



# Summary of Mutual Learning

1st August 2019, Singapore  
17th 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
  - General
  - Energy
  - Agriculture



# Background of ML program

## Overview

### ■ Objectives

- To help inventory compilers improve their national GHG inventories
- To provide an opportunity to learn details of other countries' inventory
- To foster and strengthen cooperative relationships among inventory experts



### ■ Approach

- Active and voluntary participation of experts who actually produced the inventories
- Two-way communication of questions and answers, not a one-way communication like examiner vs. examinee, or to criticize or audit each other's inventory

# History

	2011 WGIA9	2012 WGIA10	2013 WGIA11	2014 WGIA12	2015 WGIA13	2016 WGIA14	2017 WGIA15	2018 WGIA16	2019 WGIA17
<b>General</b>	-	-	-	-	Japan Vietnam	-	-	-	<b>China Singapore</b>
<b>Energy</b>	Indonesia Mongolia	Cambodia Thailand	Lao PDR Thailand	Indonesia Myanmar	-	Brunei Korea	Mongolia Vietnam	India Vietnam	<b>Thailand Japan</b>
<b>IP</b>	-	Indonesia Japan	-	-	-	Malaysia Myanmar	-	-	-
<b>Agriculture</b>	-	Indonesia Vietnam	China Myanmar	China Mongolia	Indonesia Lao PDR	-	-	-	<b>Cambodia Philippines</b>
<b>LULUCF</b>	Japan Lao PDR	-	-	Vietnam	Cambodia Mongolia	Indonesia Lao PDR	Lao PDR Myanmar	-	-
<b>Waste</b>	Indonesia Cambodia Korea	China Korea	Malaysia Vietnam	-	Korea Myanmar	Mongolia Thailand	China Philippines	Japan Lao PDR	-

- Trial implementation between Japan and Korea since 2008
- Introduction to ML activity on WGIA 8
- Added as official programme into WGIA since 2011(WGIA9)
- All regular 15 countries have finally experienced the ML.



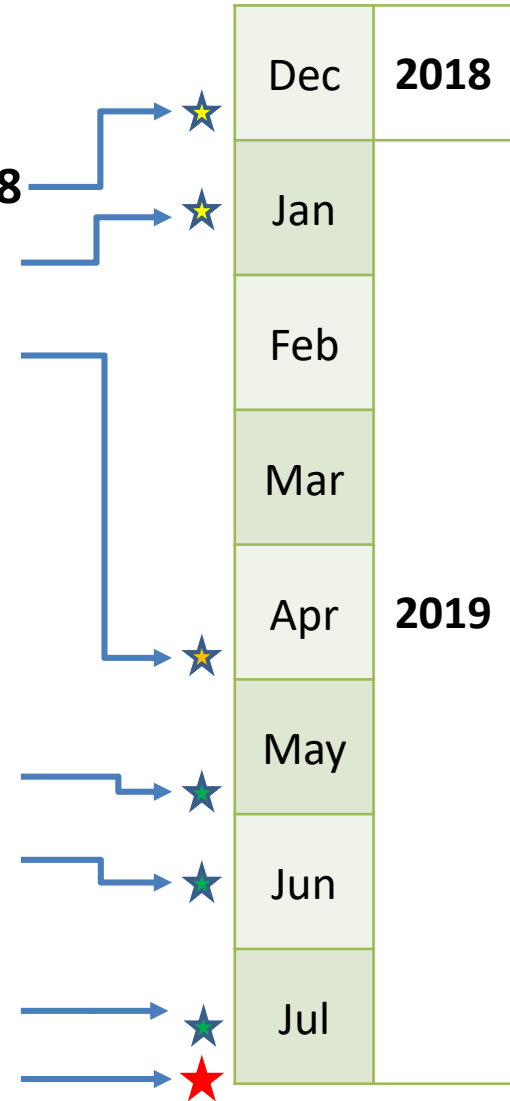
# Procedure of ML

## • Preliminary process

- Announcement : December 2018
- Application : January 2019
- Determination of partner : Late April

