

**Questionnaire for “GHG Mitigation and Low Carbon Society”**

1. Please summarize current status of climate change mitigation in your country.
  - a. National policy and Plan
  - b. Measures

**National Strategy on Climate Change B.E. 2551- 2555 (2008 - 2012)**

The Ministry of Natural Resources and Environment (MNRE), as the national focal point of the United Nations Framework Convention on Climate Change and a focal point for climate change implementation in Thailand, has therefore formulated and launched Thailand’s Strategic Plan on Climate Change B.E. 2551-2555 (2008-2012), aiming for it to be the country’s first comprehensive response to climate change, to remove existing barriers to climate change implementation in Thailand, and to promote an integrated approach of problem-solving by relevant agencies in various sectors.

There are six strategies in Thailand’s Strategic Plan on Climate Change B.E. 2551-2555 (2008-2012).

<b>STRATEGY 1: Build capacity to adapt and reduce vulnerabilities to climate change impacts</b>
<p><b>Goal:</b> Protect, conserve and add values to natural resource base, and protect, conserve and improve environmental quality and the quality of living from climate change impacts.</p> <p><b>Guidelines:</b></p> <ol style="list-style-type: none"> <li>1.1) Build capacity to assess climate change impacts</li> <li>1.2) Prevent and mitigate damage caused by climate change impacts on the following sectors:                             <ul style="list-style-type: none"> <li>– natural resources, ecological systems, biological diversity</li> <li>– natural disaster and human settlements</li> <li>– agriculture, industry, cultural and historic sites</li> <li>– public health</li> </ul> </li> <li>1.3) Build capacity to adapt to climate change in the above sectors.</li> </ol>

- Examples of measures:**
- Identify hot spots vulnerable to climate change impacts
  - Promote activities such as water and forest conservation and restoration, infrastructure improvement and land use change to reduce vulnerabilities in hot spot areas
  - Assess adaptation options for hot spot areas including changing crop types, farming processes, etc.
  - Establish effective early warning systems and evacuation plans to minimize damage from extreme climate events

**STRATEGY 2: Promote greenhouse gas mitigation activities based on sustainable development**

**Goal:** Reduce greenhouse gas emission and promote clean technologies

- Guidelines:**
- 2.1) Promote greenhouse gas mitigation in the energy sector through improving energy efficiency, promoting renewable energy
  - 2.2) Promote greenhouse gas mitigation in the waste sector
  - 2.3) Promote greenhouse gas mitigation in the industrial sector
  - 2.4) Promote greenhouse gas mitigation in the agricultural sector
  - 2.5) Increase carbon sinks
  - 2.6) Develop and promote mechanisms that support clean technology development

- Examples of measures:**
- Promote use of renewable energy in power generation, transportation and industrial processes
  - Improve energy efficiency in transportation, industrial processes, commercial and residential buildings
  - Promote forest conservation, afforestation and reforestation to increase carbon sinks
  - Increase urban green space

**STRATEGY 3: Support research and development to better understand climate change, its impacts and adaptation and mitigation options**

**Goal:** Support R&D and climate change knowledge management and develop climate change knowledge base to support decision-making

- Guidelines:**
- 3.1) Build climate change knowledge for better climate assessment
  - 3.2) Build knowledge base on climate change impacts and adaptation options in relevant sectors
  - 3.3) Build knowledge base on greenhouse gas mitigation options
  - 3.4) Develop appropriate mechanisms for continuous knowledge transfer and management to support policy-making and implementation in relevant agencies

- Examples of measures:**
- Provide support for R&D activities, focusing on but not limited to, the following fields:
    - Climate science – improvement of climate modeling
    - Climate change impacts on natural resources, ecosystems, agriculture, public health and industries
    - Weather-resistant crops and improved agricultural practices
    - Application of renewable energies and energy efficiency techniques in power generation, transportation, industrial processes, commercial and residential buildings
    - Climate risk management
  - Support development of centers of excellence in climate change-related fields

