CAPACITY DEVELOPMENT FOR NATIONAL GHG INVENTORY AND JAPAN'S SUPPORT

CAPACITY BUILDING FOR GREENHOUSE GAS INVENTORY IN VIETNAM

Department of Meteorology Hydrology and Climate Change
Ministry of Natural resources and Environment of Vietnam

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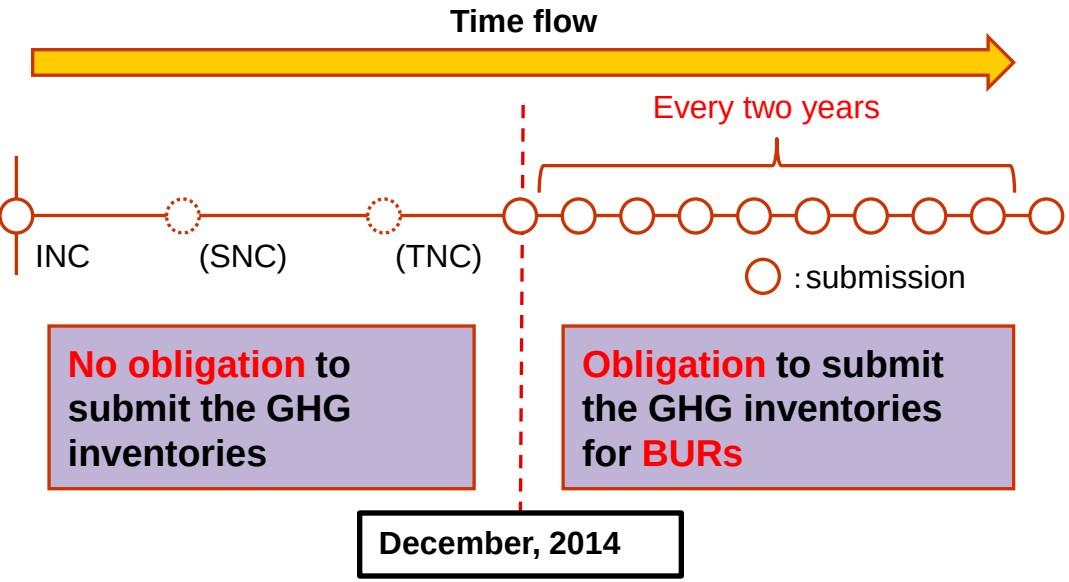
Viet Nam

- ✓ Population in 2011: about 87 million
- ✓ GDP growth in 2011: 5.89%
- ✓ Climate: monsoon tropical
- ✓ Annual mean temperature: 12.8-27.7° C
- ✓ Average annual rainfall: 1,400-2,400mm
- ✓ GHG emission in 2000: 151 Tg CO_2 e

Background

- GHG inventories are prepared to :
- understand GHG emission trends
- provide a basis for developing an action plan to mitigate GHG emissions
- track progress of mitigation policies/actions
- set goals and targets for future reductions



