/Initial%20National%20Communication%20(INC).pdf)
2. National Policy on Climate Change, 2009
http://www.nre.gov.my/Malay/Alam-Sekitar/Documents/Dasar/NCCP_080710_for-web.pdf
3. Malaysia Second National Communication, 2011
[http://www.nre.gov.my/Malay/Alam-Sekitar/Documents/Penerbitan/SECOND%20NATIONAL%20COMMUNICATION%20TO%20THE%20UNFCCC%20\(NC2\).pdf](http://www.nre.gov.my/Malay/Alam-Sekitar/Documents/Penerbitan/SECOND%20NATIONAL%20COMMUNICATION%20TO%20THE%20UNFCCC%20(NC2).pdf)

Development and History of Thailand's National System

Ms. Wasinee Wannasiri

Greenhouse Gas Information Center

Thailand Greenhouse Gas Management Organization (Public Organization)

Abstract

Thailand submitted the Initial National Communication (INC) in year 2000, following the 1996 IPCC Revised Guidelines. The INC set out Thailand's contribution to international efforts to address climate change issues and provided an overview of national circumstances that influence Thailand's capacity to respond and described its greenhouse gas inventory in the year 1994 and mitigation options. Office of Environmental Policy and Planning (OEPP) under Ministry of Science, Technology and Environment commissioned Kasetsart University to prepare the INC. For the Second Communication (SNC) of Thailand, under the policy guidance from the National Climate Change Committee (NCCC), the project was carried out by Office of Natural Resources and Environmental Policy and Planning (ONEP) and Thailand Greenhouse Gas Management Organization (TGO) under Ministry of Natural Resources and Environment. King Mongkut's University of Technology Thonburi (KMUTT) was commissioned by ONEP and TGO to prepare the 2nd National GHG Inventory (NGI) which submitted to UNFCCC in year 2011. The project steering committee which composed of representatives from public and private sectors provided helpful technical support. Normally, the GHG information was collected from the focal point of related government agencies and public and private sector based on concept of Top down approach though each request in voluntary cooperation. Nowadays, the related agencies do not have mandatory to report GHG information for supporting the national inventory so there are not dedicated human resources responsible for GHG related tasks. Main barrier of the successful and effectiveness of the national GHG inventory is information management system since the relevant information come from different sources, various organizations, and many standards. Also, those information are collected in accordance with their own demand not directly provide for the national GHG inventory system. Consequently, information neutral standardize system, national database, and information collecting guideline and protocol are critical elements that ensure to get the updated and applicability GHG information for more efficient and high quality of GHG inventory system. However, those requirements need huge amount of financial support and manpower for developing and continuing system operation which are the key challenges on national inventory system.

References

NA

Access to relevant information

NA

The Development of Japan's National System

Elsa Hatanaka

Greenhouse Gas Inventory Office of Japan, Japan

Abstract

The Kyoto Protocol required each Annex I Party to have its National System for GHG inventory preparation in place by the end of 2006 (Article 5). A “National System” includes everything relevant to national GHG inventory preparation, such as the legal basis, institutional arrangements, flow of the inventory compilation process, quality assurance and quality control (QA/QC) of the inventory, and the inventory improvement plan.

Japan’s legal basis for inventory preparation is Article 7 of the Act on Promotion of Global Warming Countermeasures, which reads, "In order to prepare the inventory prescribed in Article 4, paragraph 1 (a) of the United Nations Framework Convention on Climate Change and the annual inventory prescribed in Article 7, paragraph 1 of the Kyoto Protocol, the national government shall calculate greenhouse gas emissions and removals in Japan each year, and the results shall be published as prescribed by an Ordinance of the Ministry of the Environment." The Current Institutional arrangement is set up in line with this act, with the Ministry of the Environment as the entity responsible for inventory compilation, and the Greenhouse Gas Inventory Office of Japan (GIO) as the entity to do the actual compilation of the inventory.

Japan’s National system developed in five stages. The first phase was between 1992 and 1994, where the Environment Agency (currently the Ministry of the Environment) requested private consultants to compile the inventory with cooperation from the relevant ministries for data provision on an ad hoc request basis. The second phase was between 1996 and 1998, where requests for data provision became more on a continuous basis, and from a wider range of providers, including stakeholder organizations. The Ad hoc Committee for the GHG Emissions Estimation Methods was also established to review and approve estimation methodologies. In phase 3 (1999-2002), the above mentioned Committee became more continuous in nature, and the number of ministries providing data increased. It was also at this time that the Act on Promotion of Global Warming Countermeasures was legislated. The main characteristic of phase 4 (2002-2008) was the establishment of GIO, in order to fulfill the Kyoto Protocol requirement for a national system, and the simultaneous transfer of compilation work from the private consultants to GIO. In 2009, the GHG Inventory Quality Assurance Working Group was established to conduct external QA of the inventory, and with this addition, the current institutional arrangement stands.

Although organizing a National System for inventory compilation takes a long time, we are of the view that it is a necessary element for periodical national GHG inventory preparation, and that it ensures time-series consistency and effective compilation of inventory.

References

COP/MOP Decision 19/CMP.1 - Guidelines for National Systems

3.5 Session IV

Application of National GHG Inventories to mitigation related policies in Japan

Takashi Morimoto

Mitsubishi UFJ Research and Consulting Co., Ltd., Japan

Abstract

In Japan, the national GHG inventories are closely linked to mitigation policies and measures as well as to other policy fields.

Most mitigation countermeasures in the Kyoto Protocol Target Achievement Plan (KPTAP) are related to reducing energy-originated CO₂ emissions, and this is based on the emission structure and trend in Japan as observed in the national GHG inventories. The Japanese government carries out the intensity analysis and factor decomposition to analyze the factors of change of GHG emissions in the national GHG inventories every year. The intensity analysis is performed to assess the trend of intensity such as “CO₂ emissions per unit of activity” and “Energy consumption per unit of activity” based on the data from the national GHG inventories to understand the effects of overall mitigation policies in each sector. The factor decomposition is undertaken to evaluate how much the changes of GHG emissions are caused by factors such as carbon intensity, energy intensity and volume of activity. In addition, the Japanese government also carries out “Progress Evaluation of the KPTAP”, in which the actual figures for all countermeasure evaluation indices are investigated. Through these evaluation techniques, the introduction of new policies and measures as well as the reinforcement of existed policies and measures are considered, and the national GHG inventories provide fundamental data to the PDCA cycle of mitigation policies and measures in Japan.

The national GHG inventories have close relationship with not only mitigation actions but also other policy fields related to mitigation in Japan. The information of national GHG inventories is applied to the development and improvement of domestic MRV system, projections for future emissions, new official statistics, country-specific emission factors and academic research on GHG emissions.