**STRATEGY 4: Raise awareness and promote public participation**

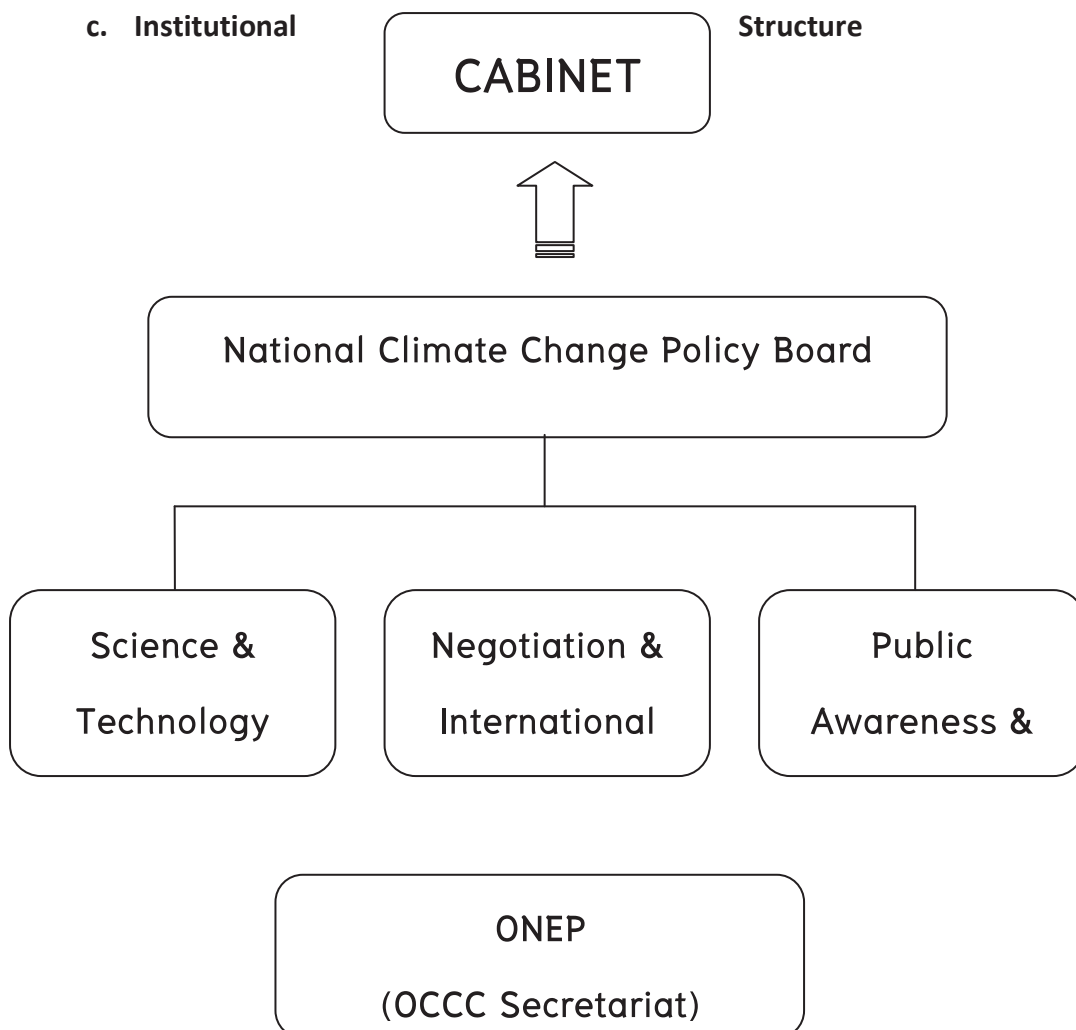
**Goal:** Better public awareness and understanding of their roles in response to climate change challenges