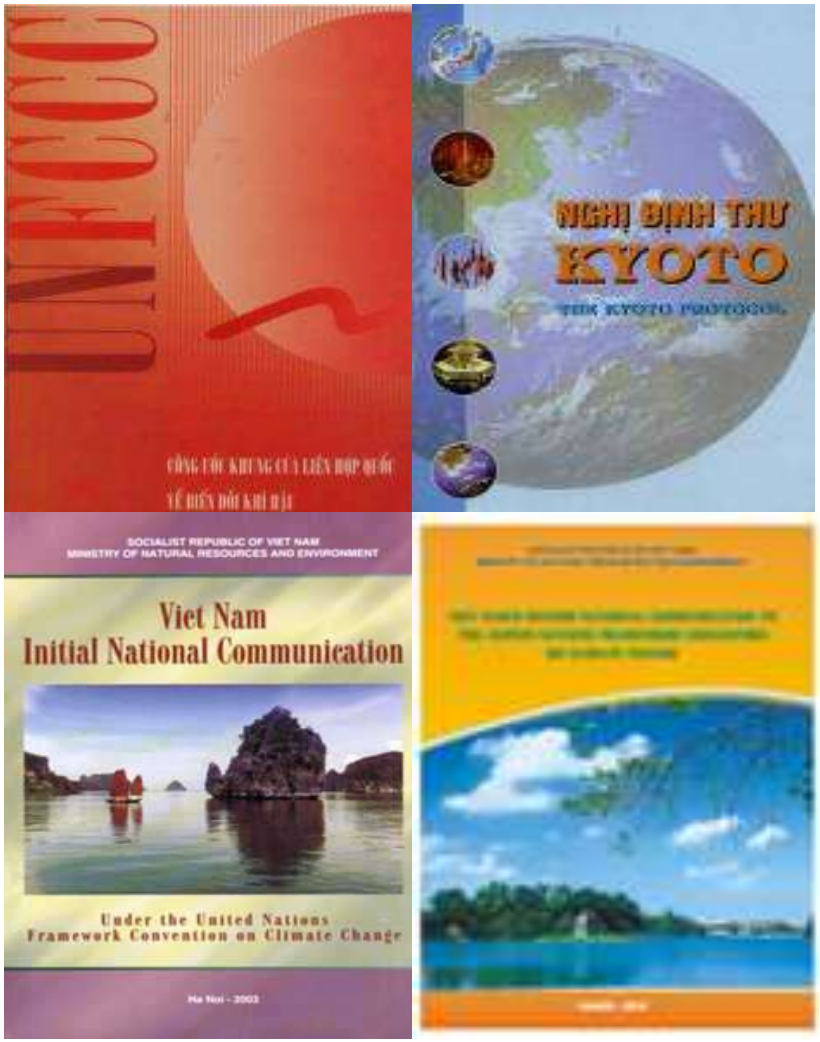
●Developing countries will have a commitment to submit NCs and BURs. (Both include GHG inventories.)

● COP 16 and COP 17: The frequency of the submission of NCs and BURs are determined.

- **◆NCs: Every four years**
- **◆BURs: Every two years**

Background

- Past activities
  - Vietnam has signed UNFCCC in 1992, and ratified in1994.
  - Vietnam submitted two National Communications to UNFCCC.
    - Initial National Communication (INC) submitted in 2003
    - Second National Communication (SNC) submitted in 2010
  - Vietnam is preparing the 1st Biennial Update Report (BUR)
- Challenges for the next step
  - For preparation of BURs, GHG inventory preparation should be on continuous basis.
  - The following areas need to be strengthened:
    - Arrangement for the National system
    - Capacity building of human resources



The national inventory results from INC and SNC

Table 2.19. GHG emissions by sector, in 1994 and 2000

Unit: thousand tonnes of CO_2e

Year	1994		2000	
Sector	Emissions	Percentage	Emissions	Percentage
Energy	25,637.09	24.7	52,773.46	35.0
Industrial processes	3,807.19	3.7	10,005.72	6.6
Agriculture	52,450.00	50.5	65,090.65	43.1
LULUCF	19,380.00	18.6	15,104.72	10.0
Waste	2,565.02	2.5	7,925.18	5.3
Total	**103,839.30**	**100**	**150,899.73**	**100**

Source: Viet Nam Initial National Communication, 2003

GHG emission projections

[Source: SNC]

Table 2.28. GHG emission projections for 2010, 2020 and 2030

Unit: million tonnes of CO_2e

Sector	2010	2020	2030
Energy	113.1	251.0	470.8
Agriculture	65.8	69.5	72.9
LULUCF	-9.7	-20.1	-27.9
Total	169.2	300.4	515.8

