4.2 Workshop on Capacity Development Role for GHG Inventory Preparation in ASEAN countries (7 Aug 2014)

Greenhouse gas Inventory Office of Japan

Wrap-up of WGIA 12

Elsa Hatanaka
Greenhouse Gas Inventory Office of Japan (GIO)
Center for Global Environmental Research (CGER)
National Institute for Environmental Studies (NIES)

Workshop on Capacity Development Role for GHG Inventory Preparation in ASEAN Countries

7 August 2014

WGIA

- Capacity building for Measurability, Reportability and Verifiability -

Workshop title:	Workshop on Greenhouse Gas Inventories in Asia (WGIA)
Objective:	To support countries in Asia to improve the quality of inventories via regional information exchange
Organizers:	Ministry of the Environment of Japan National Institute for Environmental Studies
Participating countries:	Cambodia, China, India, Indonesia, Japan, Republic of Korea, Lao P.D.R., Malaysia, Mongolia, Myanmar, Philippines, Singapore, Thailand, Vietnam (14 countries)
Style:	Annual workshop since 2003
Funds:	Ministry of the Environment of Japan

Workshop flow

Day 1: 4th August, Monday

- Mutual learning (Closed session)
- SEA project informal meeting (Closed session)

Not covered in the following presentation

- Opening session
- Session I: Progress of National Communication (NCs), Biennial Update Reports (BURs) and International Consultation and Analysis (ICA) for BUR

Day 2: 5th August, Tuesday

- Session II: Quality Assurance/Quality Control (QA/QC) activities in Preparation of NCs and BURs
- Session III: Sectoral Working Group Sessions

Not covered in the following presentation

  - Working Group Session 1: Cross-cutting (GHG Inventories at various levels)
  - Working Group Session 2: AFOLU

Day 3: 6th August, Wednesday

- Session IV: Enhancement of Network for Supporting Measurement, Reporting and Verification (MRV) at various levels
- Wrap-up session
- Joint Meeting of the WGIA Organizing Committee (OC) and Advisory Board (AB) (Closed session)

Back-to-back Event: 7th August, Thursday

- GHG inventory workshop: how to meet the capacity building needs in ASEAN

Wrap-up Session: Summary of the Opening Session and Session I, II, and IV

Chair of the Opening Session: Mrs. Prasertsuk Chamornmarn
Chair of Session I : Dr. Retno Gumilang
Chair of session II : Dr. Baasansuren Jamsranjav
Chair of session IV : Dr. Sumana Bhattacharya

Rapporteur: Elsa Hatanaka (NIES/CGER/GIO)

WGIA12, 4-6 August 2014

Opening Session

Presentations

- Dr. Takefumi Oda (GIO)
  - Overview of WGIA12
- Mr. Yu Kamei (MOEJ)
  - Japan's climate change policies
- Dr. Natthanich Asvapoositkul (ONEP, Thailand)
  - Thailand's climate change policies

Opening Session

Interest was shown and clarifications were sought on:

Japan's

- L^2-Tech-JAPAN Initiative to promote leading and low-carbon technologies
- Finance scheme for JCM (Joint Crediting Mechanism) projects

Thailand's

- Process and challenges of making the DRAFT Climate Change Master Plan (2013-2050)
- Mid-term goal of reducing GHG emissions 7 to 20 % by 2020 compared to BAU, for the energy and transportation sectors

NCs, BURs, ICA, and QA/QC

The following was shared in Session I & II:

- Reporting requirements and MRV framework under the UNFCCC
- Support available from international organizations
- QA/QC activities
  - ✓ their possible relevance to ICA for BURs under UNFCCC
  - ✓ documented in NCs – ASEAN countries
  - ✓ new tool for QA/QC – FAOSTAT Emissions Database
  - ✓ Lao PDR's experience with its SNC

Decision 1/CP.16 Reporting requirements under the UNFCCC for NAI Parties

Enhanced reporting- paragraph 60-66

Frequency for national communications

a) Submission every four years

Submit biennial update reports (BURs)

a) Updates of national GHG inventories/report
b) Mitigation actions/ their effects
c) Support needed & received

International Consultation and Analysis (ICA)

a) BURs
b) Modalities and guidelines

Ms. Alma Jean's presentation in Session I

Decision 2/CP.17

Reporting requirements under the UNFCCC for NAI Parties

- Adopted
  - a) Guidelines for the preparation of biennial update reports (Annex III)
  - b) Modalities and guidelines for ICA (Annex IV)
- Submission
  - a) NAI Parties should submit their first BUR by December 2014
  - b) Subsequent BUR shall be submitted every two years
    - Summary of parts of NC
    - Stand alone update report

- Inventory year
  - a) Minimum, no more than four years prior to the date of submission/more recent
  - b) Subsequent…does not precede by more than four years
- Enhanced support (AI):
  - a) First round of the ICA (NA-I) will commence within six months of submission of the first round of BUR
  - b) The guidelines should be reviewed and revised as appropriate/COP Decisions

Ms. Alma Jean's presentation in Session I

Support available internationally

- Technical assistance from the Consultative Group of Experts (CGE), global/regional training workshops etc

Presentation by Ms. Alma Jean in Session I

- GEF's financial assistance through programmes like the following:
  - ➢ UNEP-GEF Global Support Programme for Preparation of NCs to the UNFCCC (up to USD$500,000 through expedited procedures)
  - ➢ UNEP-GEF Global Support Programme for Preparation of BURs (up to USD$352,000)

Presentation by Mr. Conrado Heruela in Session I

QA/QC activities (1)

Presentation by Mr. Kiyoto Tanabe (IPCC-TFI-TSU) in Session II

- Quality Control: routine technical activities performed by personnel compiling the inventory
- Quality Assurance: review procedures conducted by personnel not directly involved in the inventory compilation
- QA/QC procedures as integral parts of the inventory process to ensure "TCCCA"

Transparency
Completeness
Consistency
Comparability
Accuracy

➢ ICA process as QA?

→ Probably more a new opportunity for quality improvement of GHG inventories and BURs

QA/QC activities (2)

Presentation by Mr. Conrado Heruela (UNEP) Mr. Francesco Tubiello (FAO) in Session II

➢ QA/QC, mentioned in NCs?

→ Some ASEAN countries – 1) data comparison etc with other countries done, 2) future needs discussed, but description is mostly brief

→ The remaining half of the countries - no description

- New tool for QA/QC – FAOSTAT Emissions Database
  - – IPCC 2006 GLs Tier 1 estimates for Agriculture + Tier 1 Approach 1 estimates for Land Use, provided ONLINE

QA/QC activities (3)

Presentation by Ms. Thounheuang Buithavong in Session II

- Lao PDR's experience with its SNC
  - Recalculation at the final stage for key sources of emissions and removals – LULUCF and Agriculture
  - Mutual Learning with Japan – LULUCF sector
  - External Peer Review from UNDP and other international experts and experts in the region
  - National Steering Committee Review by experts not directly involved in inventory

Summary of Session I & II

Questions raised and points noted:

- ✓ Challenges faced to submit BUR by the end of this year, but good quality NCs and BURs will make funding possible from other financial mechanisms
- ✓ Co-ordination of capacity building needed
- ✓ How strict is the '- 4 years' requirement for inventory reporting in the BURs? >>> UNFCCC has clarified that, if submitted later than the deadline of Dec 2014, the reported year should be adjusted
- ✓ What exactly is the aim of ICA? >>> To increase the transparency of mitigation actions and their effects - calling for high quality GHG inventories
- ✓ The first step in the ICA process, the technical analysis of the BUR by the team of technical experts, is only supplementary to domestic QA

Summary of Session I & II (cont)

- ✓ QA/QC efforts should focus on key categories and recalculated categories, and categories where data and methodology change occurred, and focus should be given to pre-submission QA more than post-submission QA
- ✓ What should be included in BURs with regard to QA/QC? >>> At the discretion of the country, but sharing of good practices through BURs will be useful for other countries as well
- ✓ Documenting QA/QC activities is important - for continuity of reporting, and consistency in work for later teams to be put in charge

Strengthening the network and enhancing MRV (1)

The following information was shared in Session IV:

- Science-based low carbon development policy-making in Asia by LoCARNet
- Support activities related to MRV by APN
- Capacity building support related to MRV for local governments by IGES/KUC
- Capacity building support related to MRV by CITC
- Promoting the understanding of the MRV concept by IGES
- Support available through the Joint Crediting Mechanism by NEDO

Strengthening the network and enhancing MRV (2)

Presentation by Dr. Shuzo Nishioka

- Strong need to minimize the use of the remaining carbon budget, and move to a low carbon society - and Asia needs to be a key actor in the action. Good quality inventories contribute to achieving a low carbon Asia.
- APN's support for regional cooperation in global change research strengthens science/policy dialogue, and improves the scientific and technical capabilities in the region - including projects on GHG inventories and MRV systems.

Presentation by Dr. Jariya Boonjawat

- City governments play and important role for sustainable & low-carbon city development, and capacity building is needed (including that for GHG inventories). National governments could help, with their experience and support.

Presentation by Dr. Junko Akagi

Strengthening the network and enhancing MRV (3)

Presentation by Dr. Jakkanit Kananurak

- CITC established as a one-stop technical and training center for climate change mitigation and adaptation in the SE Asia region, offering knowledge in 1) GHG inventory management, 2) Mitigation mechanisms, 3) Low carbon society development, and 4) Sustainable GHG management
- MRV Guidebooks for developing countries, and for Policy Makers now available, with Q&A sections and best practices – editions to be continuously updated

Presentation by Mr. Kazuhisa Koakutsu

- The Joint Crediting Mechanism (JCM) aims at contributing to sustainable development by facilitating diffusion of leading low carbon technologies and implementing mitigation actions – feasibility studies and demo projects on-going

Presentation by Mr. Genichiro Sawamura

Summary of Session IV

Questions raised and points noted:

- ✓ Energy-use and economic growth need to be decoupled - Japan succeeded during the oil crisis to a certain extent, and hopes to support other Asian countries so that the opportunity to choose low-carbon development paths isn't lost
- ✓ MRV might be different by the size/type of municipality
- ✓ What are possible co-benefits of local mitigation actions? >>> Improvement in waste management, traffic management, health sector etc
- ✓ How are reference scenarios verified? >>> The JCM Joint Committee for each country will approve it, and a third party entity will check against GLs whether it is appropriate
- ✓ How do NAMA projects etc under the UNFCCC coincide with JCM reference scenarios? >>> JCM is at the project level and is different from NAMA reference levels
- ✓ Are there preferences of sectors for JCM projects? >>> The JCM Joint Committee for each country will take the decision.

Summary of Session IV (cont)

Questions raised and points noted: (cont)

- ✓ How can harmonization be done for local and national level inventories/mitigation actions? >>> Difficult, but national level policy implemented at the local level may be captured, or national level-use intended IPCC GLs and software may be used at the local level

- ➢ Generally, a strong interest was shown on the details of support available and the specifics of MRV implemented, together with interest for the harmonization between local and national, where local-level actions are reflected in national level inventories and low-carbon development decision-making. This knowledge-sharing will contribute to the planning and verification of NAMAs, and also help form the basis for Intended Nationally Determined Contributions (INDCs).