	<p><b>Guidelines:</b> 4.1) Organize public awareness campaigns and outreach activities on a regular basis</p> <p>4.2) Promote awareness in the educational sector</p> <p>4.3) Develop mechanisms to evaluate the effectiveness of campaigns and outreach activities on a regular basis</p>
<p><b>Examples of measures:</b></p>	<ul style="list-style-type: none"> <li>- Launch continuous public campaigns of climate change education</li> <li>- Encourage community participation in local planning processes to reduce vulnerabilities and adopt adaptation and mitigation options for identified climate change impacts</li> <li>- Provide public hearings of local and national plans</li> <li>- Encourage inclusion of climate change education in school curricular activities</li> </ul>
<p><b>STRATEGY 5: Build capacity of relevant personnel and institutions and establish a framework of coordination and integration</b></p>	
	<p><b>Goal:</b> Better coordination and integration among personnel and agencies involved in climate change implementation</p> <p><b>Guidelines:</b> 5.1) Support continuous training and skill development relevant to climate change implementation</p> <p>5.2) Create mechanisms to transfer knowledge and share experience among different agencies</p> <p><b>Examples of measures:</b></p> <ul style="list-style-type: none"> <li>- Establish national climate change information center with linked database to the climate change centers of excellence</li> <li>- Provide continuous staff training</li> <li>- Develop standardized archiving and documentation among relevant institutions</li> <li>- Establish effective negotiation teams</li> </ul>
<p><b>STRATEGY 6: Support international cooperation to achieve the common goal of climate change mitigation and sustainable development</b></p>	
	<p><b>Goal:</b> Build capacity of relevant personnel and agencies to create better coordination and integration to support and promote international cooperation relevant to climate change at the global and regional level</p> <p><b>Guidelines:</b> 6.1) Integrate climate change implementation under different international frameworks, such as UNFCCC, ASEAN and relevant bilateral and multilateral agreements</p> <p>6.2) Promote skill development and experience sharing among relevant agencies dealing with climate change-related</p>

international cooperation

- Examples of measures:**
- Ensure active participation in climate change conventions and conferences
  - Promote climate change cooperation among ASEAN members
  - Support the Clean Development Mechanism

The main objective of Thailand's Strategic Plan on Climate Change B.E. 2551-2555 (2008-2012) is to provide a comprehensive guideline of national responses to climate change challenges. It is essential that national-level and local-level agencies with relevant mandates develop their own action plan that corresponds to the guidelines set forth in the Strategic Plan. Thailand's Strategic Plan on Climate Change B.E. 2551-2555 (2008-2012) was approved by the Cabinet on 22 January 2008, and the Ministry of Natural Resources and Environment is now initiating the Action Plan Development Process among relevant agencies, expected to be completed this year.



**4. Please present barriers and issues regarding climate change mitigation, adaptation, and GHG inventory establishment/ development in your country.**

Thailand has adopted strategies to conserve energy and to use renewable energy, with a view to achieving ambitious targets. To meet such targets, advanced and economically sound technologies are vital. Under the existing market system, many technologies that contribute to greenhouse gas mitigation, such as solar and wind technologies, are technically possible but are not economically viable. Improving their economic viability is critical for Thailand, in order to effectively mitigate GHGs and to fulfill its commitments to the Convention. Obligations to support and facilitate technology transfer in the public sector of Annex I countries, as stated in Article 4.5 of the Convention, are key to the mitigation capacity of Thailand. Techniques, know-how and technologies to mitigate GHGs are needed, as follows:

- Analytical techniques to prioritize mitigation options for energy conservation and renewable energy
- Advanced technologies for energy conservation for electricity production and consumption
- Efficient technologies and systems for traffic and mass transport, especially for logistics
- Technologies for biomass and biogas energy production appropriate for local conditions
- Environment-friendly technologies for cement production
- Development of knowledge and infrastructure for innovation of clean technologies
- Technologies to mitigate GHG from rice paddy fields

**5. Please identify capacity building and assistance needs for climate change mitigation, adaptation, and GHG inventory establishment/ development in your country.**

- Analytical techniques to prioritize mitigation options for energy conservation and renewable energy
- Advanced technologies for energy conservation for electricity production and consumption
- Efficient technologies and systems for traffic and mass transport, especially for logistics
- Technologies for biomass and biogas energy production appropriate for local conditions
- Environment-friendly technologies for cement production
- Development of knowledge and infrastructure for innovation of clean technologies
- Technologies to mitigate GHG from rice paddy fields