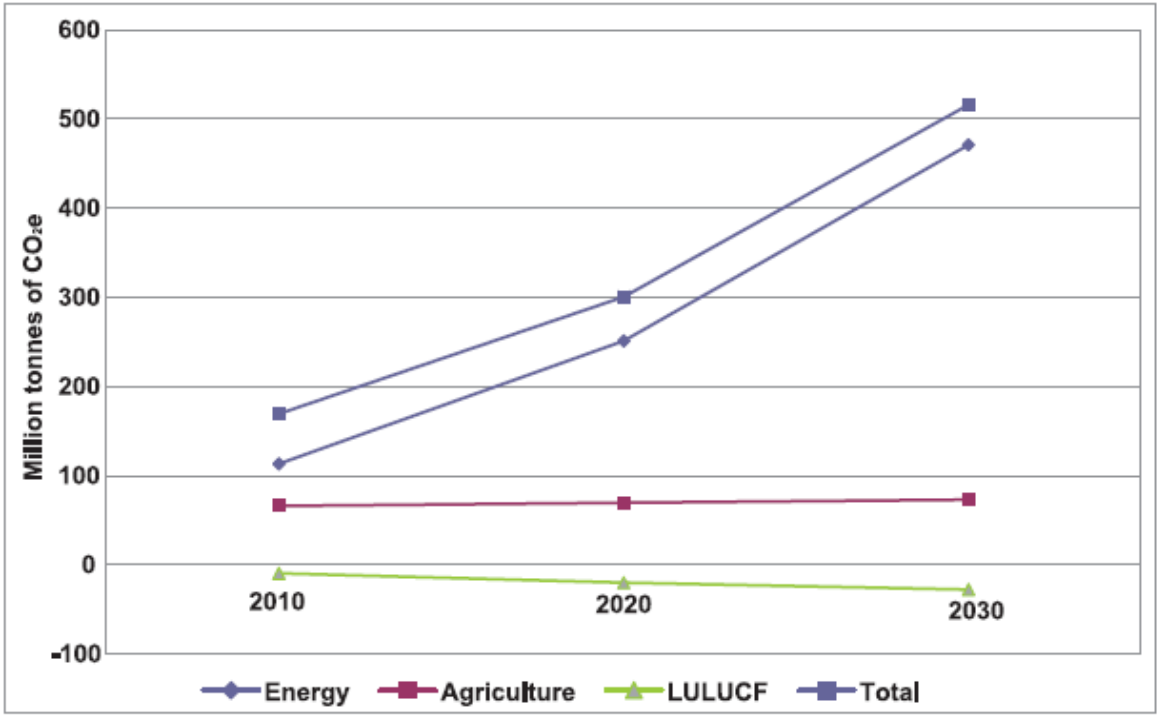


Figure 2.10. GHG emission projections 2010–2030

Overview of the Project

- **Name of project:** Capacity Building for National Greenhouse Gas Inventory in Vietnam
- **Donor:** Japan International Cooperation Agency (JICA)
- **Line agency:** Ministry of Natural Resources and Environment of Vietnam
- **Project owner:** Department of Meteorology, Hydrology and Climate Change (DMHCC)
- **Vietnam Counterparts:** Vietnam Environment Administration (VEA), Institute of Meteorology Hydrology and Environment (IMHEN), Institute of Strategy and Policy on Natural resources and Environment (ISPONRE)
- **Project duration:** 5/2011-5/2014
- **Total budget:** 3,462,966 USD
- **Type of ODA:** Grant ODA