In this way, the national GHG inventories have large spillover effects to various policy fields. Improving the accuracy of the national GHG inventories can improve the quality of these related fields, therefore, accurate and detailed national GHG inventories is important and necessary.

References

National Greenhouse Gas inventories of Japan, MOE, GIO/CGER/NIES
 Kyoto Protocol Target Achievement Plan, Totally revised March 28, 2008
 Progress Evaluation of Kyoto Protocol Target Achievement Plan, 5 April 2013, the Global Warming Prevention Headquarters

Access to relevant information

National GHGs Inventory Report of JAPAN (NIR)

<<http://www-gio.nies.go.jp/aboutghg/nir/nir-e.html>>

Calculation results of Japanese Greenhouse Gas Emissions (in Japanese)

<<http://www.env.go.jp/earth/ondanka/ghg/index.html>>

Measuring Mitigation using the National Inventory: Australia's experience

Dr Renée Kidson, Director National Inventory

*Department of Industry, Innovation, Climate Change, Science, Research and Tertiary
Education, Australia*

Abstract

Australia has over 20 years' experience in compiling and publishing a national greenhouse gas emissions inventory. Analysing the time-series of national emissions over time reveals evidence of continued economic growth *and* a decline in national greenhouse emissions since 2007-08 – challenging the paradigm that emissions mitigation cannot be achieved without negatively impacting GDP. While a range of macroeconomic factors and government policies to mitigate emissions have contributed to this result, the National Inventory is the principle platform to measure emission mitigation, and the Inventory itself contributes to mitigation, through the effects of transparency and coverage which identify the most cost-effective mitigation targets and assist in prioritizing both public and private investment. Transparency is delivered through publishing National Inventory data online for the public via the Australian Greenhouse Emissions Information System (AGEIS); coverage is achieved with a legislative instrument – the National Greenhouse and Energy Reporting Act (NGER), under which companies must report emissions and energy consumption/production above certain thresholds. This forms a rich data set on which to base high-quality National Inventory reporting. The energy sector accounts for ~70% of Australia's total emissions, and the electricity sub-sector has experienced dramatic mitigation in emissions in recent years. A number of factors have contributed to this mitigation. Electricity consumption exhibits partial price elasticity, and demand decline was most strongly attributable to price increases that occurred after 2007-08. Retail electricity prices have risen by around 91 per cent in 5 years, primarily driven by increased expenditure on Australia's electricity network infrastructure. The Australian Government introduced a Renewable Energy Target (RET) in 2001, and government subsidies encouraging investment in solar photo-voltaic systems have contributed to reduced demand from the electricity grid. Long- and short-term structural changes in the Australian economy since 2007-08 have reduced some emission-intensive-trade-exposed sub-sectors. Energy efficiency improvements have reduced per capita electricity demand and average residential grid electricity demand has fallen in recent years. Collectively, these negative demand drivers out-weighed positive demand drivers, which included continued population growth, along with more subdued income growth following the Global Financial Crisis (GFC). The National Inventory has also documented important mitigation effects in other sectors. Waste sector emissions have declined since 1990, largely due to methane ('biogas') re-capture opportunities at landfills. Under Kyoto Protocol accounting rules, Australia's Land Sector emissions from deforestation have declined since 1990. Deforestation in Australia is a function of farmers' terms-of-trade (e.g. agricultural commodity prices, foreign exchange rates), climatic conditions, and land clearing policies in each State. Since 1990, land clearing policies have in general tightened, with stricter approval processes, reflecting greater appreciation of environmental issues in the community. Emission removals associated with reforestation have conversely increased in Australia since 1990.

The Australian Government introduced a carbon price on 1st July 2012, where large emitting companies pay per tonne of CO₂-e. This harnesses market forces to provide a further incentive for emission mitigation. However, challenges remain for Australia's emission mitigation efforts, to ensure mitigation already realized is sustained, and that further mitigation is achieved. Australia has set an ambitious target for the Second Commitment Period of the Kyoto Protocol, which involves a net reduction in national emissions in real terms relative to the 1990 base year. Continued high-quality National Inventory reporting will continue to underpin the measurement of Australia's progress towards this objective.

References

National Inventory Report – 2011:

http://unfccc.int/national_reports/annex_i_ghg_inventories/national_inventories_submissions/items/7383.php

Quarterly Update to National Inventory - December 2012:

http://www.climatechange.gov.au/publications?field_document_type_tid=36&title=quarterly&=Search

Access to relevant information

Australian Greenhouse Emissions Information System (AGEIS) online:

<http://ageis.climatechange.gov.au/>

National Greenhouse & Energy Reporting (NGER) legislation online:

<http://www.comlaw.gov.au/Details/F2012C00472>

Indonesia's challenge on developing GHG inventory and mitigation measures

Dida Migfar Ridha

Ministry of Environment, Republic of Indonesia

Abstract

Government of Indonesia has targeted to voluntarily reduce GHG emissions and enhance its capacity in sustainable development. The target was initially stated by the President of Indonesia at the G20 Summit on Sept 2009 that by 2020 Indonesia will reduce GHG emissions by 26 percent unilaterally and up to 41 percent with international support, as compared to Business as Usual. Along with the target, the Government has issued Presidential Decree No. 61 Year 2011 on “National Action Plan on GHG Emission Reduction (RAN-GRK)”, which provides the working plan document for implementing direct and indirect activities related to GHG emission reduction. RAN-GRK is guidance to line ministries and provincial government in planning, implementing, monitoring, and evaluating the national action plan of GHG emission reduction.

In the same year the Government also issued Presidential Decree No. 71 Year 2011 on preparation of National GHG Inventory that aims to provide regular information on level, status, and trend of GHG emission and removals, including carbon stock at national, provincial and municipal/regency level; and to provide information on GHG emission reduction achievement of national climate change mitigation actions. Following this regulation, the GoI under the Ministry of Environment (MoE) is in the process of establishing National System for GHG Inventory (called SIGN).

Following the Durban (COP17) decision, the implementation of mitigation actions have to be measured/monitored, reported and verified (MRV). The MRV concept itself is relatively new for Indonesia and an MRV guideline has not yet been officially developed. However MoE has started discussions among stakeholders in order to design an applicable MRV system in Indonesia which will also to ensure emission reduction from various mitigation actions to be properly captured in national GHG inventory.

There are two approach has been discussed recently, the first is to develop an MRV institution which has a role to maintain mitigation actions' registry system, provide guidance on monitoring and reporting for mitigation actions, and also provide guideline for verification. The registry system will record all data of mitigation action under various schemes as input to national GHG inventory. The second approach is to improve existing data collecting system in national level, in particular data collection process through national statistics agency and line ministries databases. This approach will support GHG inventory estimation process particularly in nationally aggregate level.