## Questionnaire for “GHG Mitigation and Low Carbon Society”

### 1. Please summarize current status of climate change mitigation in your country.

#### a. National policy and Plan

The Philippines has had long years of effort to curb climate change. In 1991, the Inter-agency Committee on Climate Change was established by virtue of A.O. 220. In 1994, the Philippines ratified with the UNFCCC and in 2003 it ratified the Kyoto Protocol.

In 2009, the Republic Act 9729 (Climate Change Act) was enacted. Under this law, the following must be achieved:

- Creation of the Climate Change Commission
- National Framework Strategy on Climate Change
- National Climate Change Action Plan (NCCAP)

The main goal of NCCAP is to build the adaptive capacities of women and men in their communities, increase the resilience of vulnerable sectors and natural ecosystems to climate change, and optimize mitigation opportunities towards a gender-responsive and rights-based sustainable development.

#### b. Measures

##### Mitigation

Under the NCCAP, the enhanced adaptive capacity of communities, resilience of natural ecosystems, and sustainability of built environment to climate change is its mitigation component.

To be able to achieve the National Climate Change Action Plan (NCCAP), there are 7 Strategic Priorities: 100 Food Security, Water Sufficiency, Human Security Ecosystem and Environmental Stability, Climate-smart Industries and Services, Sustainable Energy, CC Knowledge and Capacity Development. Examples of these mitigation measures are:

Department of Energy – Sustainable Energy (RE ie Wind Farm)

Department of Agriculture – Organic Farming, Capacity Dev’t

Waste – Solid Waste Management

Department of Environment and Natural Resources – National Greening Program

#### c. Institutional Structure

The Commission shall be composed of the President of the Republic of the Philippines who shall serve as the Chairperson, and three (3) Commissioners to be appointed by the President, one of whom shall serve as the Vice Chairperson of the Commission.

Please submit your Questionnaire file to [natchanan@tgo.or.th](mailto:natchanan@tgo.or.th) and [benya\\_n@tgo.or.th](mailto:benya_n@tgo.or.th) by August 1, 2011



**2. Please summarize current status of climate change adaptation in your country.**

a. National policy and Plan

Under the RA 9729, this mandates that the following shall be formulated:

- Philippine Strategy for Climate Change
- Philippine Strategy for Climate Change Adaptation
- National Climate Change Action Plan (NCCAP)

b. Measures

Adaptation

The Adaptation measure under the NCCAP must accomplish successful transition towards climate-smart development.

Examples of adaptation measures under the NCCAP are:

Department of Environment and Natural Resources (DENR) - Adaptation to Climate Change and Conservation of the Biodiversity in the Philippines (AccBio) Project – Philippine Strategy on Adaptation Measures.

CCC – Vulnerability Assessment tools

National Disaster Risk Reduction Management Council and CCC – RA 10121 Calamity Fund can be tapped in DRR measures

c. Institutional Structure

The Commission shall be composed of the President of the Republic of the Philippines who shall serve as the Chairperson, and three (3) Commissioners to be appointed by the President, one of whom shall serve as the Vice Chairperson of the Commission.

### 3. Please introduce GHG inventory development in your country.

#### a. National policy and Plan

The Philippines submitted its 1<sup>st</sup> National GHG Inventory to the UNFCCC in 2000 with 1994 as its base year. In 2010, the Philippines submitted its 2<sup>nd</sup> National GHG Inventory to the UNFCCC with 2000 as its base year. This year, the Philippines will hopefully start proposing for the 3<sup>rd</sup> National GHG Inventory.

The Philippines has also a Local Government Unit (LGU) GHG Inventory and Corporate GHG Inventory.

For the LGU GHG Inventory, the latest presented to the government was that of Puerto Princesa, Palawan.

For the Corporate GHG Inventory, companies volunteer to do their GHG inventory through the PhilGARP project in 2006.