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GIO website: http://www-gio.nies.go.jp/index.html
WGIA website: http://www-gio.nies.go.jp/wgia/wgiaindex-e.html

Significance of GHG inventory development in Southeast Asia: Countries participating UNEP-GEF Support Programmes

Conrado S. Heruela
Task Manager, GEF CC Mitigation Portfolio
Division of Technology, Industry & Economics
Regional Office for Asia & the Pacific
UN Environment Programme
Bangkok, Thailand

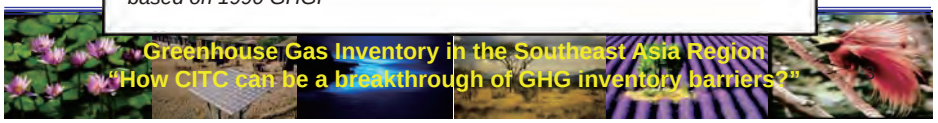
UNEP-GEF Global Support Programmes Status in participating ASEAN Countries

Country	INC	SNC	TNC
• Cambodia	8 Oct 2002	submitted	under prep'n
• Lao PDR	2 Nov 2000	24 Jun 2013	under prep'n
• Myanmar	26 Dec 2012	under prep'n	
• Viet Nam	2 Dec 2003	7 Dec 2010	under prep'n

Lao PDR 1st NATCOM (2000)
National Greenhouse Gas Inventory 1990*

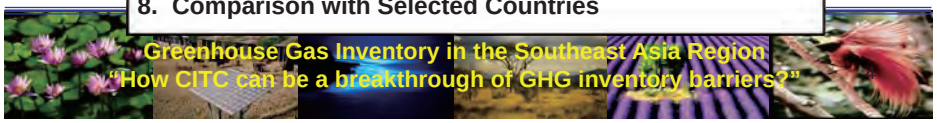
1. **Scope of the Study and Methodology**
2. **Time Periods**
3. **Energy – *by type of fuel: fossil fuel & traditional biomass***
4. **Agriculture – *rice production & livestock production***
5. **Forestry Sector – *changes in forestry & other woody biomass stocks; forest & grasslands conversion, abandonment of managed land***
6. **Waste - *landfills***
7. **Conclusions – *Lao PDR is net CO2 Sequester***

** based on 1990 GHGI*



Cambodia 1st NATCOM (2002)
National Greenhouse Gas Inventory 1994

1. **Methodology**
2. **Emission of GHG - *by types of fuels***
3. **Energy – *petroleum products & traditional biomass***
   - ***Fuel Combustion – 6 subsectors categories, with transport providing sub-sub-categories***
4. **Industrial Processes – *3 industrial subsectors***
5. **Agriculture – *5 agricultural source categories***
6. **Waste – *4 sub-sector categories***
7. **Land Use Change & Forestry - *GHG Emissions; Uptake due to Managed Forests (Removals)***
8. **Comparison with Selected Countries**



Viet Nam 1st NATCOM (2003)
National Greenhouse Gas Inventory 1994

1. Energy Sector - *Emission from Fuel Combustion (9 fuel-using sub-sectors); Fugitive Emissions (coal & oil exploitation)*
2. Industrial Processes - *8 industrial sub-sectors*
3. Forestry & Land Use Change - *Emissions & Uptakes by Types of Natural & Plantation Forests*
4. Agriculture - *Livestock; Rice Cultivation; Prescribed Burning of Savannah; Field Burning of Agricultural Residues; Agricultural Soil*
5. Waste - *Municipal Solid Wastes; Domestic, commercial & industry waste water*

Viet Nam 2nd NATCOM (2010)
National Greenhouse Gas Inventory 2000

1. Introduction
   a) Institutional Arrangements
   b) Methodology and data Sources
2. GHG Emissions
   a) Energy
      a) *Fuel Combustion by fuel types (coal, oil, gas & biomass) & by sub-sectors (6 sub-sectors)*
      b) *Fugitive Emissions – by type of fossil fuel extracted (coal, oil & gas) & by type of GHG emitted (CO2, CH4, N20).*
   b) Industrial Processes - *5 Industrial Subsectors (cement, lime, ammonia, carbide & steel)*
   c) *Agriculture – 4 Source categories (rice cultivation, livestock, agricultural soils & burning of agricultural residues)*
   d) Land use, land use change & forestry – *emissions/removals by type of forests (natural & planted)*
   e) Wastes – *4 sub-sectors/source category (solid waste, wastewater, industrial wastewater & human wastes)*
   f) Summary of national GHGI – *by GHG type & by sector*
   g) Uncertainty
   h) Analysis of main GHG emission sources & sinks
   i) Project emissions from main sources for 2010, 2020 & 2030

Lao PDR 2nd NATCOM (2013)
National Greenhouse Gas Inventory 2000

1. Scope, Time Frame & Methodology
2. Institutional Arrangements & Report Preparation Process
   a) Institutional Arrangements
   b) Process for Inventory Preparation
3. National Greenhouse Gas Inventory for 2000
   a) National GHG Emissions, by Gas
   b) National GHG Emissions, by Sector
      - Energy Sector
      - Industrial Processes
      - Agricultural Sector
      - Land-Use Change & Forestry
      - Waste Sector
   c) National GHG Emissions in CO2 Equivalent
   d) Comparison of GHG Inventories for 1990 & 2000 (CO2 Equivalent)
   e) Key Category Analysis
   f) Inventory Uncertainty
   g) Quality Assurance, Quality Control and Completeness

Summary of GHG Emissions, in CO_2 Eq

Source	Cambodia	Lao PDR	Viet Nam
Submission	INC 2002	SNC 2013	SNC 2010
GHGI Year	1994	2000	2000
Population	9.87M (1994)	5.62M (2005)	77.6M (2000)
Energy	1,881.35	1,039.76	52,773.46
Industries	49.95	48.41	10,005.72
Agriculture	10,560.15	7,606.34	65,090.65
LUCF	-17,906.54	41,916.52	15,104.72
Wastes	273.39	131.88	7,925.18
NET TOTAL	-5,141.79	50,742.91	150,899.74

Data Sources/*Issues*

Source	Cambodia	Lao PDR	Viet Nam
Submission	INC 2002	SNC 2013	SNC 2010
GHGI Year	1994	2000	2000
Energy	1996 Rev IPCC, national statistics	Nat'l stats & reports; experts' judgement	1996 Rev IPCC, national statistics
Industries	1996 Rev IPCC, + direct factory data	IPPC default values, nat'l stats	1996 Rev IPCC, + direct factory data
Agriculture	1996 Rev IPCC, Nat'l & Int'l Stats	IPPC values appear high for Lao PDR	MARD reports & statistics, country-specific EF for rice
LUCF	*Only forest stats*	Nat'l stats & reports; experts' judgement	MARD reports & statistics
Wastes	Nat'l & Int'l Stats	Most lacking in data	MONRE reports & statistics

Key Source Category Analysis

Source	Cambodia	Lao PDR	Viet Nam
Submission	**INC 2002**	**SNC 2013**	**SNC 2010**
GHGI Year	**1994**	**2000**	**2000**
GHG Emissions	CH_4, CO_2, N_2O	CH_4, CO_2, N_2O	CH_4, CO_2, N_2O
Energy	3%	2%	35%
Industries	0%	0%	6.6%
Agriculture	18%	15%	43.1%
LUCF	79%	83%	10.05
Wastes	0%	0%	5.3%

Inventory Uncertainty by Sector

Source	Cambodia	Lao PDR	Viet Nam
Submission	**INC 2002**	**SNC 2013**	**SNC 2010**
GHGI Year	**1994**	**2000**	**2000**
	Not done		presented separately
Energy		+/- 27.14	
Industries		+/- 13.98	
Agriculture		+/- 29.60	
LUCF		+/- 44.03	
Wastes		+/- 31.57	

Inventory Uncertainty by Type of GHG

Source	Cambodia	Lao PDR	Viet Nam
Submission	**INC 2002**	**SNC 2013**	**SNC 2010**
GHGI Year	**1994**	**2000**	**2000**
	Not done		Presented separately
CH4		+/- 27.14	
CO2		+/- 26.75	
N2O		+/- 34.62	

Uncertainty Assessment
Viet Nam NATCOM 1994 & 2000

	1994	2000
Total emissions (thousand tonnes of CO_2e)	103,839	150,900
Contribution to uncertainty variance by category	396.5	221.6
Emissions variance (thousand tonnes of CO_2e)	± 20,672	± 22,465
Uncertainty (%)	19.9	14.9
Total emissions with uncertainty (thousand tonnes of CO_2e)	103,839 ± 20,672	150,900 ± 22,465
Emission trends uncertainty for 1994–2000 (%)	19.5 (2000: ± 9,162 thousand tonnes of CO_2e)	

QA/QC & Completeness

Cambodia	Lao PDR	Viet Nam
INC 2002	SNC 2013	SNC 2010
GHGI 1994	GHGI 2000	GHGI 2000
✓ Country Comparison	✓ Re-Calculation ✓ Peer Review ✓ External Expert Review ✓ National Steering Committee Review	Report does not mentioned any QA/QC activity

GHG Projections

Source	Cambodia	Lao PDR	Viet Nam
Submission	INC 2002	SNC 2013	SNC 2010
GHGI Year	1994	2000	2000
Projection Yrs	2000, 2010, 2020	No projections	2000, 2010, 2020 Only a summary was presented, which included a linear graph projection for all sectors, no discussion of methodology
Energy	up to 2030 (LEAP)		
Industries	*no projections*		
Agriculture	CH_4, N_2O		
LUCF	forests only		
Wastes	human , solid wastes		

Mitigation Actions Identified

Source	Cambodia	Lao PDR	Viet Nam
Submission	INC 2002	SNC 2013	SNC 2010
Energy	8 options identified, 3 scenarios analysed	3 options identified, including transport	15 options were analysed
Industries	none	4 options identified , cement sector analysed	Some options in "Energy" also for industries
Agriculture	1 option (rice cultivation)	5 options , identified 2 options analysed	5 options were analysed
LUCF	5 options, 3 scenarios	8 options identified, by forest area scenarios	8 options were analysed
Wastes	none	7 options identified	none

Table 4.6. Mitigation potential and cost of 28 options in energy, agriculture and LULUCF

Option	Abbreviation	Mitigation potential (million tCO_2)	Mitigation cost (US$/$tCO_2$)
Replacing coal with LPG in household cooking	E2	22.0	23.80
Wind power replacing coal-fired thermal power	E14	14.2	16.20
Switching from coal-fired to LNG thermal power	E12	16.0	15.10
High-efficiency refrigerators	E3	7.3	12.30
Biogas replacing cooking coal in mountain areas	A2	5.2	9.70
Rice paddy field water drainage in South Central Coast	A4	4.1	7.00
Rice husk power replacing coal thermal power	E15	6.9	6.60
Rice paddy field water drainage in the Red River delta	A3	21.9	5.20
Biogas replacing cooking coal in lowlands	A1	17.4	4.10
Planting short-rotation pulpwood forest	F6	176.0	1.38
Protection and sustainable management of existing production forest area	F1	904.0	1.36
Planting short-rotation trees for lumber	F5	296.0	0.81
Conservation of existing protection forests	F2	1,153.0	0.77
Planting melaleuca forest on alkaline wetlands	F8	25.0	0.59
Planting long-rotation large timber trees	F4	271.0	0.55
Growing long-rotation non-timber-product forest	F7	117.0	0.48
Reforestation of large timber forests in conjunction with natural regeneration	F3	80.0	0.38
High-efficiency air conditioner	E5	9.9	-4.40
Innovative brick kilns	E8	14.2	-5.10
Solar water-heating appliances	E6	13.9	-6.20
Small-scale hydropower replacing coal thermal power	E13	15.3	-7.20
Energy-saving compact fluorescent light bulbs	E4	23.4	-8.20
MUB cattle feeds	A5	7.9	-10.90
LPG-fuelled cabs	E10	3.3	-11.00
Switching from DO to CNG in transportation	E9	2.1	-14.10
Innovative coal stoves	E1	25.3	-17.40
Using high-press sodium lamps in public lighting	E11	2.9	-22.80
High-efficiency electric motors	E7	15.5	-24.90
Total		**3,270.7**	

Viet Nam SNC 2010 Result of Mitigation Potential Analysis

Inputs to:

- GEF 6 Climate Change Mitigation Projects
- NAMAs
- GCF project concepts?