References

- Government of Indonesia. 2011. Presidential Decree No. 61 Year 2011 on “National Action Plan on GHG Emission Reduction (RAN-GRK)”.
- Government of Indonesia. 2011. Presidential Decree No. 71 Year 2011 on “Preparation of National GHG Inventory”.

Current Status of Thailand in the Relationship between Inventory and Mitigation Measures

Mr. Jassada Sakulku

Greenhouse Gas Information Center

Thailand Greenhouse Gas Management Organization (Public Organization)

Abstract

Currently, Thailand is preparing for Biennial Update Report (BUR) and the Third National Communication (TNC). TGO was established in 2008, and has mandate to support the preparation of national GHG inventory. TGO information team are continuously doing various works regarding national GHG inventory since the submission of Thailand SNC and also develop the database program to archive the Activities Data (AD), Emission Factor (EF) and perform emission calculation. In addition, this program can support to report preparation. Meanwhile, national GHG inventory is on developing, our team finding the key success factor for GHG inventory is the data reporting system. TGO information team collaborate with relevant agencies to setup the institutional framework and also conduct several consultation workshops to finding the solution to overcome the data reporting issue. One of the important issue from consultation is "how the national GHG inventory can reflex the mitigation outcome from country measure?"

Most of country mitigation measures are link to the incentive program such as "Adder for Electricity Purchasing from Renewable Energy". The monitoring procedure under this program enable the Ministry of Energy collect to necessary data for assessing the successiveness of the renewable energy promoting measure hereupon the assessment of emission amount from fossil fuel which substituted by renewable energy. Nevertheless, the domestic programs are not cover all aspects of GHG emission in difference sector. The international support program such as CDM which need to do an intensive monitoring report and verification enable the inventory team access to the data regarding emission reduction of mitigation projects. Those data can be used in some part of GHG inventory to distinctive the emission reduction effort of the country.

The lesson learn from two cases of data reporting under the incentive programs, Thailand will put domestic effort to improve our data reporting system to support the assessment of the successive of mitigation measures herewith the improvement of national GHG inventory to distinctive the mitigation outcome.

References

NA

Access to relevant information

NA

3.6 Session V

Low Carbon Asia Research Network -Bridging Science and Low Carbon Policy

Shuzo Nishioka

Secretary General, LoCARNet

Institute for Global Environmental Strategies (IGES)

Abstract

LoCARNet (Low Carbon Asia Research Network) is an open network of researchers & research organizations, as well as like-minded relevant stakeholders that facilitates the formulation and implementation of science-based policies for low-carbon development in Asia. It was established on the bases of proposal by Japanese Government at ASEAN+3 Environmental Ministers' Meeting in Cambodia, October 2011.

The 1st Annual Meeting in Bangkok, October 2012, found following issues the research community should tackle for urgent need of planning low carbon development in Asia:

- More precise inventory fit to country's situation as base of NAMA/MRV
- Forestry /Soil/ Land use change modeling for REDD policy
- Consistent long-term low carbon policy: application of integrated assessment model
- Guidelines for low carbon city as good unit of implementation. Local level practices/ decisions / initiatives lead low carbon development
- Traditional value in Asia for leap-frogging, not only
- Expansion of LCS research community and impact to policy process
- Institutionalization of low-carbon green growth
- Technology for leapfrogging

Also, the participants suggested on the working policy of LoCARNet towards achieving low carbon Asia, as follows:

- To reaffirm our basic stance - research at the core for science based policy making
- To fully aware of cooperation with policy-makers, participation of supporters, and expansion of related parties.
- To deliver tangible outputs in a timely manner that can contribute to international discussions
- To facilitate capacity development especially in ways to;
 - promote further involvement of young researchers in LoCARNet activities
 - conduct training for policymakers on low-carbon policy science
- To promote "south-south-north" regional cooperation
- To act as a knowledge broker, conducting matching prominent research with other stakeholders to explore potential opportunities

References

LoCARNet (2012): "Mobilising Wisdom for a low carbon Asia", Synthesis report of First Annual Meeting of LoCARNet, 16-17 October 2012, Bangkok, Thailand

LoCARNet (2013): "Asia's low carbon future: Can Asia change the world through leapfrogging?", Synthesis report of Second Annual Meeting of LoCARNet, 24-25 July 2013, Yokohama, Japan

Access to relevant information

<http://lcs-rnet.org>

**Introduction of MRV Guidebook:
One Hundred Questions about MRV:
from National Greenhouse Gas Inventories to the Clean Development Mechanism**

Kazuhisa KOAKUTSU
*Principal Researcher,
Leader, Climate and Energy Area,
Institute for Global Environmental Strategies (IGES)*

Abstract

In the United Nations Framework Convention on Climate Change (UNFCCC), the concept of MRV (measurable, reportable and verifiable) becomes an essential part of international climate policy regime. While provisions of MRV, e.g. scope, procedure, methodological guidance, etc., are yet to be decided, it is certain that the future MRV system will be built on the existing one.

Examples of these schemes at the national level include national communications (NCs) and national GHG inventories. Another example is the assessment of emission reductions under the clean development mechanism (CDM) and the Joint Crediting Mechanism (JCM). Some developing countries also have experience in MRV beyond what is currently established under the UNFCCC.

One of the objectives of this MRV guidebook is to strengthen the understanding of existing MRV schemes. Learning from earlier experiences by developing countries is also vital to meet their needs and capacities.

The guidebook has two-step approaches. Step 1 provides with questions and answers for understanding the ‘why’, ‘what’, ‘how’, ‘who’, ‘how often’, etc. for existing MRV schemes. Based on this understanding of the overall picture of MRV, Step 2 introduces selected good practices to help developing countries overcome their common challenges.

Q&As on MRV are comprised of two types: common and scheme-specific. The common Q&As are prepared for all of the six MRV schemes. The scheme-specific Q&As are to cover aspects of MRV that are considered to be unique to that particular scheme.

It is important to get an idea of how challenges may occur, in the course of practicing MRV, as well as what kinds of challenges may occur in the context of developing countries. It is believed that a good practice derived from a particular MRV scheme can also be applied to other MRV schemes. We also intend to increase the examples of good practices in subsequent editions of this book.

References

NA

Access to relevant information

NA

Experiences of Designing NAMAs in a MRV manner in Asia -Bottom up approach taken in the MOEJ/OECC Capacity-building Programme-

Makoto Kato,

Principal Researcher

Overseas Environmental Cooperation Center, Japan (OECC)

Abstract

According to UNFCCC COP decisions, NAMAs of developing countries can be diverse, and it is countries' prerogative on what kind of contribution that they offer. At the same time, the decisions clarify some elements, including that NAMAs are always subject to measurement, reporting, and verification (MRV), developing countries can opt to seek international support, NAMAs should aim at (at least) deviation from business-as-usual emission (BAU) of 2020 NAMAs are reported as part of biennial updated report (BUR) together with GHG inventory with quantitative goals and progress indicators, and countries are encouraged to link with low carbon development strategies and planning.