#### b. Institutional Structure

Based from the Second National Communication (SNC) to the UNFCCC, it was recommended that the CCC shall be the heading the National Communications of the Philippines. Under the CCC shall also have a Secretariat that will mediate or serve as the conduit in collecting the data from the five (5) sectors, namely, Energy, Land Use and Land Use Change of Forestry, Industry, Agriculture, and Waste. Each Sector shall have point Bureau or office that will be providing the data needed for the Inventory.

**4. Please present barriers and issues regarding climate change mitigation, adaptation, and GHG inventory establishment/ development in your country.**

a. Mitigation

CDM - There are currently 98 applications of which 54 are only registered.

b. Adaptation

The Philippines is currently scoping for Vulnerability Assessment (VA) Tools on which to use for CCA-DRR measures

c. GHG Inventory

During the SNC, the following were the issues:

Data quality, data availability and data accessibility

Different methodologies used for INC and SNC making it difficult to compare results

Lack of country-specific emission factors

Need to harmonize data available with what the UNFCCC worksheets need

Institutionalizing the GHG inventory

**5. Please identify capacity building and assistance needs for climate change mitigation, adaptation, and GHG inventory establishment/ development in your country.**

- a. Mitigation
  - Green Technologies – Capability to develop locally produced green technologies
  - Tools for Mitigation Analysis
  - Increase number and trainings of inventory and mitigation experts
  
- b. Adaptation
  - VA Tools – Development and or Provision of VA Tools to be used for CCA-DRR for all the different sectors.
  - Capacitate government agencies and communities to respond or adapt to climate variability and extreme events
  - Improvement of science-based knowledge in adaptation approaches, best practices, and technologies
  - Establishment of a knowledge management systems and dissemination
  - Creation of efficient use of CCA funds to mobilize new innovative financing
  
- c. GHG Inventory
  - Development of Local or Regional GHG Emission Factor
  - Institutionalization of data submission
  - Standardization of methodologies to be used for comparing results
  - Harmonization of data available with the UNFCCC worksheets
  
- d. Capacity needs and past assistance received from international donors (for example, JICA)
  - Climate Change Adaptation Strategies – AccBio Project (GIZ)
  - Climate Change Adaptation – MDGF
  - Climate Change Adaptation - PhilCCap – (GEF)
  - CCA-DRR – AusAID
  - Capacity Development – CDM (IGES)
  - Development of Policy Matrix - JICA

## Questionnaire for “GHG Mitigation and Low Carbon Society”

### 1. Please summarize current status of climate change mitigation in your country.

#### a. National policy and Plan

Being a Party to the UNFCCC and the Kyoto Protocol, Viet Nam has developed and issued a number of legal documents with the aim of attaining the UNFCCC's objective: "stabilization of greenhouse gas concentrations in the atmosphere at a level that would prevent dangerous anthropogenic interference with the climate system".

#### Legal documents

The National Assembly of Viet Nam has issued a number of environmental protection laws and regulations directly related to mitigation of GHG emissions as follows:

- Law on Environmental Protection No. 52/2005/QH11 dated 29th November 2005 (replaces the 1993 Law on Environmental Protection).
- Water Resources Law No. 08/1998/QH10 dated 20th May 1998.
- Petroleum Law (1993) No. 10/2008/QH12 dated 6th July 1993 (amended twice on 9th June 2000 and 3rd June 2008).
- Law on Minerals No. 2/1996/QH9 dated 1st September 1996 (amended on 27<sup>th</sup> June 2005).
- Law on Forest Protection and Development No. 29/2004/QH11 dated 3<sup>rd</sup> December 2004 (replaces the 1991 Law on Forest Protection and Development).
- Law of Electricity No. 28/2004/QH11 dated 3rd December 2004.
- Law on Energy Efficiency No. 50/2010/QH12 dated 28th June 2010.

