Summary of Mutual Learning

28th July 2016,　Ulaanbaatar, Mongolia
14th Workshop on GHG Inventories in Asia

Greenhouse Gas Inventory Office of Japan (GIO)
National Institute for Environmental Studies (NIES)

Outline

- Background of mutual learning (ML) program
  - Overview
  - History
  - Procedure
- Report on each session
  - Overview of each country's inventory
  - Outcome of sessions
    - Energy
    - Industrial Processes
    - LULUCF
    - Waste

Background of ML program Overview

- Purpose
- To enhance sector-specific capacity for inventory compilation by learning from the partner county's inventory
  - Understand methodologies
  - Share experiences
  - Find new aspects
  - Apply the knowledge acquired to compilation

- Approach
- Bilateral learning
- Exchange of the inventories
  - document on methodology
  - spreadsheet for calculation
- Reading carefully, clarifying with questions
- Learning mutually good practices from the partner country's inventory
  - Open-minded communication
  - Sharing experiences

History

	2011 WGIA9	2012 WGIA10	2013 WGIA11	2014 WGIA12	2015 WGIA13	2016 WGIA14
General	-	-	-	-	Japan Vietnam	
Energy	Indonesia Mongolia	Cambodia Thailand	Lao PDR Thailand	Indonesia Myanmar	-	**Brunei** **Korea**
IP	-	Indonesia Japan	-	-	-	**Malaysia** **Myanmar**
Agriculture	-	Indonesia- Vietnam	China Myanmar	China Mongolia	Indonesia Lao PDR	
LULUCF	Japan Lao PDR	-	-	Vietnam	Cambodia Mongolia	**Indonesia** **Lao PDR**
Waste	Indonesia Cambodia Korea	China Korea	Malaysia Vietnam	-	Korea Myanmar	**Mongolia** **Thailand**

- Trial implementation between Japan and Korea since 2008
- Introduction to ML activity on WGIA 8
- Added as official programme into WGIA since 2011(WGIA9)
- Added a session for General (cross cutting issues) on WGIA13.

Experienced countries

WGIA country combinations table

Sessions held between WGIA**9** (year2011) to WGIA**14** (year2016)

The number in the cell shows WGIA # when it was held

	Brunei	Cambodia	China	India	Indonesia	Japan	Lao	Malaysia	Mongolia	Myanmar	Korea	Thailand	Vietnam
Brunei											WGIA14		
Cambodia					*9**				13		*9**	10	
China									12	11	10		
India													
Indonesia		*9**				10	13 14		9	12	*9**		10
Japan					10		9						13
Lao					13 14	9						11	
Malaysia										WGIA14			11
Mongolia		13	12		9							WGIA14	
Myanmar			11		12			WGIA14			13		
Korea	WGIA14	*9**	10		*9**					13			
Thailand		10					11		WGIA14				
Vietnam					10	13		11					*12**
Total	1	3	3	0	7	3	4	2	4	4	4	3	4

Energy 5	**Agriculture 4**	**Waste 6**
IP 2	**Lulucf 4**	**General 1**

Median of number of sessions/Country: **4** in 6 years

total: 22 sessions

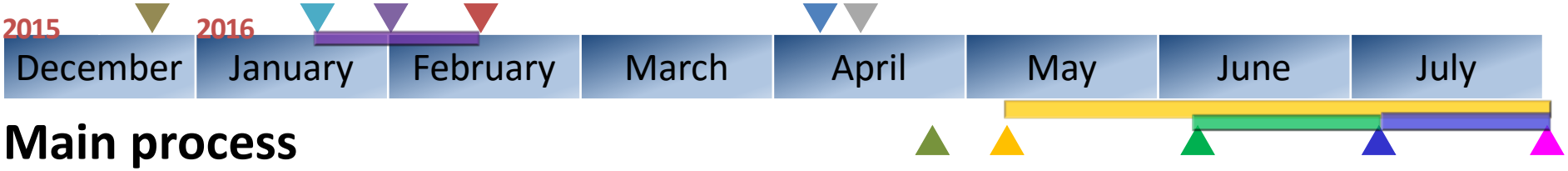
***9 ** Waste with 3 parties in WGIA9*

***12 ** Vietnam had no partner in WGIA12*

Process of Mutual Learning

Preliminary process

- Announcement : December 24, 2015
- Application deadline : January 22, 2016
- Determination of ML participants : February
- Inquiry of the section and the partner party to the accepted group : February 18, 2016
- Final announcement for acceptation and request for submission of materials : April 13, 2016
- Ask Organizing Committee members to nominate WGIA participants to include the group accepted for the ML : April 19, 2016



Main process

- Submission of materials deadline : April 22, 2016
- Starting date of Material Exchange [Learning the materials] : May 9, 2016
- Comment exchange deadline [Answering the comments] : June 8, 2016
- Answer to comments deadline : June 30, 2016
  [Preparation for face-to-face discussion]
- sessions : July 26, 2016

Comment exchange

1.Category: Solid Waste Disposal on Land

☐ Methodology	☐ Emission Factor	☑ Activity Data	☐ Other

Question or Comment:

Could you show the amount of landfills by waste type and by year in table form?