The capacity-building programme under the MOEJ, the OECC in partnership with its partner countries, namely, Cambodia, Lao PRD, Mongolia, and Viet Nam, to apply these elements in efforts to increase domestic preparedness for NAMAs in a MRV manner. Given the situation where current discussion on MRV takes up "many different types of MRVs", the capacity-building team classified "MRV at international level" (through ICA with BUR), "MRV at policy level" (close to monitoring and evaluation of policies and programmes), and "MRV at activity level" (often taken in place in, but not limited to, project-based mechanisms such as the CDM). These MRV may function in as a layered structure.

In the capacity-building programme, a bottom-up approach has been employed, where GHG emission and emission reduction are calculated individually and aggregated to a large sum, ideally to cover a sector as a whole. Such quantification ex ante take into consideration of past emission trends and factors that is planned to or may affect such trends in future (sectoral plans, and factors such as population and economic growth). The benefit of this approach are to facilitate to design MRVs in different levels, and to increase the readiness for finance by clarifying who are responsible for emission and emission reduction, and what are how they will conduct such mitigation actions at concrete level (preparing for programme or project documents, actual prerequisite for finance).

However, in terms of completeness of the sectoral coverage, this approach usually have a challenge, so that it is suggested to refer to and make an adjustment by introducing a top-down approach, by elaborating a sectoral baseline by macro-spective GHG quantification. These were already taken in place and tested as a practice in Japan's Kyoto Target Achievement Plan (KPTAP), which generally provides a useful example of domestic institutional arrangement, GHG quantification, monitoring policy actions with reporting, and comparison with the GHG inventory. In the way forward, the capacity-building programme will move for establishing domestic institutional arrangement with referent to this example.

References

Kyoto Target Achievement Plan (KPTAP), April 2005

http://www.kantei.go.jp/foreign/policy/kyoto/050428plan_e.pdf#search='Kyoto+target+Achievement+Plan'

Access to relevant information

http://www.mmechanisms.org/e/event/details_130607SB38sideevent.html

Role of Developing GHG inventories in Small and Medium Industries for Enhancing NAMAs in the Context of Sustainable Development

Akio Takemoto

Institute for Global Environmental Strategies (IGES), Kansai Research Centre (KRC), Japan

Abstract

Industry is a major sector to emit greenhouse gases (GHGs) in the world. While heavy industries such as iron and steel, aluminum, cement, and pulp and paper share a large amount of GHG emissions in all industries, it is estimated those related to medium and small enterprises (SMEs) emit large amount of GHGs in total, particularly in developing countries. That's because majority of manufactures belong to SMEs. For example, foundry is a typical energy-intensive industry in India. There are nearly 5000 foundry units in the country, out of which 95% belong to SMEs. They consume energy during manufacturing process such as melting, cooling and casting processes, however, they cannot access to the latest energy-efficient technology due to lack of finance, capacity and information. SMEs also play a significant role in social policy because they employ a huge number of poor workers.

Institute for Global Environmental Strategies (IGES), Kansai Research Centre (KRC) and The Energy and Resource Institute (TERI) are jointly conducting the Research Partnership for Application of Low Carbon Technology for Sustainable Development in India (ALCT) project since 2010 supported by the Science and Technology Research Partnership for Sustainable Development (SATREPS) program. The ALCT aims to facilitate transfer of Japanese low carbon technologies that are applicable to SMEs in India, which will enhance mitigation actions in the context of sustainable development in India. The ALCT identified 9 key low-carbon and energy-efficient technologies owned by Japanese private industries which can be transferred to India. The ALCT launched pilot projects installing technologies on electric heat pumps (GHP and EHP), compressed air optimization and induction furnace at the selected sites in foundry and milk industries. The pilot projects cover both "hard" (to install GHPs and EHPs equipment) and "soft" (to improve manufacturing operation) options.

Technical cooperation for SMEs in applying low carbon technologies is quite an important measure to enhance national mitigation actions in India as well as in other developing countries. In order to accelerate the actions, it is essential to develop GHG inventories in these sectors through capacity building for experts and SMEs managers in target countries.

My presentation will introduce the recent development of ALCT project and will suggest assisting developing countries in developing GHG inventories of SMEs in energy-intensive industries to facilitate national mitigation actions in the context of sustainable development.

References

- National Action Plan on Climate Change, Government of India, 2008.
- Foundry Clusters in India –An Overview, Metalworld, January 2007.

Access to relevant information

http://www.iges.or.jp/en/business/jst/activity_alct.html

The importance of GHG inventories for ensuring emission reduction through technology deployment

Toshihiko KASAI

Director General

Kyoto Mechanisms Promotion Department

New Energy and Industrial Technology Development Organization (NEDO), Japan

Abstract

Developing and disseminating low carbon technologies that reduce GHG emission worldwide in creating a sustainable low carbon society.

NEDO is a governmental organization established in 1980. Today NEDO's mission is to promote research and development in the energy, environmental and industrial technology fields to contribute to the resolution of energy and global environmental problems.

Kyoto Mechanisms Promotion Department was consigned by the Japanese government to acquire Credits based on the Kyoto Mechanism and to transfer them to the Japanese government. Another key function of our department is to support the JCM/BOCM scheme by conducting Feasibility Studies and to develop various types of MRV methodologies via our own budget.

Based on the experiences of credit acquisition under the Kyoto Mechanisms, we believe that the JCM/BOCM scheme will be able to supplement CDM. Considering each country's circumstances, JCM/BOCM could be an effective approach to disseminate low carbon technologies.

GHG experts are crucial in structuring MRV that suite each countries' characteristics and circumstance, which is an important factor in facilitating and deploying low carbon technologies.

In this presentation, I will provide a brief introduction of NEDO and its mission, the outline of JCM/BOCM, the reason why we believe JCM/BOCM can supplement CDM, and NEDO's activities under JCM/BOCM scheme together with some examples. NEDO would like to cooperate with each country's GHG inventory experts to develop MRV fitting each country's circumstances.