#### Government-issued legal documents

In 2003, the National Environment Protection Strategy by 2010 and vision until 2020 was approved by the Prime Minister. The strategy aims to promote the application of clean technologies, cleaner production processes and the use of less polluting, more environmentally sound fuels and materials.

In 2006, the Government established the National Target Program on Energy Efficiency to raise public awareness, promote research and development of science and technology, and enforce regulations on energy conservation and efficiency. The Program sets a three to five percent conservation rate for national energy consumption for 2006-2010 and five to eight percent for 2011-2015.

In 2008, the Government approved the National Target Program to Respond to Climate Change. The main objective of the Program is to determine sectoral and regional impacts for each time period, so as to develop feasible action plans to effectively respond to climate change, in the short and long term, in order to achieve sustainable development, to seize opportunities to develop towards a low-carbon economy and to join the international community's efforts in mitigating climate change and protecting the climate system. The development and implementation of GHG mitigation options, such as CDM projects, have made substantial contribution to achieving the national sustainable development goals.

The NTP lays out nine targets and their means for 2009-2015, including the 93 formulation and implementation of GHG mitigation options.

In addition, the Government has also issued many other legal documents related to climate change response.

b. Measures

Mitigation options in energy

Fifteen GHG mitigation options were developed and evaluated for the energy sector using the LEAP model, including six options in energy efficiency and alternatives for the residential sector, two options in energy efficiency for industry, two options in energy efficiency and alternatives for transportation, one option in energy efficiency for the commercial/institutional sector and four options in renewable energy for energy industries. The GHG mitigation options in energy sector are as follows:

- Option E1: Innovative coal stoves Scenario assumptions: Innovative coal stoves with 30% efficiency rate will replace conventional coal-fired stoves with 22% efficiency in three million households by 2030. Each household formerly consuming 0.48 TOE/year would only consume 0.35 TOE/year using innovative stoves, leading to an aggregate 0.39 million TOE/year saving for three million households. The CO<sub>2</sub> mitigation potential of this option is approximately 25.3 million tCO<sub>2</sub>, at an abatement cost of US\$-17.4/tCO<sub>2</sub>.
- Option E2: Replacing coal with LPG in household cooking Scenario assumptions: 0.9 million households switch from coal to LPG for cooking activities by 2030. Each household formerly consuming 0.48 TOE/year using coal-fired stoves would only consume 0.14 TOE/year using LPG, leading to 432 thousand TOE/year decrease in demand for coal and a 126 thousand TOE/year increase in demand for LPG. The CO<sub>2</sub> mitigation potential of this option is approximately 22 million tCO<sub>2</sub>, at an abatement cost of US\$23.8/tCO<sub>2</sub>.
- Option E3: High-efficiency refrigerators Scenario assumptions: High-efficiency refrigerators will replace conventional models in six million homes by 2030. High-efficiency 102W fridges consuming 521 kWh/year replacing 120W models which consume 613 kWh/year would lead to a total reduction in electricity consumption of 552 million kWh/year (47.47 thousand TOE/year) by 2030. The CO<sub>2</sub> mitigation potential of this option is approximately 7.3 million tCO<sub>2</sub>, at an abatement cost of US\$12.3/tCO<sub>2</sub>.
- Option E4: Energy-saving compact fluorescent light bulbs Scenario assumptions: 30 million 16W compact fluorescent bulbs will be used for lighting instead of 75W incandescent bulbs by 2030. Compact fluorescent bulbs each consuming 16 kWh/year replace incandescent bulbs which consume 75 kWh/year. Total electricity consumption would fall by 1,770 million kWh/year (152.2 thousand TOE/year). The CO<sub>2</sub> mitigation potential of this option is approximately 23.4 million tCO<sub>2</sub> at an abatement cost of US\$-8.2/tCO<sub>2</sub>.
- Option E5: High-efficiency air conditioner Scenario assumptions: Three million conventional air conditioning units are replaced by high-efficiency air conditioners by 2030. Functioning 1,500 hours/year at 10,000 BTU, a conventional unit consumes 1,530 kWh whereas a high-efficiency model consumes 1,280 kWh. Aggregate electricity consumption for three million units would fall by 750 million kWh/year (64.5 thousand TOE/year). The CO<sub>2</sub> mitigation potential of this option is 9.9 million tCO<sub>2</sub> at an abatement cost of US\$-4.4/tCO<sub>2</sub>.