## • Main process

- Submission of materials : Late May
- Material Exchange : June  
[Learning the materials :During June]
- Comments and answers exchange : July
- Sessions : 30 July



# Comment exchange

## 1. Category: Solid Waste Disposal on Land

<input type="checkbox"/> Methodology	<input type="checkbox"/> Emission Factor	<input checked="" type="checkbox"/> Activity Data	<input type="checkbox"/> Other
<b>Question or Comment:</b>			
Could you show the amount of landfills by waste type and by year in table form?			
<b>Answer:</b>			
See attached file; it is a confidential data. Please keep a secret.			

<input type="checkbox"/> Methodology	<input type="checkbox"/> Emission Factor	<input type="checkbox"/> Activity Data	<input checked="" type="checkbox"/> Other
<b>Question or Comment:</b>			
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 standards of 'Managed landfill' of 2006 IPCC G/L?			
<b>Answer:</b>			
Our 'Managed Landfill' meets the standard of 2006 Guidelines. Please refer for details to the 'Ministerial Ordinance on Technical Standards for Final Disposal Sites of Municipal and Industrial Waste.' ( <a href="http://law.e-gov.go.jp/html/data/S52/S52F03102004001.html">http://law.e-gov.go.jp/html/data/S52/S52F03102004001.html</a> ).			

<input type="checkbox"/> Methodology	<input type="checkbox"/> Emission Factor	<input type="checkbox"/> Activity Data	<input checked="" type="checkbox"/> Other
<b>Question or Comment:</b>			
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?			
<b>Answer:</b>			
We estimate XXXX,XXXXXXXXXXXXXXXXXXXXXXXXXXXX.			
Items	Half life (y)	K value	Uncertainty of k value (%)
Kitchen garbage	***	***	***
Waste paper	***	***	***
Waste textile (natural fiber)	***	***	***
Waste wood	***	***	***
Sludge	***	***	***

## ■ 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 during WGIA17

Sector	Country	Number of Participants
General	China	2
	Singapore	7
Energy	Thailand	2
	Japan	3
Agriculture	Cambodia	7
	Philippines	3

A scene of the General sector session between China and Singapore



- 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
General	China	BUR2 in 2018 NC3 in 2018	Revised 1996 IPCC GLs/GPG	Tier 1, 2	CS, Default	Official statistics
	Singapore	BUR3 in 2018 NC4 in 2018	2006 IPCC GLs	Tier 1, 2	Default	National sources
Energy	Thailand	Third NC	1996 IPCC GLs	Tier1	Default (CS NCV)	National statistics
	Japan	2019 NIR	2006 IPCC GLs	Tier 1, 2, 3	CS, Default	National statistics
Agriculture	Cambodia	Draft of National GHG Inventory	2006 IPCC GLs	Tier 1, 2	CS, IPCC Default	National statistics, Literature data
	Philippines	Drafted Agriculture sectoral report 2010	2006 IPCC GLs	Tier1	IPCC Default	National statistics, Special studies





# 1. General (1)

## (China and Singapore)

### ■ Issues and solutions / Outstanding issues

- Challenges are faced in acquiring Tier 2a activity data for certain sub-applications.
- Challenges are faced in collecting and estimating activity data for the historical time-series.
- Production/consumption data of F-gases, including HFCs for the inventory is based on surveys of voluntarily provided data from enterprises and expert estimation.



# 1. General (2)

## (China and Singapore)

### ■ Good practices

#### China

- The leading department invited experts who were not involved in the preparation of the inventory to carry out independent analysis and review of the inventory methodologies and results.
- In order to improve information from enterprises, meetings of relevant enterprises are convened to raise awareness about how to fill out survey forms.
- Some historical statistics can be utilized for F-gas estimations in academic research, that will inform inventory making in the future.
- Good collaboration between academic institutions/industry/government in the collection and compilation of HFC data.