References

“Recent Development of The Joint Crediting Mechanism (JCM)/Bilateral Offset Credit Mechanism (BOCM)(May 2013 Government of Japan)”

http://www.mmechanisms.org/document/20130523_JCMBOCM_goj.pdf

Access to relevant information

BOCM Related Activities (Topic Keyword, NEDO Homepage)

<http://www.nedo.go.jp/english/index.html>

Examples of MRV at Project Level: Efforts to Draft JCM Methodologies

Osamu Bannai,
Programme Officer,
Carbon Management Department,
Global Environment Centre Foundation (GEC)

Abstract

In order to effectively address the issue of climate change, it is necessary for both developed and developing countries to achieve low-carbon growth all around the world by fully mobilizing technology, markets and finance. Recognizing this necessity, the Government of Japan proposes the Joint Crediting Mechanism (JCM) / Bilateral Offset Credit Mechanism (BOCM) as a means to facilitate the diffusion of leading low-carbon technologies, systems, and so forth in developing countries. Japan has held consultations for the JCM/BOCM with developing countries (e.g. Mongolia, Bangladesh, Indonesia, and Vietnam) since 2011, and made briefings to interested countries as well. Mongolia and Japan signed the bilateral document for the JCM in January 2013, and Bangladesh also signed in March 2013. Japan will continue consultations/briefings with any countries interested in the JCM/BOCM.

Along with the government consultation with interested countries, the Government of Japan launched and implemented Feasibility Studies, MRV Demonstration Projects, and JCM Demonstration Projects as well as capacity building efforts in developing countries as summarised in the following figure.

The Ministry of the Environment, Japan (MOEJ) launched “Feasibility Study (FS) Programme on New Mechanisms” in 2010, in order to solicit GHG mitigation projects / activities supposed to be implemented under the New Mechanisms in the post-2012 framework. The Global Environment Centre Foundation (GEC) has been the commissioned secretariat of CDM FS Programme since 1999 and the FS Programme on New mechanisms since 2010. As a secretariat of FS Programme, GEC has conducted 13 MRV Demonstration Studies and 12 Feasibility Studies implemented in 11 countries in FY2012, focusing on the development of MRV methodologies applicable to the respective projects/activities.

This presentation introduces the recent outcomes of both Feasibility Studies for JCM/BOCM projects/activities and MRV Demonstration Studies (DS) using Model Projects (i.e. MRV Demonstration Projects) implemented under the Programme in FY2012. Simple and practical MRV methodologies are drafted as the result of the GEC’s JCM DS and FS in JFY2012 and through the demonstration studies, emission reductions were measured and reported by local project participants and verified by local verifiers.

References

“Recent Development of The Joint Crediting Mechanism (JCM)/Bilateral Offset Credit Mechanism (BOCM)(May 2013Government of Japan)”
http://www.mmechanisms.org/document/20130523_JCMBOCM_goj.pdf

Access to relevant information

Feasibility Study Programme on Climate Change Mitigation Activities/Projects
http://gec.jp/main.nsf/en/Activities-Climate_Change_Mitigation-Top

Annex I: Agenda

Annex I: Agenda

The 11th Workshop on GHG Inventories in Asia (WGIA11)
- Capacity building for measurability, reportability and verifiability -
Period: 5th – 7th July, 2013,

Venue: International Congress Center, 2-20-3, Takezono, Tsukuba, Ibaraki, 305-0032, Japan
Agenda

Day 1: Morning, 5th July (Fri.)			
08:30-12:00	Mutual Learning (Closed sessions: only the countries participating in the session, chair, facilitators, rapporteur and the WGIA Secretariat can enter conference rooms for the sessions.)		
Sector	Energy	Agriculture:	Waste
Combination of Participating Countries	LAO PDR - Thailand	China – Myanmar	Malaysia - Vietnam
Room	Conference Room 401	Conference Room 402	Conference Room 403
Chair	Mr. Akira Osako (GIO)	Mr. Kohei Sakai (GIO)	Mr. Hiroyuki Ueda (MURC)
Rapporteur	Dr. Takefumi Oda (GIO)		
Note: Mutual learning sessions are closed sessions in order to secure confidentiality of information to be discussed in the sessions so that countries participating in each mutual learning session can provide unpublished information each other reliably and safely. Hence, only participating countries in each session, chair, facilitators, rapporteur and the WGIA Secretariat can enter each room for the sessions. In addition, facilitators shall be registered in advance by receiving acceptances from participating countries in each session and the WGIA Secretariat.			
9:00 – 12:00	SEA Project Informal Meeting		
	Room: Conference Room 404		
12:00-13:30	Lunch		

Day 1: Afternoon, 5th July (Fri.)			
13:30-14:00	Participants Registration		
14:00 – 15:00	Opening Session		
	Room:	Chair:	Rapporteur:
	Multi-purpose Hall	Dr. Yukihiko Nojiri	Ms. Takako Ono
14:00 – 14:10	Welcome Address		Mr. Tanaka (MOEJ)
14:10 – 14:20	Overview of WGIA11		Mr. Naofumi Kosaka (GIO)
14:20 – 14:35	Japan's climate change policies		Mr. Yoshinori Suga (MOEJ)
14:35 – 15:00	Questions and Answers		All
15:00 – 15:30	Group Photo & Tea Break		

15:30 – 17:00	Session I: Progress of National Communication and Biennial Update Reports (BURs)		
	Room: Multi-purpose Hall	Chair: Mr. Nguyen Khac Hieu	Rapporteur: Ms. Takako Ono
15:30 – 15:45	Introduction		Dr. Junko Akagi (GIO)
15:45 – 16:05	Myanmar National Communication Report		Mr. Than Aye (Myanmar)
16:05 – 16:15	Questions and Answers		All
16:15 – 16:30	The progress of preparing BUR in Viet Nam		Mr. Quach Tat Quang (Vietnam)
16:30 – 16:45	Progress, Barriers and Necessary Supports for Preparing Mongolia's first Biennial Update Report		Ms. Tsendsuren Batsuuri (Mongolia)
16:45 – 17:00	Questions and Answers		All
<i>18:00 – 20:00</i>	<i>Reception</i>		

Day 2 Morning, 6th July (Sat.)			
9:00 – 12:30	Session II: Introduction to the Preparation of Biennial Update Reports (BURs)		
	Room: Multi-purpose Hall	Chair: Mr. Kiyoto Tanabe	Rapporteur: Dr. Junko Akagi
9:00 – 9:05	Introduction		Ms. Elsa Hatanaka (GIO)
9:05 – 9:35	Introduction of UNFCCC Biennial Update Reporting Guidelines for Parties not included in Annex I to the Convention		Mr. Dominique Revet (UNFCCC)
9:35 – 10:05	Discussion		All
Activities relevant to BUR preparation implemented by International Organizations			
10:05 – 10:20	IPCC TFI: Recent Activities		Dr. Baasansuren Jamsranjav (IPCC/TFI/TSU)
10:20 – 10:35	The benefits for non-Annex I countries' GHG inventory experts in taking the UNFCCC review course		Mr. Dominique Revet (UNFCCC)
10:35 – 10:50	The SEA GHG Project and its Relevant Activities to Support BUR1 Preparation		Mr. Leandro Buendia (SEA Project)
10:50 – 11:10	Discussion		All
<i>11:10 – 11:35</i>	<i>Tea Break</i>		
Supporting activities relevant to BUR preparation implemented by Annex I countries			
11:35 – 12:00	Challenges for Capacity Development in National GHG Inventory: Experiences of JICA's Technical Cooperation		Japan International Cooperation Agency (JICA)
	Challenges for Capacity Development in National GHG Inventory: Experiences of JICA's Technical Cooperation		Mr. Hideo Noda (JICA)