Capacity Building Needs
Cambodia INC 2002

- ✓ Training on basic environment concepts and economics of climate change projects;
- ✓ In-depth technical trainings on GHG mitigation analysis and vulnerability and adaptation assessment;
- ✓ Energy data development (demand analysis, forecasting);
- ✓ Advanced English language training, and training on negotiation skills.

Capacity Building Needs
Lao PDR SNC 2013

- ✓ Inadequate and inaccurate information and inactivity data
- ✓ Lack of local emission factors
- ✓ Inadequate capacities of local researchers among relevant agencies
- ✓ Poor database to support inventory activities
- ✓ Insufficient coherence & coordination
- ✓ Development of regular inventory preparation programme

Capacity Building Needs
Viet NAM SNC 2010

- ✓ **Related information and activities data for GHG inventory are inadequate, with built-in uncertainties and data management lacks coherence.**
- ✓ **The data collection process is slow. Data verification and validation are not undertaken on a continuous basis.**
- ✓ **The data collection system for greenhouse gas inventory is incomplete. A focal agency responsible for the national inventory's data collection, analysis, verification and update has not been established or designated.**
- ✓ **Research, assessment and verification for certain country-specific emission factors remains incomplete.**
- ✓ **A database supporting the inventory is not yet available.**
- ✓ **There is an inadequate pool of greenhouse gas inventory technical experts in the ministries and agencies. Inter-agency coordination remains to be desired.**

Thank You!

UNEP-ROAP Contact:
Conrado Heruela
E-mail: conrado.heruela@unep.org

Website: www.unep.org/gef

Capacity development needs and relevant IPCC TFI activities

Workshop on Capacity Development Role for GHG Inventory Preparation in ASEAN countries
7 August 2014, Bangkok, Thailand

Kiyoto Tanabe, Technical Support Unit
IPCC Task Force on National Greenhouse Gas Inventories

WMO UNEP

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INTERGOVERNMENTAL PANEL ON climate change

Capacity development needs on national GHG inventories

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INTERGOVERNMENTAL PANEL ON climate change

GHG Inventory – still challenging

Results of Survey Analysis by CGE in 2010

"Although developing country experts have been provided with various kinds of technical assistance, the survey results showed that GHG inventory is still recognized as one of the most challenging sections of the national communication, and that providing non-Annex I Parties with technical assistance is still considered necessary."

[FCCC/SBI/2010/21/Add.1, paragraph 17]

Many NAI Parties have made progress since 2010, but GHG inventory seems to be still challenging.

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Difficulties with data collection

Difficulties with activity data

- ✓ Obtaining activity data for the first time – Difficult
- ✓ Updating activity data - less difficult but still a problem

Difficulties with emission factors

- ✓ Obtaining appropriate (country-specific) emission factors - Difficult

Barriers to data collection

- ✓ Lack of a legal framework that mandates the provision of data
- ✓ Inadequate institutional arrangements to ensure data collection

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Insufficient institutional capacity

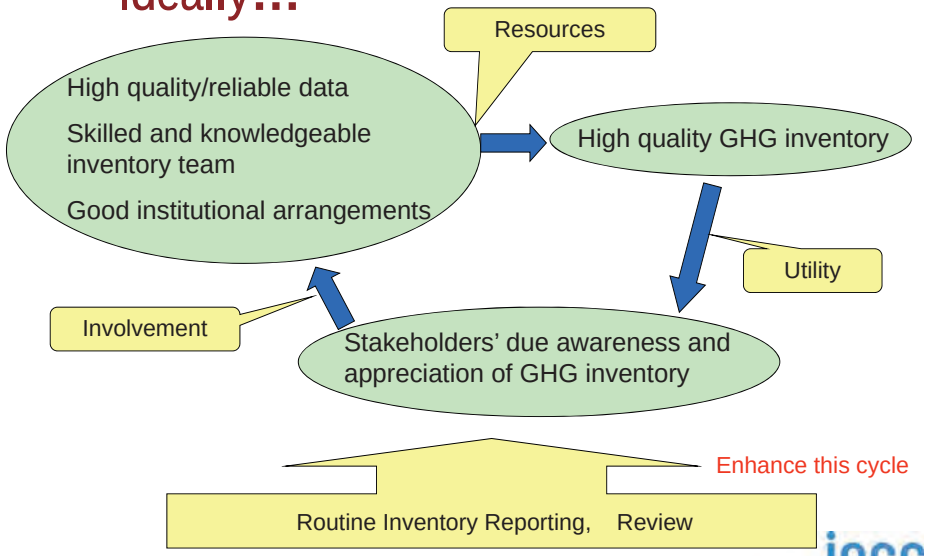
Insufficient number of experts

✓ Recourse to external experts

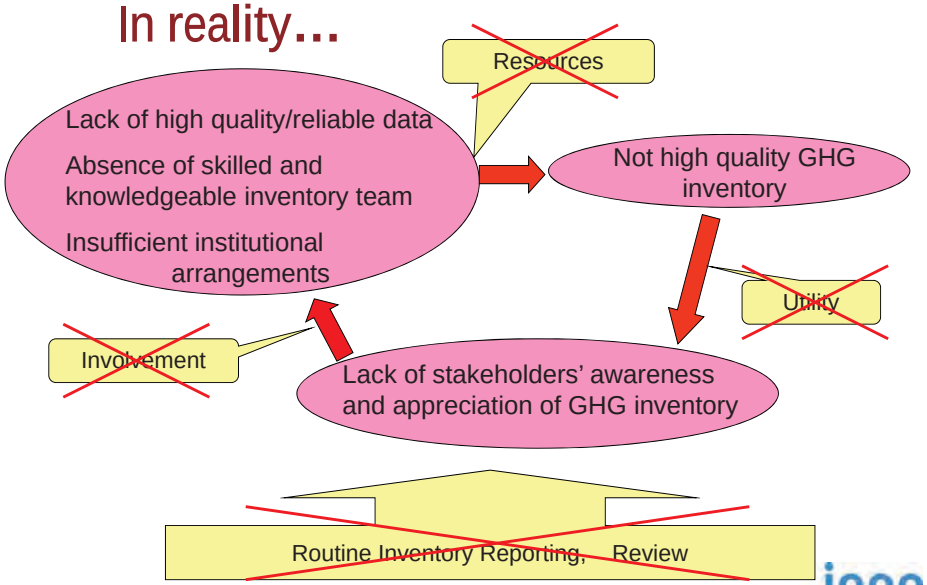
Difficulties with continuous GHG inventory preparation

✓ Lack of institutional arrangement to support continuity of inventory preparation activities
✓ Insufficient management to retain internal experts
✓ Lack of documentation and archiving of information used in preparing previous inventories
✓ Lack of experience in data management system as well as QA/QC

Ideally…



In reality…



Good institutional arrangements with trained experts are essential!!

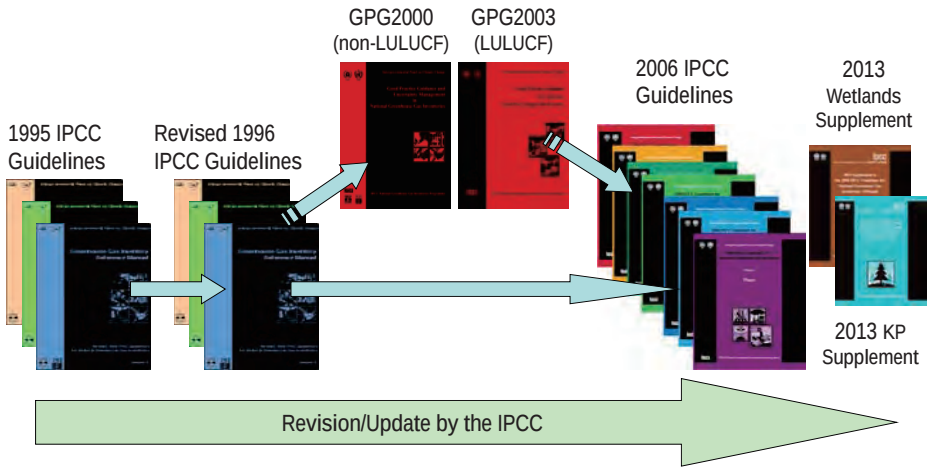
Capacity-building is necessary to enhance not only individual but also institutional capacity.

Training national experts should be essential to sustainable inventory preparation and management.

Activities of IPCC Task Force on National Greenhouse Gas Inventories

... will assist inventory compliers in developing their capacities on national GHG inventories

Evolution of IPCC Guidelines



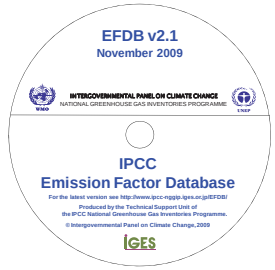
Primer for 2006 IPCC Guidelines

- Primer for 2006 IPCC Guidelines
  - Available from TFI website (see below)
  - Summary of the basic approach for inventory development and guidance on their use
  - Easy to read – expected to serve as quick guidance on 2006 IPCC Guidelines

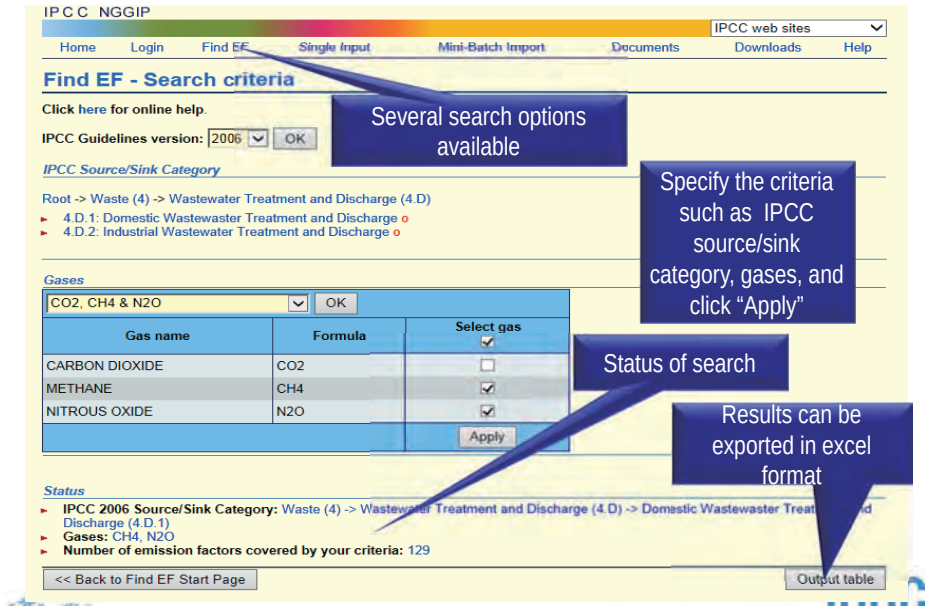
http://www.ipcc-nggip.iges.or.jp/support/support.html