Answer:

See attached file; it is a confidential data. Please keep a secret.

☐ Methodology	☐ Emission Factor	☐ Activity Data	☑ Other

Question or Comment:

All landfills in Japan are considered 'Managed landfill' in accordance with Waste Disposal and Public Cleaning Law. Are the specific contents of this law available in relation to the design of landfills and can it be compared with the standard of 'Managed landfill' of 2006 IPCC G/L?

Answer:

Our 'Managed Landfill' meets the standard of 2006 Guidelines. Please refer for details to the 'Ministerial Ordinance on Technological Standards for Final Disposal Sites of Municipal and Industrial Waste.' (http://law.e-gov.go.jp/htmldata/S52/S52F03102004001.html).

☐ Methodology	☐ Emission Factor	☐ Activity Data	☑ Other

Question or Comment:

The country-specific value is used for "methane generation speed constant (k),". How is the uncertainty of country-specific methane generation rate value(k) estimated?

Answer:

We estimate XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX.

Items	Half life (y)	K value	Uncertainty of k value (%)
Kitchen garbage	***	***	***
Waste paper	***	***	***
Waste textile (natural fiber)	***	***	***
Waste wood	***	***	***
Sludge	***	***	***

Sample

■ Procedures

- Reading partner's materials carefully
- Filling up **questions and comments** on "comment exchange sheet"
- Comment exchange through GIO secretariat
- **Answering** to the comments
- Session on the comment exchange

Comment exchange sheet

Sessions on WGIA14

Sector	Country	Number of Participants
Energy	Brunei	2
	Korea	3
Industrial Process	Malaysia	3
	Myanmar	3
LULUCF	Indonesia	4
	Lao	3
Waste	Thailand	4
	Mongolia	2

A scene of the Energy sector session between Brunei and Korea

- Closed sessions for limited participants
  - For very frank discussion
  - Supported by several resource persons

Report on each session
Overview of each country's inventory

Sector	Country	Inventory	Guidelines applied	Estimation Methodology	Emission factors	Activity data
Energy	**Brunei**	FNC in 2016	Revised 1996 IPCC GLs	Tier 1	IPCC default values	National Statistics
	Korea	SNC in 2012, BUR in 2014	Revised 1996 IPCC GLs and partially 2006 IPCC GLs	Basically Tier 1, partially Tier 2 and Tier 3	Basically IPCC default values, partially CS	Energy Statistics Yearbook, and other statistics
Industrial Process	**Myanmar**	INC in 2012	2006 IPCC GLs	Tier 1	2006 IPCC GLs default values and CS	National statistics and data provided by industry
	Malaysia	BUR in 2016	Revised 1996 IPCC GLs, GPGs, and 2006 IPCC GLs	Tier 1/Tier 2	IPCC 96/06 default values and CS	Data provided by industry, National statistics, and int'l sources
LULUCF	**Indonesia**	First BUR in 2015 (inventory years 2000-2012)	2006 IPCC GLs	Tier 1 and 2	CS, Default	Mainly from Satellite data and survey (hybrid of approach 2 and 3
	Lao PDR	SNC in 2013 (inventory year 2000 and GHGI 2010 spreadsheet)	Revised 1996 IPCC GLs and GPG-2003	Tier 1	Default	Mainly from national forest inventory report/system
Waste	**Thailand**	3rd NC draft BUR in 2015	1996 IPCC GLs/ GPG2000/ 2006GLs	Tier2 for Key category, Tier 1	CS and IPCC default values	National statistics
	Mongolia	SNC in 2010 (1990-2006)	1996 IPCC GLs/ GPG2000/ 2006GLs	Tier2 for Key category, Tier 1	CS and IPCC default values	Mainly from national statistics

1. Energy (1)
(Brunei and Korea)

■ **Issues and solutions / Outstanding issues**

Brunei

- Difficulty in collecting data due to lack of detailed information.
- Human resource is limited. No dedicated team member for inventory in each sector.
- Data management issues (e.g. simplifying workbook for solution.)

Korea

- Precise sectoral activity data are desired, while national total data are reliable.
- More close work between energy and transport experts is planned.
- Difficulty in adopting the 2006 IPCC guidelines.

1. Energy (2)
(Brunei and Korea)

■ **Good practice**

Brunei

- Easy access to data by merging ministries.
- Holding regular capacity building sessions with governmental stakeholders.

Korea

- Developed own inventory data system including software package.
- Developed own energy balance table.
- Working closely with stakeholders and ministries.
- Producing CRF files (That is a big challenge for NAI country.)