	Introduction to the Sub-Project on Capacity Development for Developing National GHG Inventories: Sub-Project 3 of Project of Capacity Development for Climate Change Strategies in Indonesia	Mr. Hiroshi Ito (JICA Indonesia)
12:00 – 12:10	Low Emissions Asian Development (LEAD) Program: National GHG Inventory Capacity Building in Asia	Dr. Amornwan Resanond (USAID LEAD Program)
12:10 – 12:30	Discussion	All
<i>12:30 – 14:00</i>	<i>Lunch</i>	

Day 2 Afternoon, 6th July (Sat.)		
14:00 – 15:30	Session III: National Systems for Periodical National GHG Inventory Preparation	
	Room: Multi-purpose Hall	Chair: Dr. Rizaldi Boer
		Rapporteur: Dr. Junko Akagi
14:00 – 14:05	Introduction	Mr. Kohei Sakai (GIO)
14:05 – 14:20	Korea's National System and GHG Inventory in 2010	Dr. Sang-won Lee (Korea)
14:20 – 14:35	Development of National GHG Inventory System: The Malaysia Experience	Mr. Mohd Famey Bin Yusoff (Malaysia)
14:35 – 14:50	Discussion	All
14:50 – 15:05	National GHG Inventory: Development and History of Thailand's National System	Ms. Wasinee Wannasiri (Thailand)
15:05 – 15:20	The Development of Japan's National System	Ms. Elsa Hatanaka (GIO)
15:20 – 15:45	Discussion	All
<i>15:45 – 16:15</i>	<i>Tea Break</i>	
16:15 – 18:00	Session IV: Relationships between inventory and mitigation measures/NAMAs	
	Room: Multi-purpose Hall	Chair: Mr. Taka Hiraishi
		Rapporteur: Dr. Junko Akagi
16:15 – 16:30	Introduction	Dr. Junko Akagi (GIO)
16:30 – 16:45	Application of National GHG Inventories to mitigation related policies in Japan	Mr. Takashi Morimoto (MURC)
16:45 – 17:00	Measuring Mitigation using the National Inventory: Australia's Experience	Dr Renée Kidson (Australia)
17:00 – 17:15	Indonesia's challenge on developing GHG inventory and mitigation measures	Mr. Dida Migfar Ridha (Indonesia)
17:15 – 17:30	Current status of Thailand in the Relationships between Inventory and Mitigation Measures	Mr. Jassada Sakulku (Thailand)
17:30 – 18:00	Discussion	All

Day 3 Morning, 7th July (Sun.)		
9:00 – 12:30	Session V: Enhancement of Network for Supporting Measurement, Reporting and Verification (MRV) at various levels	
	Room: Multi-purpose Hall	Chair: Dr. Sirintornthep Towprayoon
		Rapporteur: Ms. Takako Ono
9:00 – 9:15	Introduction	Ms. Takako Ono (GIO)
9:15 – 9:30	Low Carbon Asia Research Network - Bridging Science and Low Carbon Policy -	Dr. Shuzo Nishioka (LoCARNet)
9:30 – 9:45	Our thoughts on NAMAs and MRV - including national/sub-national NAMA type study by AIM simulations -	Dr. Junichi Fujino (NIES/AIM)
9:45 – 10:00	Introduction of MRV Guidebook: One Hundred Questions about MRV: from National Greenhouse Gas Inventories to the Clean Development Mechanism	Mr. Kazuhisa Koakutsu (IGES)
10:00 – 10:20	Discussion	All
10:20 - 10:40	Tea Break	
10:40 – 10:55	Experiences of Designing NAMAs in a MRV manner in Asia – Bottom up approach taken in MOEJ/OECC Capacity-building Programme –	Mr. Makoto Kato (OECC)
10:55 – 11:10	Role of GHG Inventories in Small and Medium Industries for enhancing NAMAs in the Context of Sustainable Development	Dr. Akio Takemoto (IGES)
11:10 – 11:30	Discussion	All
11:30 – 11:45	The importance of GHG inventories for ensuring emission reduction through technology deployment	Mr. Toshihiko Kasai (NEDO)
11:45 – 12:00	Examples of MRV at Project Level: Efforts to Draft JCM Methodologies	Dr. Osamu Bannai (GEC)
12:00 – 12:30	Discussion	All
12:30 – 14:00	Lunch	

Day 3 Afternoon, 7th July (Sun.)		
14:00 – 17:00	Wrap-up Session	
	Room: Multi-purpose Hall	Chair: Dr. Yukihiro Nojiri
<u>Mutual Learning Sessions</u>		
14:00 – 14:15	Summary of Mutual Learning Sessions	Dr. Takefumi Oda (GIO)
14:15 – 14:45	<u>Discussion</u>	<u>All</u>
14:45 – 15:15	<i>Tea Break</i>	
<u>Plenary Sessions</u>		
15:15 – 15:30	Summary of Plenary Sessions: Opening Session and Sessions IV and V	Ms. Takako Ono (GIO)
15:30 – 15:45	Summary of Plenary Sessions: Sessions I, II and III	Dr. Junko Akagi (GIO)
15:45 – 16:45	<u>Discussion</u>	<u>All</u>
<u>Closing Remarks</u>		
16:45 – 17:00	Closing Remarks	Dr. Hideo Harasawa (NIES)
Day 3 Evening, 7th July (Sun.)		
17:30 – 18:30	Joint Meeting of the WGIA Organizing Committee and Advisory Board (closed meeting: members of OC and AB, and the WGIA Secretariat only)	
	Room: Conference Room 304	Chair: Ms. Takako Ono (GIO)
17:30 – 18:00	Review of activities in WGIA11	All
18:00 – 18:30	Discussion on topics for WGIA12	All

Annex II: List of Participants

Annex II: List of Participants

PARTICIPATING COUNTRIES

CAMBODIA

Mr. Sothea KOK
Department of Environmental Science, Royal
University of Phnom Penh