Emission Factor Database (EFDB)

- Emission Factor Database (EFDB)
  - Library of a wide range of well-documented emission factors and other parameters to help users (inventory compilers) select those that best reflect their national circumstances
  - Supplements all the IPCC Guidelines/GPG
  - Available through the internet and in the form of CD-ROM
  - Efforts being continuously made to get a wider range of EFs (expert meetings for data collection, literature search, etc.)
  - Open to relevant data proposals – New proposals welcomed!!
    - New data will be evaluated for acceptance by EFDB Editorial Board.



http://www.ipcc-nggip.iges.or.jp/EFDB/

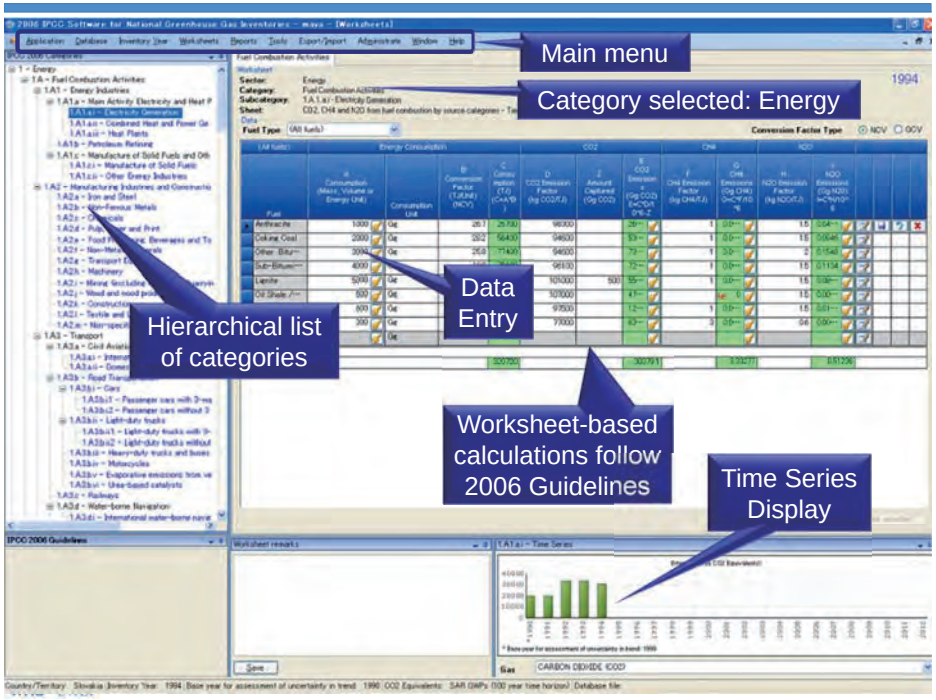


IPCC Inventory Software

- The latest version was released on 28 Nov 2013.
- It implements the 2006 IPCC Guidelines, but it can also be used for reporting under the Revised 1996 IPCC Guidelines.
  - Countries can use the improved methods and updated default data.
- It can be used for the whole inventory or individual categories.
- It includes Uncertainty & Key Category Analysis and aids QA/QC
- Will output in Non-Annex I National Communications format
- It improves on earlier software.
  - It is stand-alone – does not depend on specific versions of MS Windows or MS Office.
    - Does not require internet access or expensive hardware

Free!

http://www.ipcc-nggip.iges.or.jp/software/index.html

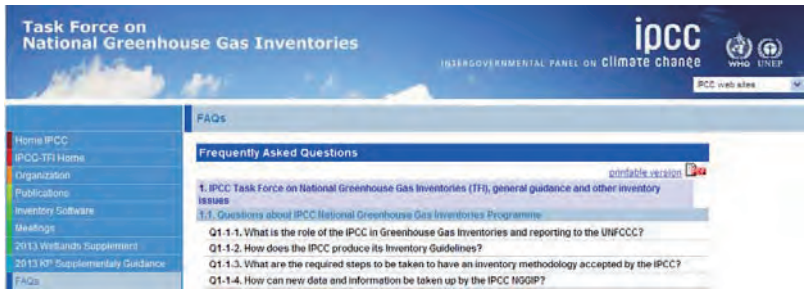


FAQ Website

- Answers to Frequently Asked Questions (FAQs) such as:
  - Q1-3-2: "What is the difference between accuracy and precision? Does uncertainty assessment relate to both?"
  - Q2-10: "According to the IPCC Guidelines CO_2 Emissions from the combustion of biomass are reported as zero in the Energy sector. Do the IPCC Guidelines consider biomass used for energy to be carbon neutral?"

❖Continuously updated

http://www.ipcc-nggip.iges.or.jp/faq/faq.html

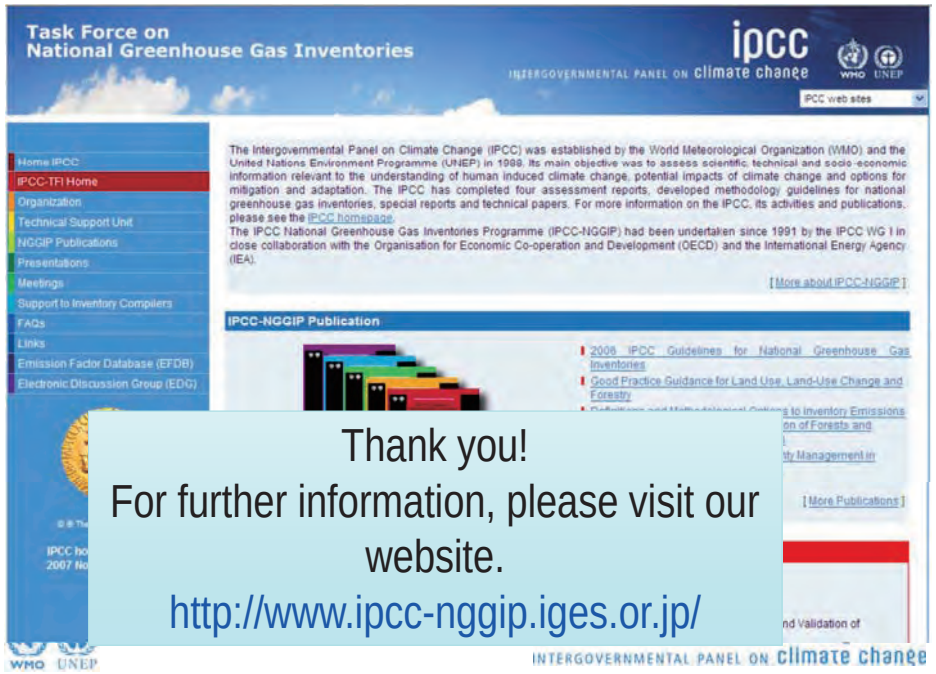


Other recent activities

- Expert meetings to promote the IPCC Guidelines and tools
  - Provided opportunities for inventory compilers (particularly those from developing countries) to be familiarized with the 2006 IPCC Guidelines and the relevant tools (IPCC Inventory Software, EFDB, etc.)
    - Expert Meeting on the 2006 IPCC Guidelines and Software (12-14 December 2012, Bali, Indonesia)
    - Expert Meeting: Improving National Greenhouse Gas Inventories Using the 2006 IPCC Guidelines and Related Tools (11-13 December 2013, Sapporo, Japan)

WMO UNEP

ipcc
INTERGOVERNMENTAL PANEL ON climate change



Thank you!
For further information, please visit our website.
http://www.ipcc-nggip.iges.or.jp/

Current Status of GHG Inventory Development in Thailand

Prasert Sirinapaporn

Director of Climate Change Management and Coordination Division,
Office of Natural Resources and Environmental Policy and Planning (ONEP)

Funding

- Thailand has submitted the TNC&BUR1 proposal to GEF in April 2013 (GEF agency: UNDP)
- GEF Council approved Thailand proposal on 5 Sep 2013 with programmable budget 852,000 USD
- 1st budget has been allocated to Thailand on July 2014
- *Additional financial support*:
  Low carbon capacity building project (LECB) from UNDP

National Inventory Improvement Plan

National inventory of GHG emissions for TNC/BUR1 will be focus on..

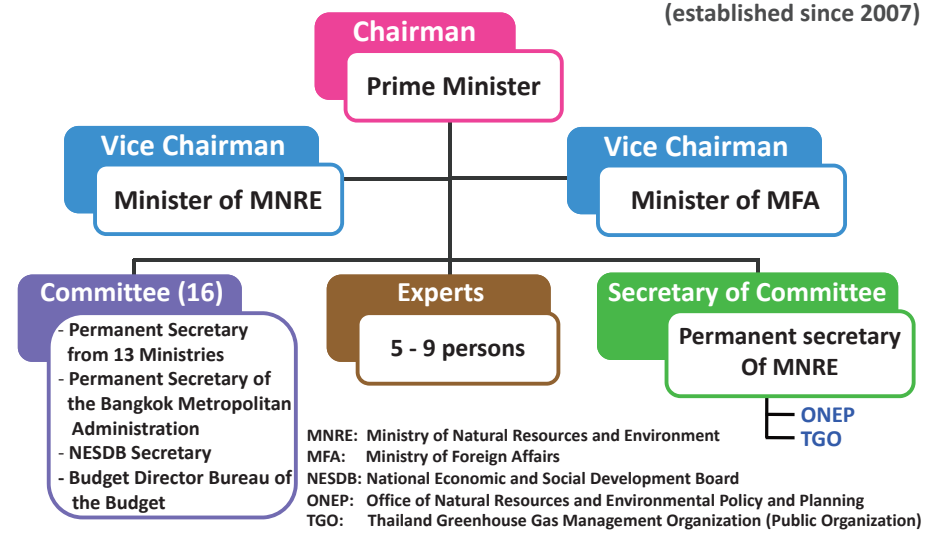
- Enhancement of capacity of the inventory taskforce
- Development of data archiving for activity data and emission factors including reporting system
- Estimation of 2011 GHG inventory of Thailand for BUR1 and 2013 for TNC
  (using *Revised 1996 IPCC Guideline*)

National Inventory Improvement Plan

- Setting up the 5 Ad Hoc Working Groups for 5 sectors which are energy, IPPU, Agriculture, LULUCF and waste sectors composting of relevant agencies who generate & collect data
- At initial state, each Ad Hoc Working Group will be advised by the experts who are specialists for each sector
- Data quality control (QC) will be responsible by TGO
- Data assurance (QA) will be performed by Climate Change Technical Sub-committee.