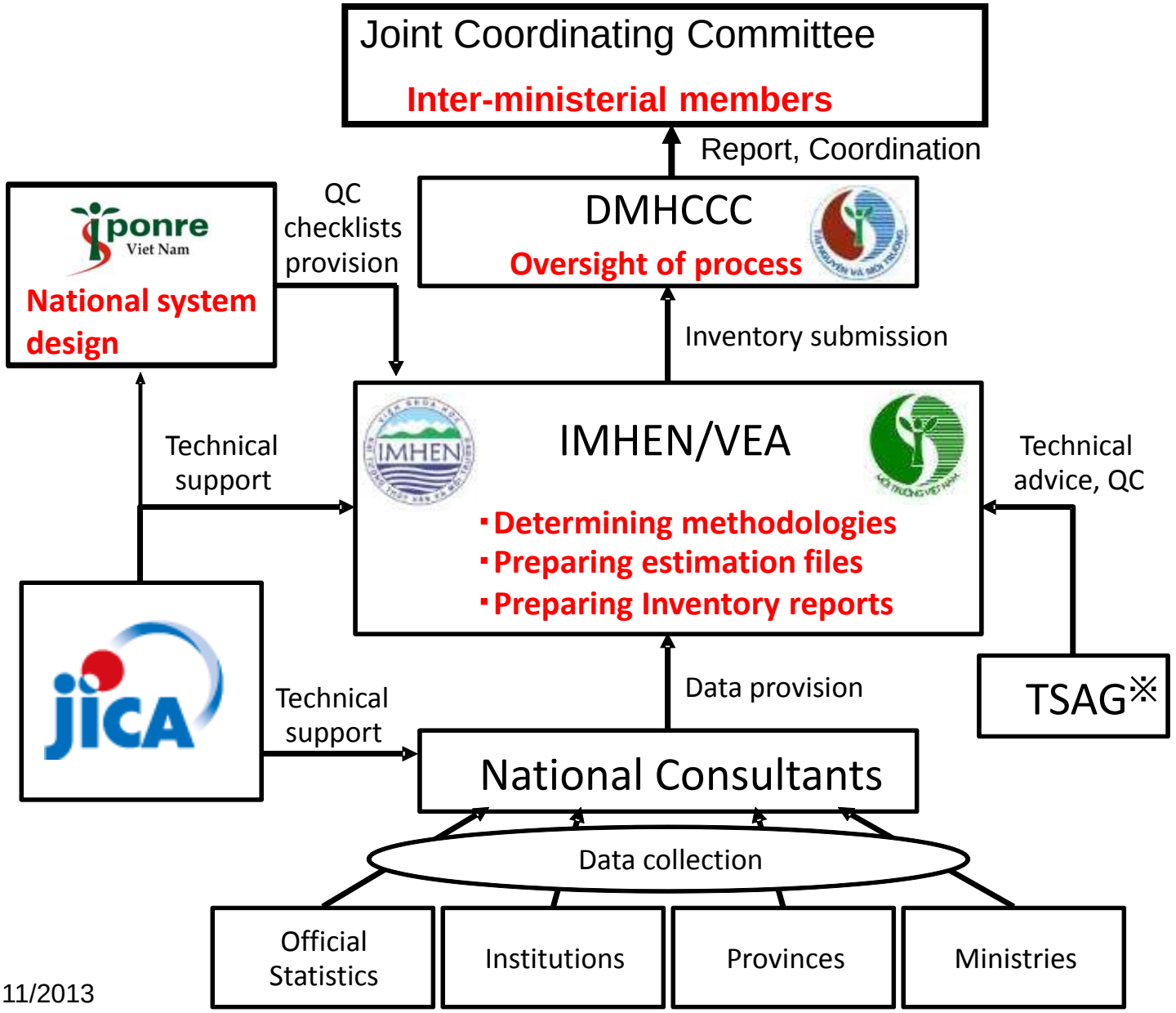
Overview of the Project

- **Goal:** promote mitigation actions in a measurable, reportable and verifiable manner through periodical preparation of national greenhouse gas (GHG) inventories with improved accuracy and reliability
- **Objective:** strengthen the capacity of Vietnam to periodically prepare GHG inventories based on prepare GHG inventories for 2005 and 2010
- 05 inventory categories: energy, industries, agriculture, waste, LULUCF
- **Expected outcomes:**
  - To improve the structure to systematize the task of compiling the National GHG Inventory
  - To promote the understanding of GHG inventory-related personnel; and
  - To improve the quality and management of inventory data from each sector

Implementation: key stakeholders

Vietnamese side	**Roles and responsibilities**
DMHCC	Oversight responsibility
ISPONRE	Design for the national system proposal
IMHEN, VEA	Emission estimation, quality control, preparation of the reports
Relevant Ministries and Agencies	Data and information provision
National Consultants	Data collection
Japanese side	
JICA	Technical, financial support

National Inventory System of year 2005



※ Trial Scientific Advisory Group

Implementation: Main outputs and activities

Develop the national system

- Assess the current capacity of the existing system for preparing national GHG inventories.
- Prepare a roadmap for improving the national system for GHG inventory preparation.
- Draft and improve a manual for institutional arrangement for preparing national GHG inventories.