Mr. Sophal LEANG
Climate Change Department, Ministry of
Environment

CHINA

Dr. Shenghui HAN
Institute of Atmospheric Physics, Chinese
Academy of Sciences

Dr. Wen ZHANG
Institute of Atmospheric Physics, Chinese
Academy of Sciences

INDIA

Dr. Sultan SINGH
Plant Animal Relationship, Indian Grassland
and Fodder Research Institute, Jhansi

INDONESIA

Dr. Rizaldi BOER
Centre for Climate Risk and Opportunity
Management in Southeast Asia and Pacific of
Bogor Agriculture University

Dr. Sandhi Eko BRAMONO
Directorate General of Human Settlements,
Ministry of Public Works

Mr. Hiroshi ITO
Capacity Development for Developing
National GHG Inventories, Japan International
Cooperation Agency

Mr. Dida Migfar RIDHA
Greenhouse Gas Inventory, Ministry of
Environment

Mr. Iman SANTOSA
Directorate of Forest Resources Inventory and

Monitoring, Ministry of Forestry

Mr. Gatot SETIAWAN
Assistant Deputy for Mitigation and
Atmospheric Preservation, Ministry of
Environment

Dr. Prihasto SETYANTO
Indonesia Agency for Agricultural Research and
Development, Ministry of Agriculture

Ms. Emmy SURYANDARI
Centre of Assessment for Green Industry and
Environment, Ministry of Industry

Ms. Helena Lina SUSILAWATI
Indonesian Agency for Agriculture Research
and Development, Ministry of Agriculture,
Chiba University

Mr. Prasetyadi UTOMO
Mitigation and Atmospheric Preservation,
Ministry for Environment,

JAPAN

Dr. Junko AKAGI
Greenhouse Gas Inventory Office of Japan,
Center for Global Environmental Research,
National Institute for Environmental Studies

Dr. Yumiko ASAYAMA
Center for Social and Environmental Systems
Research, National Institute for Environmental
Studies

Dr. Osamu BANNNAI
Carbon Management Department, Global
Environment Centre Foundation

Dr. Junichi FUJINO
Center for Social and Environmental Systems
Research, National Institute for Environmental
Studies

Mr. Yasuo FUJISHIMA
Environment Division, SUURI-KEIKAKU CO.,
LTD.

Mr. Masayoshi FUTAMI
Overseas Environmental Cooperation Center

- Dr. Tatsuya HANAOKA
Center for Social and Environmental Systems
Research, National Institute for Environmental
Studies
- Dr. Hideo HARASAWA
National Institute for Environmental Studies
- Ms. Elsa HATANAKA
Greenhouse Gas Inventory Office of Japan,
Center for Global Environmental Research,
National Institute for Environmental Studies
- Dr. Keizo HIRAI
Kyoto Mechanisms Promotion Department,
New Energy and Industrial Technology
Development Organization
- Mr. Takahiko HIRAISHI
Institute for Global Environmental Strategies
- Mr. Norihiko INOUE
Environmental Science & Engineering Dept.,
Nippon Koei Co., Ltd
- Prof. Kazuyuki INUBUSHI
Graduate School of Horticulture, Chiba
University
- Dr. Tomonori ISHIGAKI
Center for Material Cycles and Waste
Management Research, National Institute for
Environmental Studies
- Ms. Kyomi ISHIGAMI
Greenhouse Gas Inventory Office of Japan,
Center for Global Environmental Research,
National Institute for Environmental Studies
- Ms. Tomoko ISHIKAWA
Green Growth and Green Economy Area,
Institute for Global Environmental Strategies
- Ms. Saeko KAJIMA
Overseas Environmental Cooperation Center
- Ms. Emi KANEKO
Overseas Environmental Cooperation Center
- Mr. Toshihiko KASAI
Kyoto Mechanisms Promotion Department,
New Energy and Industrial Technology
Development Organization
- Mr. Yasuhiro KASUYA
Overseas Environmental Cooperation Center
- Mr. Kazuhisa KATO
Japan Overseas Forestry Consultants
Association
- Mr. Makoto KATO
Overseas Environmental Cooperation Center
- Dr. Kosuke KAWAI
Center for Material Cycles and Waste
Management Research, National Institute for
Environmental Studies
- Mr. Kazumasa KAWASHIMA
Environment and Energy Dept., Mitsubishi UFJ
Research and Consulting Co., Ltd.
- Mr. Kazuhisa KOAKUTSU
Climate and Energy Area, Institute for Global
Environmental Strategies
- Mr. Masanori KOBAYASHI
Kyoto Mechanisms Promotion Department,
New Energy and Industrial Technology
Development Organization
- Mr. Yuko KOMIYA
Overseas Environmental Cooperation Center
- Mr. Masaya KONISHI
International Cooperation Bureau, Ministry of
Foreign Affairs
- Mr. Naofumi KOSAKA
Greenhouse Gas Inventory Office of Japan,
Center for Global Environmental Research,
National Institute for Environmental Studies
- Ms. Rieko KUBOTA
Center for Material Cycles and Waste
Management Research, National Institute for

Environmental Studies

Mr. Ayato KUROKAWA
Clean Energy Finance Division, Mitsubishi
UFJ Morgan Stanley

Mr. Jun MARUKAWA
Environment Division, SUURI-KEIKAKU
CO., LTD.

Mr. Yusuke MIYAZAKI
Environment Division, SUURI-KEIKAKU
CO., LTD.

Mr. Takashi MORIMOTO
Environment and Energy Dept., Mitsubishi
UFJ Research and Consulting Co., Ltd.

Mr. Yushin NAKAO
Overseas Environmental Cooperation Center

Dr. Shuzo NISHIOKA
Green Growth and Green Economy Area,
Institute for Global Environmental Strategies

Mr. Hideo NODA
Global Environment Department, Japan
International Cooperation Agency

Dr. Yukihiro NOJIRI
Greenhouse Gas Inventory Office of Japan,
Center for Global Environmental Research,
National Institute for Environmental Studies

Mr. Shinsuke ODA
Global Environment Bureau, Ministry of the
Environment

Dr. Takefumi ODA
Greenhouse Gas Inventory Office of Japan,
Center for Global Environmental Research,
National Institute for Environmental Studies

Mr. Jiro Miguel OGAHARA
Overseas Environmental Cooperation Center

Mr. Masakazu OKADA
Environment Division, SUURI-KEIKAKU
CO., LTD.