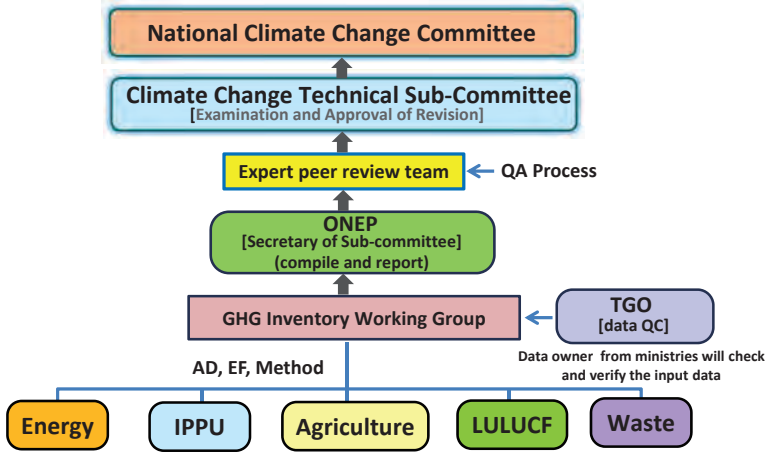
National Climate Change Committee

(established since 2007)



MNRE: Ministry of Natural Resources and Environment
MFA: Ministry of Foreign Affairs
NESDB: National Economic and Social Development Board
ONEP: Office of Natural Resources and Environmental Policy and Planning
TGO: Thailand Greenhouse Gas Management Organization (Public Organization)

Thailand Institutional Arrangement for GHG Inventory



Quality Assurance and Quality Control (QA/QC)

- **Quality control (QC) :** The procedures for quality control of Thailand are designed to provide routine technical checks to measure and control the quality of greenhouse gas inventory; to ensure data consistency, integrity, correctness and completeness and also to identify and address errors and emissions. The quality control checks include:
  - checking for transcription errors in data input
  - checking that emission and removals are estimated and calculated correctly
  - checking that proper conversion factors were used
  - checking that all sources and sinks have been accounted for
  - checking appropriateness of emissions factors

Quality Assurance and Quality Control (QA/QC)

- Thailand has designed GHG data checking in these processes;
  - Data collection
  - Data consolidating and processing
  - Data transmission
  - Data reporting

Quality Assurance and Quality Control (QA/QC)

- **Quality assurance (QA);** Thailand has planned to have a system of review procedures conducted outside the actual inventory compilation by personnel not directly involved in the inventory development process.
- It is a non-biased, independent review of methods and/or emissions estimates to ensures that the inventory continues to incorporate the most current scientific knowledge and data available.
- Therefore the Expert peer review team has been decided to review the inventory calculations, assumptions, and audits to the quality of the GHG inventory and to identify where improvements could be made. Then it will be approved by the Technical Sub-Committee.

Gap/challenges

- Lack of resources such as personal, financial, technical, and capacity supports for ad hoc working groups and related agencies
- Strengthening Ad Hoc working groups & capacity building for related agencies
- Set up the domestic verification procedure and system
- Strengthen data archived system

Gap/challenges

- Lack of some data
- The relevant data come from different sources, various organizations, and many standards.
- Those data are collected in accordance with their own demand not directly provide for the national GHG inventory system. So it would be difficult to reformate data for GHG inventory.
- 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 in other agencies

Gap/challenges

- 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.
- Those requirements need huge amount of financial support , capacity building and manpower for developing and continuing system operation which are the key challenges on national inventory system.
- Difficulties in data linkage between GHG inventory and GHG mitigation measures.

..Thank you..

ขอบคุณครับ

Prasert Sirinapaporn
Tel: +66 2 265 6500
Fax: +66 2 265 6692
Email: prahpart@yahoo.com

Workshop on Capacity Development Role
for GHG Inventory Preparation in ASEAN countries

7th August 2014
Bangkok, Thailand

How can training facilitate to breakdown the barriers on GHG inventory preparation

H.E. Dr. Paris Chuop
Deputy Secretary-General, National Council for Green Growth,
Ministry of Environment, Cambodia

Introduction

- Non Annex I countries have obligation to prepare and submit national GHG inventory to UNFCCC every year and in summary form every two years as part of CN and BUR.
- Ministry of Environment (MOE) wishes to enhance the ownership to regularly prepare and submit those obligations.
- Climate Change Department under MOE plays important role in coordination with line ministries for those assignments.

Current Update

- Capacity Building:
  - In-country training programmes were conducted for national technical staff/experts from key line ministries *(SEA GHG Project Phase 1 (2007 – 2010))*
  - Midterm review was participated by national expert on 8-10 October 2013 in Manila *(SEA GHG Project Phase 2)*
  - Capacity building on GHG inventory through exchange of knowledge and experiences *(WGIA programme)*
  - A series of trainings related to GHG inventory and MRV were participated by national experts at regional level *(USAID programme)*

Current Update

- MOE will establish very soon a permanent National GHG Inventory team (25 people) who members from line ministries including Environment, Agriculture, Forestry, Energy, Industry, Transport, Phnom Penh Municipality, relevant Universities, and others.
- USAID project will provide 5 sets of computer for database purpose.

Gaps

- Coordination and communication with line ministries/agencies.
- Technical capacities on preparing national GHG inventory on the choice of estimate method, data collection, data processing and achieving, and QA/QC

Needs

- Fully agreed with finding presented by previous speakers and delegate from UNEP in this morning.
- Priority: Request JICA, TGO, CITC, NIES, UNEP… to consider supporting and providing a series of professional training from beginning to advance on both theories and practices (theory session abroad and practical work in a pilot site of Cambodia) to the Cambodia National GHG Team, so that ownership in the preparation of CNs and BURs can be enhanced and those documents can be regularly submitted.

Workshop on Capacity Development Role for GHG Inventory Preparation in ASEAN countries

Current Updates and Barriers of GHG Inventory Development in Vietnam

Nguyen Trong Hung
Ministry of Natural Resources and Environment
Vietnam

Bangkok, Thailand
7th August 2014

Outline

- ✓ Introduction
- ✓ Current Updates
- ✓ Constraints
- ✓ Necessary supports

Introduction

✓ **National Strategy on Climate Change (2011)**
- ✓ Reduce 5-8% of the total energy consumption from 2011-2015

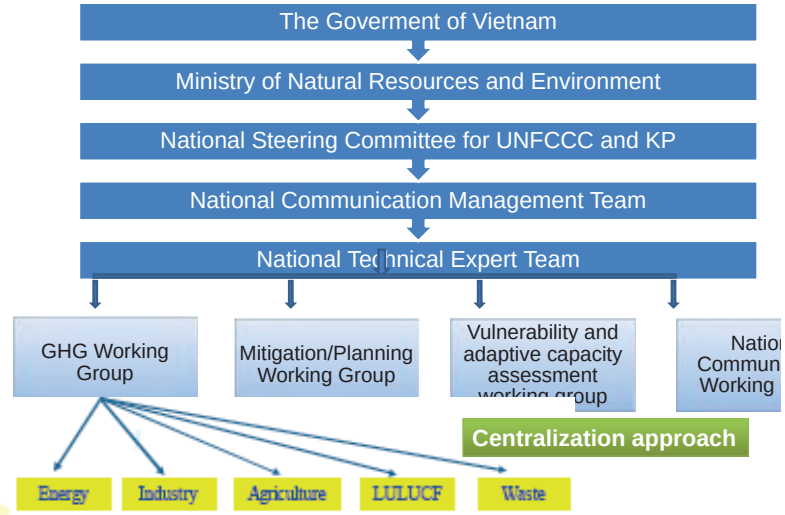
✓ **Plan of management of GHG emissions and carbon trading activities to the world market (2012)**

Carrying out the targets of GHG emission reduction and GHG absorption increase by 2020 (base year: 2005)
- ✓ *Energy: 8% (incl. transportation)*
- ✓ *Agriculture: 20%*
- ✓ *LULUCF: 20%*
- ✓ *Waste: 5%*

✓ **National Green Growth Strategy (2012)**

Reduce GHG emission (2011-2020)
- ✓ Reduce intensity of GHG emissions by 8-10%
- ✓ Reduce energy consumption per unit of GDP by 1-1.5% per year
- ✓ Reduce GHG emissions from energy activities by 10-20%

Current update

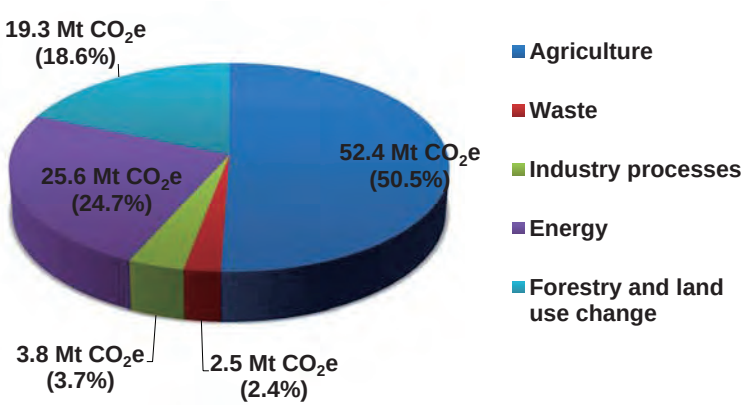


Current update (cont')

- ✓ Activity data (GSO, LMs and)
- ✓ Tiers (most IPCC default, REDD+ and other forest growth study of FSIV)
- ✓ 1994, 2000, 2005, 2010 (1994 for INC, 2000 for SNC and 2010 maybe for BUR1)

Current update (cont')

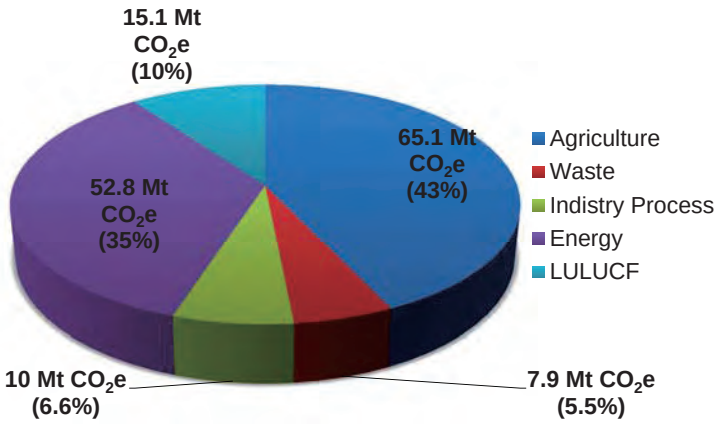
GHGI 1994



(Source: INC 2000)

Current update (cont')

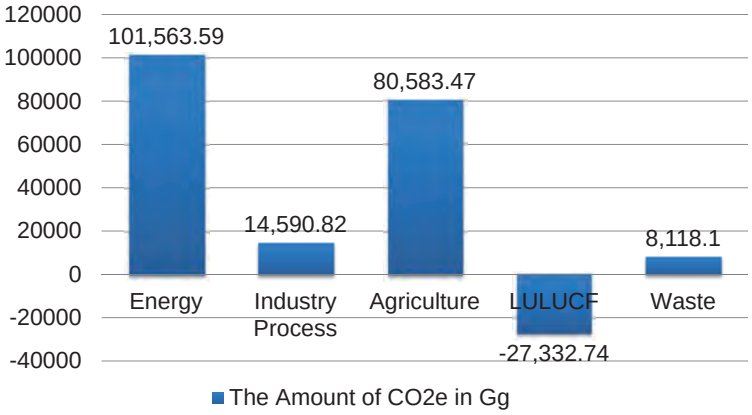
GHGI 2000



(Source: SNC 2010)

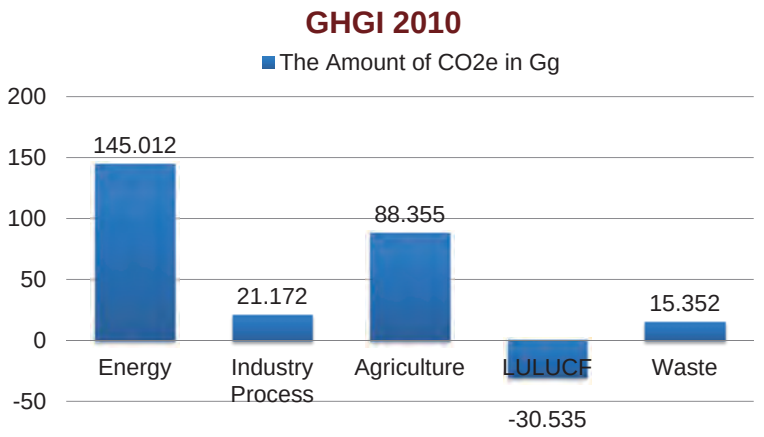
Current update (cont')