Enhance the technical capacity to prepare GHG inventories

- Collect necessary data, organize the data into a database format, and prepare the national GHG inventory for 2005 and 2010.
- Conduct workshops on preparation and methodological study on accuracy and reliability of national GHG inventories.
- Draft an inventory report including the results, the methods/data used, and improvements.

Enhance the capacity to improve the GHG inventories

- Conduct workshops on the improvement of the GHG inventories.
- Analyze and identify categories which should be given priority in the improvement.
- Draft and improve a national GHG inventory improvement plan.

Current progress

- ☑ Assessment of Second National Communication (SNC) GHG inventory
- ☑ Analyzed and learned the IPCC methodologies
- ☑ Consideration of the future national system of GHG inventories in Vietnam

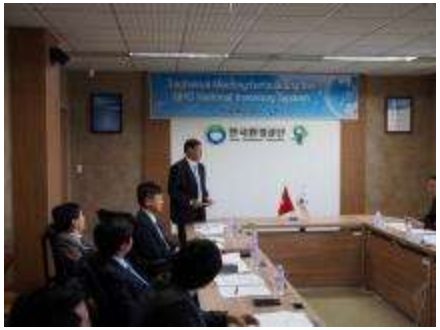
- Preparation of 2005 GHG inventory:
  - ☑ Collection of the necessary data
  - ☑ Development of estimation files and inventory report including an improvement plan for the 2010 GHG inventory

- Preparation of 2010 GHG inventory:
  - ☐ Preparation for the estimation files and inventory report including an improvement plan for the future

5/2012 — **7/2013** — **5/2014**

Other supporting activities

- Nov 2011 – Mar 2012: Technical seminars from JICA experts
- Periodical meeting with short term experts of Japanese consultant company (MURC)
- 21-28 Feb 2012: Study tour to Japan to exchange overview of building national system and collecting data
- 13-17 Oct 2013: Study tour to Korea to survey the national inventory system



National inventory report for 2005

- Inventory methods:
  - Revised 1996 Intergovernmental Panel on Climate Change (IPCC) Guidelines for National Greenhouse Gas Inventories
  - IPCC Good Practice Guidance and Uncertainty Management in National Greenhouse Gas Inventories
  - IPCC Good Practice Guidance for Land Use, Land-Use Change and Forestry
- Data:
  - National statistics data from Statistic Yearbooks
  - Data provided by government institutions

National inventory report for 2005

- In 2005, total GHG emissions in Vietnam were 155,101 Gg CO_2 equivalent with LULUCF and 204,856 Gg CO_2 equivalent without LULUCF.
- The main GHG in Vietnam was CO_2, accounting for 96,803 Gg CO_2 equivalent and 47.3 per cent of total GHG emissions (without LULUCF), followed by CH_4 (76,660 Gg CO_2, 37.4 per cent), and N_2O (31,393 Gg CO_2, 15.3 per cent).

	CO2	CH4	N2O	total
Energy	**82,204**	**19,090**	**270**	**101,564**
Industrial Processes	**14,591**	**0**	**0**	**14,591**
Agriculture	**0**	**51,155**	**29,428**	**80,583**
LULUCF	**-49,851**	**79**	**18**	**-49,755**
Waste	**8**	**6,415**	**1,695**	**8,118**
Total Emissions (without LULUCF)	**96,803**	**76,660**	**31,393**	**204,856**
Total Emissions (with LULUCF)	**46,952**	**76,739**	**31,411**	**155,101**