Ms. Takako ONO
Greenhouse Gas Inventory Office of Japan,
Center for Global Environmental Research,
National Institute for Environmental Studies

Mr. Akira OSAKO
Greenhouse Gas Inventory Office of Japan,
Center for Global Environmental Research,
National Institute for Environmental Studies

Mr. Masanobu OYA
Global Environment Bureau, Ministry of the
Environment

Ms. Mihoko SAKAI
Global Environment Bureau, Ministry of the
Environment

Mr. Kohei SAKAI
Greenhouse Gas Inventory Office of Japan,
Center for Global Environmental Research,
National Institute for Environmental Studies

Mr. Toru SHIOZAWA
Kyoto Mechanisms Promotion Department,
New Energy and Industrial Technology
Development Organization

Dr. Yasuhito SHIRATO
Natural Resources Inventory Center, National
Institute for Agro-Environmental Sciences

Mr. Yoshinori SUGA
Global Environment Bureau, Ministry of the
Environment

Dr. Akimasa SUMI
President, National Institute for Environmental
Studies

Mr. Hitoshi SUZUKI
Pacific Consultants Co., Ltd

Dr. Tomoyuki SUZUKI
Animal Physiology and Nutrition Research
Division, NARO Institute of Livestock and
Grassland Science

Mr. Tomoki TAKAHASHI
Environment and Energy Dept., Mitsubishi
UFJ Research and Consulting Co., Ltd.

Mr. Akio TAKEMOTO
Kansai Research Centre, Institute for Global
Environmental Strategies

Mr. Satoshi TANAKA
Ministry of the Environment, Japan

Ms. Natsumi TANIMURA
Kyoto Mechanisms Promotion Department,
New Energy and Industrial Technology
Development Organization

Ms. Naoko TSUKADA
Climate Change Office, Forestry and Forest
Products Research Institute

Mr. Hiroyuki UEDA
Environment and Energy Dept., Mitsubishi
UFJ Research and Consulting Co., Ltd.

Dr. Chisa UMEMIYA
Climate and Energy Area, Institute for Global
Environmental Strategies

Ms. Takako WAKIYAMA
Green Growth and Green Economy Area,
Institute for Global Environmental Strategies

Ms. Masako WHITE
Greenhouse Gas Inventory Office of Japan,
Center for Global Environmental Research,
National Institute for Environmental Studies

Dr. Kazuyuki YAGI
National Institute for Agro-Environmental
Sciences

LAO P.D.R.

Mr. Immala INTHABOUALY
Department of Disaster Management and
Climate Change, Ministry of Natural
Resources and Environment

Mr. Mone NOUANSYVONG
Department of Disaster Management and
Climate Change, Ministry of Natural Resources
and Environment

Mr. Bounthee SAYTHONGVANH
Department of Disaster Management and
Climate Change, Ministry of Natural Resources
and Environment

MALAYSIA

Mr. Mohd Helmi OTHMAN
Policy and Planning, National Solid Waste
Management Department

Ms. Amy Charlene WONG
Department of Environment
Ministry of Natural Resources and Environment

Mr. Mohd Famey Bin YUSOFF
Department of Environment, Ministry of
Natural Resources and Environment

MONGOLIA

Ms. Tsendsuren BATSUURI
Climate Change Coordination Office, Ministry
of Environment and Green Development

Ms. Tegshjargal BUMTSEND
Climate Change Coordination Office, Ministry
of Environment and Green Development

MYANMAR

Mr. Than AYE
Environmental Conservation Department,
Ministry of Environmental Conservation and
Forestry

Mr. Khin Maung OO
Horticulture Department
Yezin Agricultural University

Dr. Khin Lay SWE
Academic Affairs
Yezin Agricultural University

PHILIPPINES

Ms. Sandee Gamulo RECAPAR
Climate Change Office, Climate Change
Commission

Ms. Pebbles Badillo SANCHEZ
Climate Change Office, Climate Change
Commission

REPUBLIC OF KOREA

Dr. Byong Bok JIN
Department of Climate Change Action,
Korea Environment Corporation

Dr. Sang Won LEE
Department of Climate Change Action, Korea
Environment Corporation

Mr. An Woo NAM
Department of Climate Change Action, Korea
Environment Corporation

Mr. Sung Hee SHIM
Climate Change Policy Research Group
Korea Energy Economics Institute

Mr. Sung ho SHIN
Department of Climate Change Action, Korea
Environment Corporation

THAILAND

Dr. Woranuch EMMANOCH
Office of Natural Resources and
Environmental Policy and Planning

Mr. Jassada SAKULKU
Greenhouse Gas Information Center, Thailand,
Greenhouse Gas Management Organization

Dr. Karnnalini THEERARATTANANOON
Bureau of Energy Research, Department of
Alternative Energy Development and
Efficiency

Dr. Sirintornthep TOWPRAYOON
Joint Graduate School of Energy and
Environment, King Mongkut's University of
Technology Thonburi

Ms. Wasinee WANNASIRI
GHG Information Center, Thailand,
Greenhouse Gas Management Organization

VIET NAM

Ms. Trang Minh DAO
Institute of Meteorology, Hydrology and
Environment

Mr. Thang Ngoc LE
Centre for Environmental Consultancy and
Technology, Viet Nam Environment
Administration

Mr. Hieu Khac NGUYEN
Department of Meteorology Hydrology and
Climate Change, Ministry of Natural
Resources and Environment

Dr. Lanh NGUYEN
Institute of Strategy and Policy on Natural
Resources & Environment, Ministry of
Natural Resources and Environment

Mr. Quang Tat QUACH
Department of Meteorology, Hydrology and
Climate Change, Ministry of Natural
Resources and Environment

Mr. Akihiro TAMAI
Project for Capacity Building of National
Greenhouse Gas Inventory in Vietnam,
Japan International Cooperation Agency

OTHERS

AUSTRALIA

Dr. Renée Louise KIDSON
Land, Department of Industry, Innovation,
Climate Change, Science, Research &
Tertiary Education

IPCC TFI TSU

Ms. Maya FUKUDA
Technical Support Unit, Task Force on
National Greenhouse Gas Inventories,
Intergovernmental Panel on Climate Change

Dr. Baasansuren JAMSRANJAV
Technical Support Unit, Task Force on
National Greenhouse Gas Inventories,
Intergovernmental Panel on Climate Change

Mr. Kiyoto TANABE
Technical Support Unit, Task Force on
National Greenhouse Gas Inventories,
Intergovernmental Panel on Climate Change

SEA GHG Project

Mr. Leandro Valmonte BUENDIA
Regional Capacity Building Project for
Sustainable National Greenhouse Gas
Inventory Management Systems in Southeast
Asia

UNFCCC

Mr. Dominique André REVET
Mitigation, Data and Analysis Programme,
United Nations Framework Convention on
Climate Change Secretariat

**US Low Emissions Asian Development
Program**

Ms. Toby Leah MANDEL
Low Emissions Asian Development Program,
ICF International

Ms. Lauren PEDERSON
Low Emissions Asian Development Program

Dr. Amornwan Mai RESANOND
Low Emissions Asian Development Program