GHGI 2005



(Source: NIR 2005)

Current update (cont')



(Source: Draft NIR 2010)

Current update (cont')

- ✓ **Coordination amongst LMs,**
- ✓ **GHG Inventory system to be developed,**
- ✓ **Capacity building,**

GHG inventory national staffs and related agencies are trained , on-site coach by experts of GEF, JICA, SEA project, LEAP,…

GHGI constraints

- ✓ **A database supporting the inventory is not yet available as database; Inadequate information and data for GHG inventory in terms of reliability, comparability, completeness, consistency;**
- ✓ **Research, assessment and verification for certain country-specific emission factors remains incomplete;**
- ✓ **There is an inadequate pool of greenhouse gas inventory technical experts in the ministries and agencies. Inter-agency coordination remains limited.**

GHGI constraints (cont')

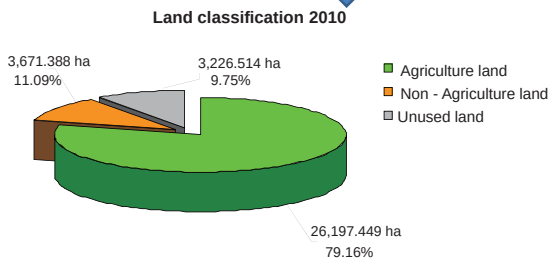
- ✓ **Incomplete data collection system for GHG inventory – no legal basis yet => focal agency responsible for the national inventory's data collection, analysis, verification and update has not been established or designated;**
- ✓ **The technical capacity to apply models**

GHGI Constraint (cont') – Example in land classification

- A. Forest land
- B. Cropland
- C. Grassland
- D. Wetland
- E. Settlements
- F. Other land

IPCC Guideline

National land classification



Source: MONRE, 2011

GHGI Constraints (cont't)– Example in forest inventory

Cycle I 90-95	Cycle II 96-00	Cycle III 01-05	Cycle IV 06-10	Cycle V 11-16

National Forest Resource Inventory, Assessment and Monitoring

Providing forest stand information such as:

- ✓ ***Area,***
- ✓ ***Forest type (species and age for plantation),***
- ✓ ***Timber volume, density of bamboo,***
- ✓ ***Forest owner,***
- ✓ ***Map of forest types, map of forest owners.***

Necessary supports

- ✓ **Strengthen institutional and technical capacities for national GHGI by Gov-funded programs, SEA Project, REDD+ Projects, SilvaCarbon Project, etc; Further training on mitigation analyzing and modeling, data archiving,**
- ✓ **Strengthen roles and responsibilities of sectors on GHG inventory/GHGI system**
- ✓ **Strengthen the cooperation/coordination for data collection;**
- ✓ **Development of activity data as database sources for national GHGI and countryspecific emission factors.**
- ✓ **Developing mapping system**

THANK YOU FOR YOUR ATTENTION

Nguyen Trong Hung
Department of Meteorology, Hydrology and Climate Change
Ministry of Natural Resources and Environment
Tel: 84-4-37759384/37759385;
Email: tronghung@ntprcc.gov.vn

CLIMATE CHANGE INTERNATIONAL TECHNICAL AND TRAINING CENTER (CITC)

Views from International Experts 'Capacity Development on GHG Inventory Development in Southeast Asia: Role and Prospect'

Bangkok, 7 August 2014

Dr. Retno Gumilang Dewi

INSTITUT TEKNOLOGI BANDUNG

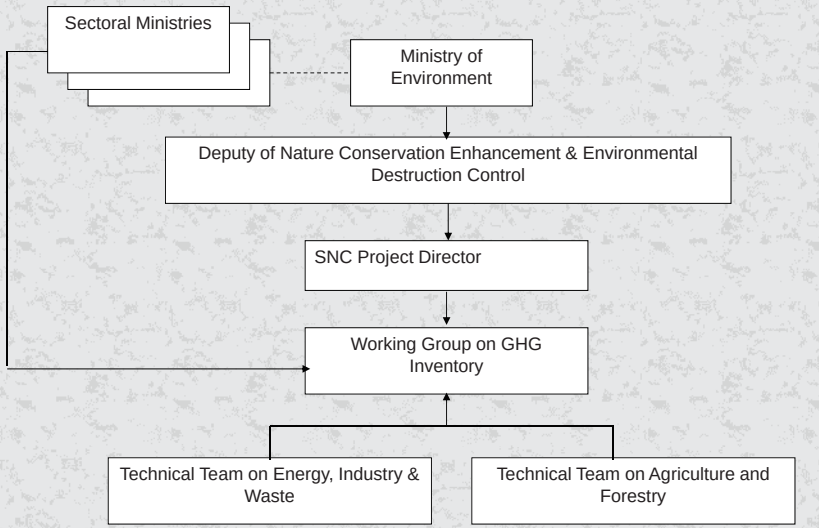
INTRODUCTION

- Most ASEAN countries have submitted at least two NC to UNFCCC (INC [IDN, 1999] and SNC [IDN, 2010]). They are also preparing their 1st BUR.
- Two UNDP/GEF EA projects have significant contribution in building capacity in the country in preparing these NCs.
- After experiencing two NATCOM documents preparation, Indonesian government officials and GHG experts began to become familiar with the process of preparing national communication.
- However, there are still needs for capacity building for strengthening/improving institutional arrangement and human resources.
  - government officials, where their role and involvement are becoming important in developing GHG inventory and other Natcom documents
  - experts that have been involved in previous NATCOMs need up dated information regarding recent development of GHG related issues, i.e. methodologies, procedures, reporting systems, institutional arrangements, MRV system, and others.

INSTITUTIONAL ARRANGEMENT OF INDONESIA INC/SNC

- Most INC and SNC was developed by a National Working Group (WG) on base project base (ad-hoc) supported by UNDP although the WG activity was coordinated by MoE.
- In Indonesia, WG is representative of relevant Ministries/Government Agency/Institutions/Council: Ministry of Environment (MoE), Ministry of Energy and Mineral Resources (MEMR), Ministry of Transportation (MoT), Ministry of Forestry, Ministry of Agriculture, Ministry of Public Works, Ministry of Industry (MoI), Ministry of Finance, Ministry of Agriculture and Forestry, BAPPENAS (National Development Planning Agency), BPPT (Technology Assessment and Application Agency), and DNPI (National Climate Change Council).
- Each of WG is assisted by experts and technical teams from universities and research agencies

Institutional Arrangement for INC and SNC …



Structure of the institutional arrangements for data collection, QA/QC, Archiving

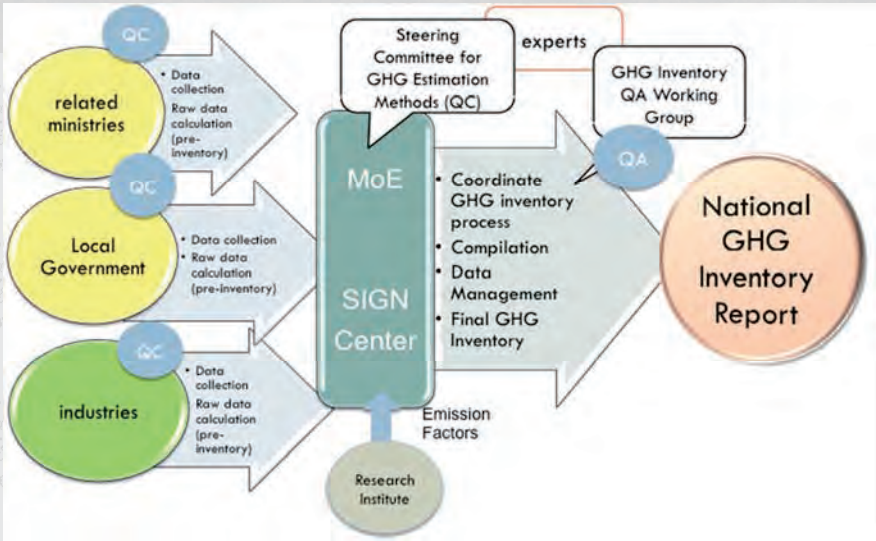
STAGES IN DEVELOPING THE NGHGI (INC / SNC)

- **Kickoff** : WG and inventory experts discussed methodologies and good practices for NGHGI, activity data, emission factors.
- **Developing NGHGI**: Data analysis, GHG estimations, and stake holder consultation for activity data, emission factor, and estimations results.
- **Sectoral Consultation**: completed NGHGI was discussed under the WG for the improvement of activity data consistency, emissions/removal factors, GHGs estimation. The external experts from different sectors are also included in determing the level of uncertainty activity data and emission factors.
- **Reporting and External Reviwing**: International experts through the UNDP Country Office are selected to review the draft final report and all spreadsheets calculations. Inputs and comments from the external reviewers are included in the improvement of the report.
- **Revision and Publication**: The revised final report is reported to the relevant ministries for final improvement and approval.

Methodology in Developing NGHGI in Indonesia

- Methodology used in SNC is 2006 IPCC GL in NGHG Inventory.
- The adoption of this methodology was not in line with GL for Natcom of non-Annex I Parties of the UNFCCC, adopted in decision 17/CP.8 where the UNFCCC GL states that non-Annex 1 countries have to use revised 1996 IPCC GL for developing their inventory.
- At earlier stage, WG members and experts decided to adopt 2006 IPCC GL using Tier 1 and, to some extent, some sectors adopted Tier 2 (use local emissions/ removal factors).
- Main reason of using 2006 IPCC GL is Prodoc of the SNC TOR from UNDP (main sponsor of Indonesian SNC development), which stated that revised 1996 IPCC Inventory GL will be adopted in developing GHG inventory for the SNC. However, if IPCC 2006 GL is available, the NGHG Inventory Team were encouraged to assess the use of 2006 IPCC GL.
- Based on consensus among sectors through a series of roundtable discussions, the 2006 IPCC GL was adopted for most sectors as it covers some sources which are not included in the revised 1996 IPCC GL.

NEW INSTITUTIONAL ARRANGEMENT



The Needs for capacity development .....

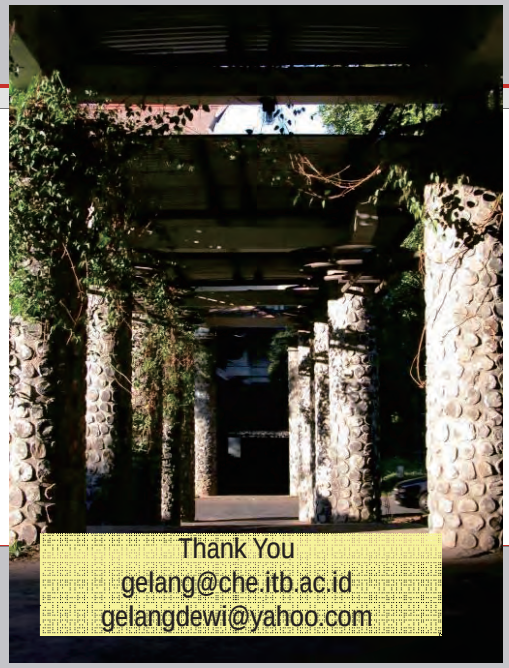
- Limited number of human resources involved in the process of the preparation of NC. Government official staffs who responsible for the NC preparation document frequently changes
- Capacity of practically some units of ministries/relevant institutions responsible for managing data relevant for developing GHG inventories and monitoring GHG mitigation actions is still limited.
- There are still rooms for improving the capacity of all institutions exists and the personnel as well as the institutions related to establishing a GHG inventory and mitigation actions demonstrated their eagerness and motivation for capacity building activities.
- Centers/Offices for managing National GHG Inventory System and MRV system are to be established for managing the GHG inventory and monitoring mitigation actions respectively.