Key categories not including LULUCF

	category	gas	emissions	percentage	cumulative percentage
1	4.C.1. Irrigated	CH4	35,850.25	17.5%	17.5%
2	1.A.1.a. Public Electricity and Heat Production	CO2	23,960.12	11.7%	29.2%
3	1.A.2.f. Other	CO2	20,680.32	10.1%	39.3%
4	1.A.3.b. Road Transportation	CO2	17,718.48	8.6%	47.9%
5	4.D.1. Direct Soil Emissions	N2O	15,372.26	7.5%	55.4%
6	2.A.1. Cement Production	CO2	11,951.63	5.8%	61.3%
7	1.B.2.a. Oil	CH4	8,721.30	4.3%	65.5%
8	4.D.3. Indirect Emissions	N2O	8,538.57	4.2%	69.7%
9	1.A.4.b. Residential	CO2	5,727.28	2.8%	72.5%
10	4.A1. Cattle	CH4	5,165.58	2.5%	75.0%
11	1.B.2.c.i. Venting	CH4	4,605.38	2.2%	77.3%
12	4.B.8. Swine	CH4	4,032.95	2.0%	79.2%
13	1.A.4.a. Commercial/Institutional	CO2	3,997.41	2.0%	81.2%
14	1.B.1.a. Coal Mining and Handling	CH4	3,555.48	1.7%	82.9%
15	6.B2. Domestic and Commercial Waste Water	CH4	3,443.26	1.7%	84.6%
16	4.A.2. Buffalo	CH4	3,375.14	1.6%	86.3%
17	4.B.13. Solid Storage and Dry Lot	N2O	2,718.45	1.3%	87.6%
18	6.A. Solid Waste Disposal on Land	CH4	2,303.86	1.1%	88.7%
19	4.D.2. Pasture, Range and Paddock Manure	N2O	2,051.83	1.0%	89.7%
20	1.B.2.b. Natural Gas	CH4	1,800.73	0.9%	90.6%
21	1.A.3.d. Navigation	CO2	1,715.00	0.8%	91.4%
22	6.B2. Domestic and Commercial Waste Water	N2O	1,694.70	0.8%	92.3%
23	1.A.4.c. Agriculture/Forestry/Fisheries	CO2	1,625.75	0.8%	93.0%
24	4.F. Field Burning of Agricultural Residues	CH4	1,342.58	0.7%	93.7%
25	2.A.2. Lime Production	CO2	1,308.19	0.6%	94.3%
26	1.A.2.d. Pulp, Paper and Print	CO2	1,229.23	0.6%	94.9%
27	1.A.3.a. Civil Aviation	CO2	1,176.02	0.6%	95.5%

Five largest categories are in the energy and agriculture sectors. Sum of 5 sources account over half of total GHGs

- 27 categories were identified as key categories without LULUCF.
- They have a significant influence on the GHG inventory in terms of absolute level of emissions.
- These categories should be prioritized in the improvement of future GHG inventories.