■ **Suggestion for future ML**

- Inclusion of common format (summary table of emissions by gas and category) in material exchange

2. Industrial Processes (1) (Myanmar and Malaysia)

■ **Issues and solutions / Outstanding issues**

- How to aggregate AD to use in the national level inventory (who compiles it/checks it etc)
- How to disaggregate AD (e.g. to calculate emissions from Iron and Steel Production using the 2006 IPCC Guidelines - by process type /furnace type)
- How to construct of AD (e.g. for each sub-category under Refrigeration and Air Conditioning)
- How to deal with smaller sources/(smaller) non-CO2 emissions, and prioritization of work
- Better Uncertainty Assessments
- Better Institutional arrangements for the IP sector inventory, especially with regard to data provision
- How to deal with the issue of historical data availability
- How to explain Country-specific EFs transparently
- Harmonization of national inventory and corporate reported data (for the future)

2. Industrial Processes (2) (Myanmar and Malaysia)

■ **Good practices**

- Building trust and capacities in the stakeholders (e.g. private sector data providers), through utilization of Workshops - asking for data and later providing results of calculations, or providing explanations of data handling to alleviate concerns on confidentiality
- Better understanding of the IPCC Guidelines, leading to better AD provision and development of Country-Specific EFs
- Applying newer default values from the 2006 IPCC Guidelines

2. Industrial Processes (3) (Myanmar and Malaysia)

■Follow-up activities

- Further consideration of other emissions than CO2 such as CH4, N2O, and NMVOCs etc could be done for all sources
- Re-evaluation of Lime production AD and EF

■Suggestions for future ML

- Discuss more on how the AD and EFs are compiled/established, to ensure/enhance the completeness of the inventory
- Focus on new gases and sources (e.g. F-gases sources)
- Discuss data archiving, in light of biennial reporting

LULUCF sector (1)
(Lao PDR [LAOS] and Indonesia [IDN])

■ Issues and solutions/ Outstanding issues

- Some categories (such as CO_2 emissions and removals from mineral soil) are not estimated, inadequate AD (LAOS).
- Key category analysis was not conducted, but it will be done in future, full TNC (LAOS).
- Changes from primary forest to secondary forest and other land uses were not fully estimated or estimated data was used (LAOS).
- Treatment of agricultural plantation and agroforestry in terms of land use definitions should be considered, (especially canopy >20%) (Both).

■ Good practices

- Institutional arrangement for GHG inventory is established-build on existing (Both).
- Template tables of 1996 IPCC Guidelines were applied for calculation of GHG emissions and removals with the use of updated EF e.g., 2006 GL (LAOS). It is easy to track the calculation process.

LULUCF sector (2)
(Lao PDR [LAOS] and Indonesia [IDN])

■ Good practices (continued.)

- In accordance with the IPCC 2006 Guidelines, key category analysis (with LUCF and without LUCF) were conducted for data of 2012 (IDN) .
- Uncertainty analysis (with LUCF and without LUCF) were conducted qualitatively by Tier1 (IDN) .
- Applying IPCC 2006 Guidelines as well as 2013 Wetlands Supplement (IDN). Some data applied to the GHGI and REDD+ Reference Levels (RLs) in forest sector (IDN).
- Hybrid approach in land representation are conducted (IDN).
- CS information of biomass stock in “after conversion” is made (LAOS).
- Illegal logging information in the loss estimation is reflected (Both).

■ Follow-up activity

- Improving methodologies and data, including land representation should be improved (IDN)
- Applying 2006GL and moving to higher tier with the use of CS and EF (LAOS)
- Applying good practices of other countries (Both)

4. Waste sector (1)
(Mongolia and Thailand)

■ Issues and solutions / Outstanding issues

Solid Waste Disposal

- Mongolia announced that FOD method will be adopted in their current ongoing GHG inventory preparation with historical waste data. Thailand shared their way of activity data collection and estimation method for completing historical activity data.
- Thailand shared their experience that waste composition may be influenced by a level of urbanization of city and its recycle policy.

Waste Water Handling

- Mongolia and Thailand shared common understanding that CH_4 and N_2O emissions from untreated wastewater need to be estimated in GHG inventory based on 2006 GL.
- Thailand raised necessity of considering temperature for determining MCF for EF for septic tank. Low temperature such as Mongolia in winter season may affect CH_4 and N_2O production.

Uncertainty

- Mongolia informed that uncertainty analysis will be conducted in their current ongoing GHG inventory preparation.
- Thailand shared result of uncertainty analysis with Tier 1 methodology in the waste sector and explained its next improvement plan to upgrade uncertainty in EF.

4. Waste sector (2) (Mongolia and Thailand)

■ **Good practice**

Thailand

- There was significant update from SNC (2011) to BUR (2015) in the waste sector in terms of accuracy and completeness. Key driving force of this improvement in Thailand is deciding national GHG reduction target as INDC and national plan for promoting mitigation actions.

Mongolia

- Mongolia introduced new country specific MCF for CH_4 emissions from septic tank for some industrial wastewater, which is major GHG emission sources in the wastewater treatment category in Mongolia, based on domestic research.

■ **Follow-up activity**

- Thailand will update uncertainty analysis for the next GHG inventory preparation.
- Mongolia will apply FOD method for estimating CH_4 emissions from SWDS and conduct uncertainly analysis in the next GHG inventory preparation.

■ **Suggestion for future ML**

- ML with 3 or 4 participating countries may be effective in terms of more wider information sharing. However, necessary time for discussion should be considered.
- More in-depth discussion on the estimation of GHG emissions under limited AD availability and/or country-specific EF for estimation of emissions will be effective.

Take advantage of
this opportunity
to improve the sectoral
inventory compilation !!!