- There are several issues that need to be addressed for next NC, i.e activity data, coverage of key sources (particularly to include product use in the IPPU sector), emission factors, methodology, improvement of accuracy (increase from TIER 1 to higher TIER), institutional arrangements, etc.
- Collecting data relevant for GHG inventories and monitoring of GHG mitigation actions involves many institutions/parties → close cooperation among institutions is required.
- Addressing these issues will require continuous support, i.e. capacity building, strengthening of institutions and cooperation among these institutions, establishment of integrated systems for GHG inventory and monitoring of the achievement of GHG mitigation actions, etc.
- BUR is new, particularly the scope that includes measurement, reporting and verification (MRV or QA/QC), needs and support received and the involvement of ICA in BUR → Capacity Building in these areas is definitely needed.

- Unlike previous NATCOM documents, the upcoming TNC (2016) will include the content of 1st BUR (2014) and 2nd BUR (2016).
- Most activities within the 1st BUR, 2nd BUR, and TNC will be the continuation and the upgrade of works that have done under SNC.
- The GHG inventory level for the first BUR, Second BUR, and TNC will be prepared according to the IPCC 2006 Guideline.
- Whenever possible, the GHG emission estimation will use higher TIER methodology (more detail activity data, country specific emission factor and/or parameter, etc.).

WHAT SHOULD BE ADDRESSED

1. The needs for capacity development on GHG inventory development in Southeast Asia
2. Types of capacity development needed for developing GHG Inventory at National and/or Sub-National
3. Needs of simple guidelines in local language and appropriate methods to deliver relevant material/information
4. Capacity development covers human resource capacity, institution capacity, and institutional arrangement
5. Continuous improvement



Challenges

- Daunting guidelines and software
  - Guidelines could be simplified
  - National data and AD
- Technology complications
- Additional requirement
  - MRV
  - ICA

www.frim.gov.my

Overcoming Challenges

- Step-wise approach
- Lesson learnt
  - Technology assessment
- Enhancing national capacity

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- Thank you

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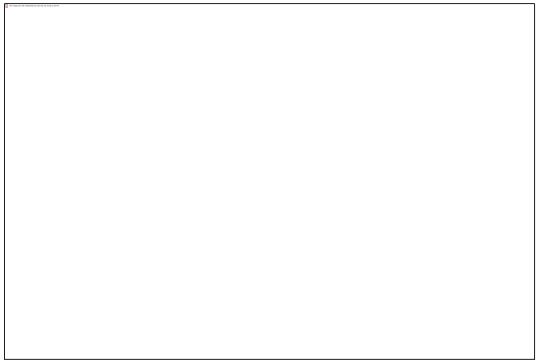
Capacity development on GHG inventory development in Southeast Asia: role and prospect

Dao Minh Trang
Climate Change Research Center
Institute of Meteorology, Hydrology and Climate Change
Vietnam

Bangkok, Thailand
4-7th August 2014

Overview of the Southeast Asia

- Consists of 11 countries squeezed between the Indian Ocean and the Pacific Ocean
- Generally divided into "mainland" (Myanmar, Thailand, Laos, Cambodia, and Vietnam) and "island" zones (Malaysia, Singapore, Indonesia, the Philippines, Brunei, and East Timor



Overview of the Southeast Asia

	Area *(Thous. km²)*	*Average population (mil peo)*	*Population density (People/km2)*
South East Asia	**4503.7**	**608.0**	**135**
Brunei	5.6	0.4	72
Cambodia	180.7	15.0	83
East Timor	14.5	1.1	76
Indonesia	1897.6	241.0	127
Laos	232.1	6.5	28
Malaysia	329.5	29.0	88
Myanmar	674.1	54.6	81
Philippines	299.7	96.2	321
Singapore	0.7	5.3	7751
Thailand	514.0	69.9	136
Vietnam	331.3	88.8	268

The status of Capacity development on GHG inventory development in Southeast Asia

- Although all Southeast Asia country is not obliged to reduce GHG emissions under regulations of KP in order to protect the climate system and obligations of the parties in UNFCCC and KP, all Southeast Asia country have performed a number of general obligations:
  - National Communication (NC) on Climate Change to the UNFCCC
  - National GHG inventory
  - Assessing climate change impacts for socio-economic areas,
  - Developing GHG mitigation measures, developing and taking adaptation measures to climate change adaptation
  - GHG emission reduction activities
- In order to perform National GHG inventory activity in Southeast Asia country, International organizations have helped a lot in capacity strengthening, technical Assistance, financial assistance, e.g. JICA, USAID, EPA, UNDP, UNFCCC, and non-governmental organizations

The status of Capacity development on GHG inventory development in Southeast Asia

- Capacity development on GHG inventory development in Southeast Asia shows in aspects as follows:
- Training: Southeast Asia countries are provided knowledge related to GHG gas inventories according to IPCC GL. The training courses also supports them to meet their reporting requirements under the UNFCCC including BUR.
- Technical: Southeast Asia countries receive technical support on the use of GHG gas inventories consists of accounting formula and tools. This training software has been successfully used in Southeast Asia (ALU software, Excel software in the calculation of greenhouse gas emissions,…)
- Methods: The National Inventory Reports in Southeast Asia countries have been compiled using methods which conform to the international guidelines, namely, the *Revised 1996 IPCC Guidelines* in estimating emissions and removals of GHGs. The method of tier 1, tier 2 applied to all categories Energy, Industrial Processes, Agriculture, LULUCF, Waste (detailed in the table below).
- Results of the GHG inventory: Southeast Asia countries used IPCC default (Tier 1,2) emission factors, country-specific emission factors and softwares to estimate GHG emissions for all source categories and then take results of the GHG inventory into NCs for submission to the UNFCCC.

The status of Capacity development on GHG inventory development in Southeast Asia

No	Country	Status of national GHG inventory
4	**Malaysia**	Malaysia submitted its NC2 to the UNFCCC in April 2011 and anticipates starting work on its BUR and NC3. The NC2 used IPCC default (Tier 1) emission factors to estimate GHG emissions for all source categories. Many industries, especially oil and natural gas production, have emphasized the need for development of country-specific emission factors based on the GHG accounting methods adopted by the industry.
5	**Philippines**	The Philippines is currently conducting an internal review of the NC2 and is beginning to develop its BUR and NC3. The NC1 was developed by an eight-person in-house team, while contracted consultants developed the NC2. The NC2 included emission estimates that primarily use IPCC default (Tier I) emission factors and in some cases use Tier 2 emission factors. Tier 2 emission factors were used for CH4 from rice cultivation, CH4 from solid waste disposal, CO2 removals from woody biomass, and CO2 emission from changes in land use and forests.
6	**Thailand**	Thailand submitted its NC2 to the UNCCCC in March 2011 and is beginning work on the NC3, which will focus on transitioning to the 2006 IPCC guidelines. Thailand's NC2 used some country-specific emission factors such as for N2O emissions from animal waste management, GHG emissions from rice cultivation, forest management, and waste management.
7	**Vietnam**	Vietnam submitted its NC2 to the UNFCCC in March 2010 and anticipates starting work on its NC3 and BUR. Vietnam is finalizing the national GHG inventory for 2005 and 2010, applying the Revised 1996 with reference from GPG 2000 except for LULUCF of which calculation is in accordance with GPG LULUCF 2003.

Prospects of GHG inventory projects in future

- Continue to support Southeast Asia countries in developing their GHG Inventories by capacity building, technical assistance and financial assistance;
- Southeast Asia countries will create favorable conditions for international organizations in supporting of GHG inventory for submission to the UNFCCC (2 years and NCs);
- Improve national methodologies, activity data and emission factors through a combination of hands-on training designed to meet the individual needs of the countries;
- Country-specific emission factors will be commonly used to estimate GHG emissions for all source categories for more accurate results in each country in Southeast Asia;
- Continue to use of GHG inventory management tools and methodologies specifically designed for the Agriculture, Forest and LU sectors;
- Through the assistance of GHG inventory, foreign organizations will be looking for opportunities in many other fields such as economic cooperation, social cooperation, relations, ...;

Thank you!!!

Bangkok, Thailand
4-7th August 2014

Capacity development on GHG inventory development in Southeast Asia: role and prospect;

Sector Based GHG Inventory for Central Government Organizations in Thailand

Wongkot Wongsapai

Assistant Professor
Faculty of Engineering, Chiang Mai University, Thailand
Email: wongkot@eng.cmu.ac.th

Workshop on Capacity Development Role for GHG Inventory Preparation in ASEAN countries:
How can trainings facilitate to breakthrough the barriers on GHG inventory preparation?
7th August 2014, Bangkok, Thailand

GHG Inventory Thailand

- *INC 1994*
- *SNC 2000*

Obstacle in the past:

- *Lack of expert during the INC and SNC*
- *The availability of (some) in-depth data is limited*
- *The (very) long continuity of GHG inventory report in INC and SNC*

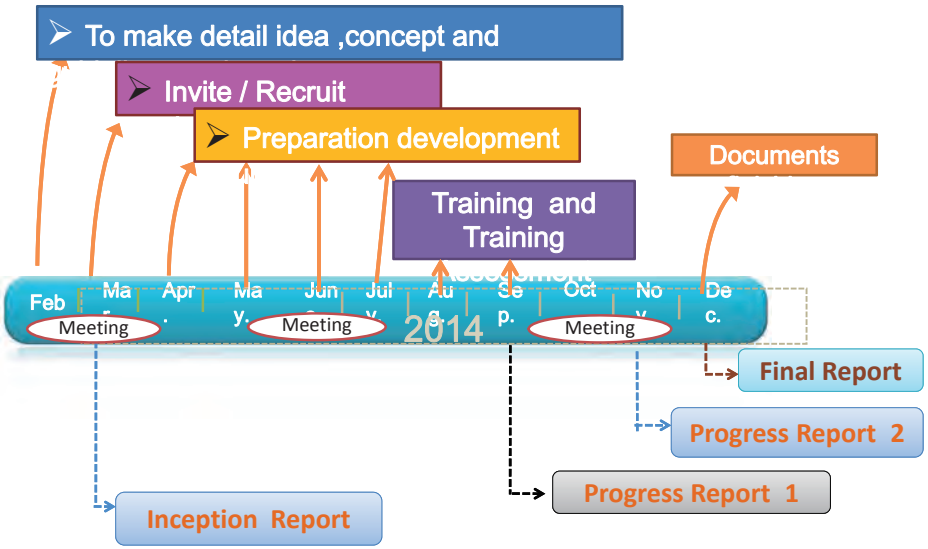
→ *Responsible persons from related central government organizations were not directly assigned*

→ *Direct responsible organization for GHG Inventory (institutional framework) not established*

Objectives

- ***To develop the curriculum,*** *in Sectoral based GHG inventory for central government organizations training course,*
- ***To develop and implement the Training for the trainer course,*** *to related central government organizations,*
- ***To develop the teaching materials,*** *which include instruction manual, training document, slide handouts and other related tools all are in Thai language.*
- ***To implement the training courses*** *for central government organizations.*