Key categories including LULUCF

	category	gas	emissions	percentage	cumulative percentage
1	4.C.1. Irrigated	CH4	35,850.25	12.5%	12.5%
2	5.B.1. Cropland remaining Cropland	CO2	35,308.28	12.3%	24.8%
3	5.A.1. Forest Land remaining Forest Land	CO2	27,538.35	9.6%	34.4%
4	1.A.1.a. Public Electricity and Heat Production	CO2	23,960.12	8.3%	42.7%
5	1.A.2.f. Other	CO2	20,680.32	7.2%	49.9%
6	1.A.3.b. Road Transportation	CO2	17,718.48	6.2%	56.1%
7	4.D.1. Direct Soil Emissions	N2O	15,372.26	5.4%	61.4%
8	5.D.1. Wetlands remaining Wetlands	CO2	13,360.00	4.7%	66.1%
9	2.A.1. Cement Production	CO2	11,951.63	4.2%	70.2%
10	1.B.2.a. Oil	CH4	8,721.30	3.0%	73.3%
11	4.D.3. Indirect Emissions	N2O	8,538.57	3.0%	76.2%
12	1.A.4.b. Residential	CO2	5,727.28	2.0%	78.2%
13	4.A1. Cattle	CH4	5,165.58	1.8%	80.0%
14	1.B.2.c.i. Venting	CH4	4,605.38	1.6%	81.6%
15	4.B.8. Swine	CH4	4,032.95	1.4%	83.0%
16	1.A.4.a. Commercial/Institutional	CO2	3,997.41	1.4%	84.4%
17	1.B.1.a. Coal Mining and Handling	CH4	3,555.48	1.2%	85.7%
18	6.B2. Domestic and Commercial Waste Water	CH4	3,443.26	1.2%	86.9%
19	4.A.2. Buffalo	CH4	3,375.14	1.2%	88.0%
20	5.B.2. Land converted to Cropland	CO2	3,006.69	1.0%	89.1%
21	4.B.13. Solid Storage and Dry Lot	N2O	2,718.45	0.9%	90.0%
22	6.A. Solid Waste Disposal on Land	CH4	2,303.86	0.8%	90.8%
23	4.D.2. Pasture, Range and Paddock Manure	N2O	2,051.83	0.7%	91.6%
24	1.B.2.b. Natural Gas	CH4	1,800.73	0.6%	92.2%
25	1.A.3.d. Navigation	CO2	1,715.00	0.6%	92.8%
26	6.B2. Domestic and Commercial Waste Water	N2O	1,694.70	0.6%	93.4%
27	1.A.4.c. Agriculture/Forestry/Fisheries	CO2	1,625.75	0.6%	93.9%
28	5.E.2. Land converted to Settlements	CO2	1,451.45	0.5%	94.4%
29	4.F. Field Burning of Agricultural Residues	CH4	1,342.58	0.5%	94.9%
30	2.A.2. Lime Production	CO2	1,308.19	0.5%	95.4%
31	1.A.2.d. Pulp, Paper and Print	CO2	1,229.23	0.4%	95.8%
32	1.A.3.a. Civil Aviation	CO2	1,176.02	0.4%	96.2%

Rice cultivation is still the largest category.
Two categories in LULUCF are also identified as large key categories.

- 32 categories were identified as key categories with LULUCF.
- They have a significant influence on the GHG inventory in terms of absolute level of emissions.
- These categories should be prioritized in the improvement of future GHG inventories.

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Review

- **Advantages:**
  - Complete the **drafts** of:
    - Institutional arrangement relevant to the GHG inventory preparation
    - Roadmap for improving the national system
    - Data collection framework for estimating GHG Emission/Removals
    - Cross-cutting QA/QC activity plan
  - **Report of 2005 GHG inventory** including the improvement plan for the 2010 GHG inventory is complete
  - **Enhance relationships** with key ministries and agencies that are essential in preparing GHG inventories established
  - Vietnamese counterparts have a **good understanding of the methods** for estimating the GHG emission and requirements for preparing a GHG inventory

Review

- **Challenges**
  - **Time limited for the national inventory report for 2010**
  - **Data collection:** gaps in identifying the available data sources
  - **Institutional arrangements:** prepare a legal basis for institutional arrangements that support annual inventory and establish GHG inventory office as a national focal point
  - Quality assurance/ Quality control **(QA/QC):**
    - Get more support from General Statistic Office
    - QA/QC plan in detail
    - Propagate Guidebook for QA/QC

Plan for the next inventory cycle

- ISPONRE and JICA project office will review the recommended National Inventory System by taking lessons from 2005 and 2010 inventory compilation into account.
- DMHCC and the project will seek further cooperation with relevant ministries.
  - Discussion on methodology
  - Data collection
  - QC check
- DMHCC is preparing to submit legal document to the Government to propose establishing the system based on findings from the project.

Conclusion

- **Capacity building** for institutional arrangement and inventory staffs to conduct inventory periodically
- Forming a **legal basis** for national inventory (Decision approved by the Prime Minister)
- Create favorable environment for **cooperation** among related Ministries and agencies
- **Positive supports** for the first Biennial Update Report and next National Communication

THANK YOU!

For further information please contact:

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