# 1. General (3)

## (China and Singapore)

### ■ Good practices

#### Singapore

- The quality control checks are done on inventory emissions estimations, and audits are conducted on company's Emissions Report.
- Taxable companies covered under the Carbon Pricing Act are required to provide a monitoring plan to NEA and their emission report would be verified by a third party verifier.
- A quality assurance team that is not involved in the collection and compilation of the GHG emissions conducts a review of the inventory compilation process.
- An interim Tier 1b study on HFC emission estimation for RACs was conducted to improve the coverage and reporting of F-gases.
- There is a structured and organized team of GHG compilers for the national inventory.



# 1. General (4)

## (China and Singapore)

### ■ Follow-up activity

- Participate in ML again to report progress of the identified issues

### ■ Suggestion for future ML

- Uncertainty assessment
- Time-series consistency



## 2. Energy sector (1) (Thailand and Japan)

### ■ Issues and solutions / Outstanding issues

- Default carbon EFs are applied for key categories.
- Limited information is provided regarding which EFs are applied: 1996GLs, 2006GLs or CS.
- Limited information is provided regarding what fuels are consumed by vehicle type in road transport.
- Data on landing/take-off cycles by aircraft type are not available.
  - Consider utilize ICAO data (distance on international flights, fuel consumption)
- Uncertainty of AD should be considered.



## 2. Energy sector (2) (Thailand and Japan)

### ■ Good practices

- Country-specific net calorific values are applied.
- Consumption and NCV of biomass-blended fuels are collected and used.
- The IPCC Software is used to verify their own estimation.
- Time-series data are available from 2000 to 2013, including the base year of NDC, 2005.
- Recalculation was done in TNC from SNC.
- The 2006 IPCC GL will be applied for the next BUR.
  - The default value of EF in fugitive emission category will be changed from the 1996 to the 2006 IPCC GL.
  - To separate bio-fuel from gasoline and diesel.
- Although emissions of manufacturing are aggregated in TNC, disaggregated data are available from 2000.

### ■ Follow-up activity

- Participate in ML again to know other countries' experiences



# 3. Agriculture (1)

## (Cambodia and Philippines)

### ■ Issues and solutions / Outstanding issues

- Development of the improvement plan (data collection gaps, methodology used) for Agriculture
- Capacity building for transparency such as technical training/workshop, webinar for data collection and analysis between data user and provider
- Development of CSEF and parameters for more accurate reporting
- Estimation is only done for single year
- Emission from rice paddy field may be able to apply Tier 2 Methodology
- The lack of QC has identified



# 3. Agriculture (2)

## (Cambodia and Philippines)

### ■ Good practices

#### Cambodia

- The 2006 IPCC Guidelines were applied
- Emissions are estimated for the whole time series
- Using spread sheets including explanation of methodology for the purpose of transparency
- Establishment of CSEF of manure management (swine)

#### Philippines

- The 2006 IPCC Guidelines were applied
- QC plan in place
- A Sectoral GHG Inventory report is independently prepared
- An online data set is publicly available, for the purpose of transparency and archiving
- GHG Inventory management and reporting system is institutionalized





# 3. Agriculture (3)

## (Cambodia and Philippines)

### ■ Follow-up activity

- Applying CSEF based on IRRI data and using enhanced characterization for livestock species
- Participate in ML again to report progress of the identified issues
- Monitoring the gaps of technical capacity and time series data based on the improvement plan in place
- Search / comparison / confirmation of the available EF data suits the country situation among various data sources

### ■ Suggestion for future ML

- Establishment of the condition to be able to exchange the information to reflect the emission reduction based on mitigation action
- Continuous communication with other countries for sharing data and best practices



Please take advantage of  
this opportunity  
to improve your  
inventory compilation !