Project Plan



Working concept

GHG Inventory: First Phase (TGO and CMU)

Working group assigned
- Training needs assessment
- Develop the document concept
- Document common template

Nine experts from various universities

Develop the draft training documents
- Introduction + 5 sectors
- Training for the trainer

1st Peer review

Eleven peer reviewers from universities/agencies

Arrange the training courses

Comments received

2nd Peer review

Final edition and submit

GHG Inventory training document (Thai edition)

Dec 2014

Translation (CITC)

Translate training document in English

Document Dissemination

Dec 2014

Second Phase (CITC)

Develop other ASEAN countries GHG Inventory version

2015/16

Component Courses

Based on the Revised 1996 IPCC Guidelines (From country approach) But also have 2006 IPCC during the class

Comp 1 : Basic concept of GHG inventory
Comp 2 : GHG emission sources and data collection approaches (each sector)
Comp 3 : GHG accounting methodology
Comp 4 : GHG quality management and reporting
Comp 5 : GHG inventory applications

Trainings Document and Instructor's Manual

1. Basic Knowledge
2. Energy
3. Industrial process and solvent
4. Agriculture
5. Land use Change and Forestry
6. Waste

About the Training documents

Introduction

Energy

Industrial Processes, Solvent and Other Product Use

Agriculture

LUCF

Waste

Training document set (each sector)

(i) Textbook (in Thai)
- Instructor manual
- Student manual

(ii) Slide handouts
(iii) Training for the trainer document
(iv) Other related media

Training schedule

Sectoral Based GHG Inventory Courses

Course 1

Training 1 : Training to test course at least 20 attendants (13 – 15 August 2014)

Training 3 : Training to publish course at least 30 attendants (3 – 5 September 2014)

Course 2

Training 2 : Training to Trainer (TTT) at least 10 attendants (18 – 19 August 2014)

Conclusions

- *Develop the curriculum for support the related public organizations in GHG's activity data system*
  → Covering all related central gov. organizations
- *Focus in all GHG inventory sectors, based on revised 1996 IPCC edition → Based on Thai demand*
- *All training document (handbooks, slide, media) are developed by Thai expert working group and also have peer review committee consideration*
  → Comments is strongly required
- *Prepare for the future by develop the training for the trainers for related central organization staff*
  → Network established in the long run
- *Future step from CITC: Other ASEAN country's version in GHG inventory training documents*

Thank you

Workshop on Capacity Development Role for GHG Inventory Preparation in ASEAN countries:
How can trainings facilitate to breakthrough the barriers on GHG inventory preparation?

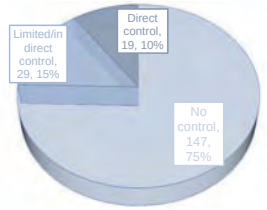
Views from international experts:
Capacity development on GHG inventory development in Southeast Asia:
role and prospect

7th August 2014 in Bangkok, Thailand

Dr. Mariko Fujimori
JICA Expert Team

Key issue:
How to develop and use GHG inventory at local level effectively;
= How to use the inventory for practical mitigation activities and projects.

- The items under direct control of local government for the development of national GHG inventory is limited.
- However, local level GHG inventory should be developed and used to implement practical mitigation measures both at local level and national level.



Example: IPCC 2006 GL

What kind of issues/difficulties do we encounter?

What kind of inventory will be most useful and effective for the purpose?

[Example of possible options: Desirable steps to encourage citizens' action to reduce GHG emission from household electricity consumption - one of the emerging sources]

- Current condition of household/per capita electricity consumption and GHG emission, **--> by inventory**
- Possible countermeasures, its effect to reduce energy cost and GHG emission,
- Potential incentives including financial support scheme to implement such measures,

How can we encourage citizens to save electricity and reduce emission effectively using the inventory?

- Describe the current condition of electricity consumption **by appropriate inventory**,
- Analyze possible reasons of the increase (e.g., increase of population, electric appliances, temperature, etc.),
- Propose list of applicable countermeasures with quantitative GHG emission reduction as well as cost reduction effect and/or financial support scheme.

CITC can provide:

- **Capacity development training to provide useful inventory,**
- **Information of possible countermeasures,**

Through its training courses and knowledge dissemination,

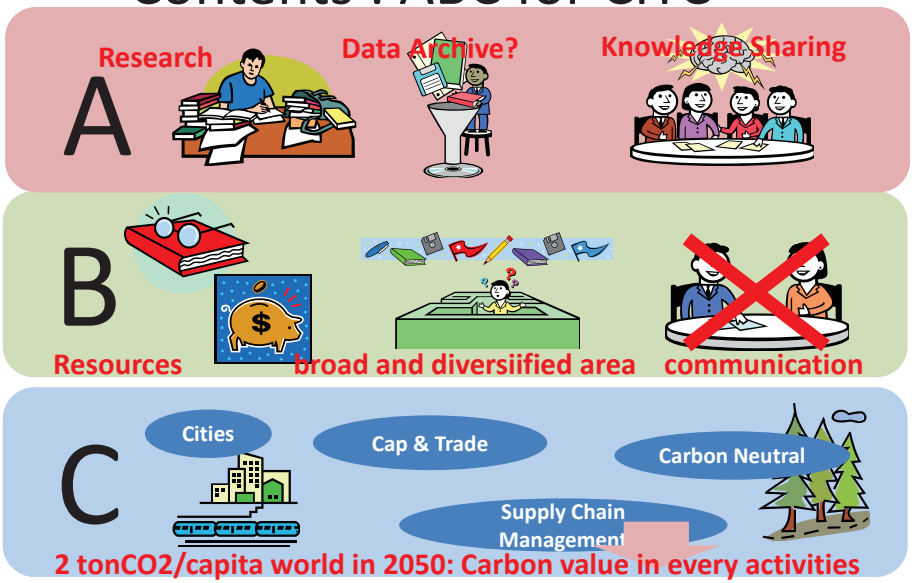
To promote appropriate and practical countermeasures at local level. (of course, at national level, as well!)

How CITC can be a breakthrough of GHG Inventory barriers?

Workshop on Capacity Development on Greenhouse Gas Inventory in the Southeast Asia Region
August 2014, Bangkok

Shuzo Nishioka
Secretary General, LoCARNet
Institute for Global Environmental Strategies (IGES)

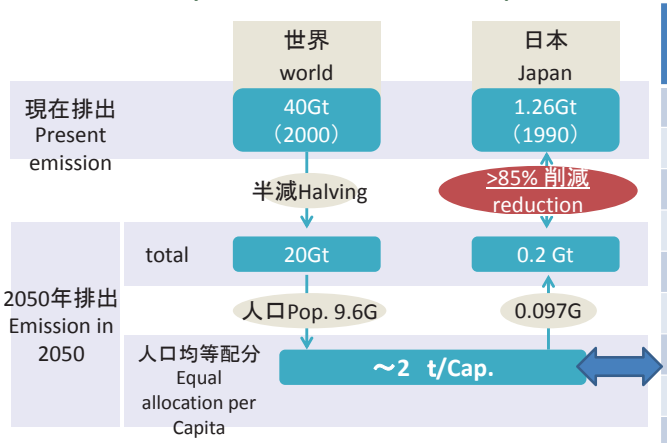
Contents : ABC for CITC



Challenge, Barrier and Action

- Challenge
  - Our common goal: transition to Low Carbon World
    - 2 tonCO_2/Capita in 2050, finally carbon neutral world end of this century
    - low carbon economy, Low carbon society, low carbon behavior
  - GHG inventory work, which is newly identifying basic value of all the human activities in low carbon society, need to be more deepened and penetrated into:
    - National LC development policy (planning and implementation)
    - Low carbon city planning and implementation
    - absorption field such as REDD and land-use change
    - Supply chain management
    - MRV in PDCA cycle in all activities above
    - Low Carbon policy: Carbon tax, Cap &Trade, Carbon offset, Carbon footprint, NAMA, MRV,,

2050 halving from now: 2tonCO_2/Capita World
Japan: more than 80% reduction（base year 1990）
Asia: already more than 2ton/ Capita



2010年	Per capita CO2 (tCO2/人)
USA	17.4
China	5.55
India	1.35
Indonesia	1.63
Thailand	3.25
France	5.34
Germany	8.92
UK	7.92
Japan	9.05

※世界の人口は国連「World Population Prospects, the 2012 Revision」より、日本の人口は社人研「日本の将来推計人口（平成24年1月推計）」より

Challenge, barriers and solutions

- **Challenge**
- **Barriers**
  - **Diversity** among countries in the region: natural environment, developing stage economic & industrial structure, living style, ,,,
    - Ex. Methane emission from paddy field
  - Diversity among areas of application: national level, local level, sectors, ,,
    - Ex. National GHG Inventory vs. Ichikawa City
    - Ex. Tokyo Metropolis: C&T among big buildings: survey, voluntary plan, C&T
    - Ex. Carbon Offset: big difference among industry and business

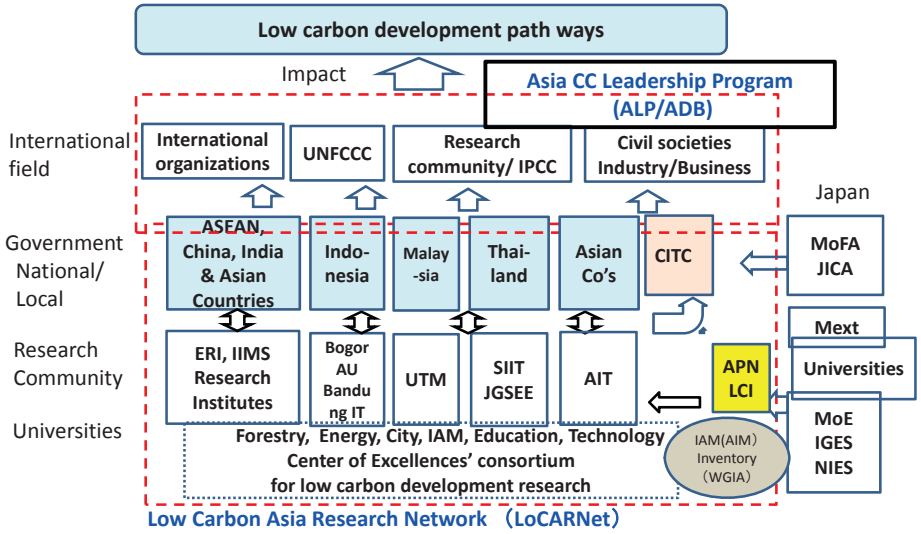
  ⇒How to accumulate diversified knowledge into common asset?

  - Urgent necessity of scientific data and survey > human and financial resources

Challenge, barriers and solutions

- **Challenge**
- **Barriers**
- **Action for solution**
  - Bases: Ownership in knowledge acquisition (foster research community fit to local condition)
  - Accumulation : GHG Inventory data archive and distribution center?: New authorized GHG inventory association for QA/QC, apart from UNFCCC international negotiation?
  - Forum for knowledge sharing, mutual inquiry/learning, south-south corporation
  - Networking of diversified (locally & disciplinarily) and autonomously working entities (CoE Alliance?, City GHG network, WGIA, industrial sector-wise standard: internet type?)

Asia is almost establishing effective low carbon knowledge sharing mechanism, in which CITC plays the key role in knowledge sharing for low carbon Asia.



Networking of Low Carbon Asia Knowledge Sharing community