- Option E6: Solar water-heating appliances Scenario assumptions: 1.5 million households use solar water-heating appliances (such as solar boilers) by 2030. The use of solar water-heating appliances can save 700 kWh/household/year. Thus, by 2030, if 1.5 million families were to use solar-powered devices to heat water, electricity consumption would decrease by 1,050 million kWh/year (90.3 thousand TOE/year). The CO<sub>2</sub> mitigation potential of this option is 13.9 million tCO<sub>2</sub> at an abatement cost of US\$-6.2/tCO<sub>2</sub>.
- Option E7: High-efficiency electric motors Scenario assumption: 0.5 million conventional 15kW, 86% efficiency electric motors are replaced by more efficient (91%) electric motors by 2030. An average conventional motor consumes 61,047 kWh/year while a high-efficiency one consumes only 57,692 kWh/year. By 2030, the replacement of 0.5 million conventional electric motors with more efficient models would decrease electricity demand by 1,174.3 million kWh/year (101 thousand TOE/year). The CO<sub>2</sub> mitigation potential of this option is approximately 15.5 million tCO<sub>2</sub> at an abatement cost of US\$-24.9/tCO<sub>2</sub>.
- Option E8: Innovative brick kilns Scenario assumption: Six thousand conventional kilns are replaced by vertical shaft continuous kilns, at constant output of one million bricks per year, by 2030. While a traditional kiln requires 0.16 kg of coal to produce one brick, an improved
  - kiln only requires 0.08 kg per brick. The use of innovative brick kilns can save 235.2 thousand TOE/year by 2030. The CO<sub>2</sub> mitigation potential of this option is approximately 14.2 million tCO<sub>2</sub> at an abatement cost of US\$-5.1/tCO<sub>2</sub>.
- Option E9: Switching from DO to CNG in transportation Scenario assumption: By 2030, 30 thousand public buses will run on compressed natural gases (CNG) instead of diesel oil (DO). On average, a conventional diesel bus consumes 28.2 kg of diesel oil per 100 km, while a CNG-powered bus consumes 30.4 kg of CNG per 100 km. By 2030, with the shift from DO to CNG, demand for DO will drop by 350.3 thousand TOE/year, and demand for CNG will increase by 375.0 thousand TOE/year. The CO<sub>2</sub> mitigation potential of this option is approximately 2.1 million tCO<sub>2</sub> at an abatement cost of US\$-14.1/tCO<sub>2</sub>.
- Option E10: LPG-fuelled cabs Scenario assumptions: 200 thousand cabs run on LPG instead of normal gasoline by 2030. On average, a gasoline-powered cab consumes 6.5 kg of gasoline per 100 km while an LPG-powered one consumes 6.5 kg of LPG per 100 km. With 200 thousand taxi cars switching from petrol to LPG, demand for petrol will decrease by 707.0 thousand TOE/year and demand for LPG will increase by 679.3 thousand TOE/year. The CO<sub>2</sub> mitigation potential of this option is approximately 3.3 million tCO<sub>2</sub> at an abatement cost of US\$-11/tCO<sub>2</sub>.
- Option E11: Using high-press sodium lamps in public lighting Scenario assumptions: By 2030, there will be 1.2 million 15W high-press sodium lamps used in public lighting, instead of conventional 200W mercury vapor lamps. A mercury vapor lamp consumes 720 kWh/year, while a high-pressure sodium lamp only consumes 540 kWh/year. By 2030, with 1.2 million high-press sodium lamps in use, electricity consumption will decrease by 216 million kWh/year (18.576 thousand TOE/year).. The CO<sub>2</sub> mitigation

potential of this option is approximately 2.9 million tCO<sub>2</sub> at an abatement cost of US\$-22.8/tCO<sub>2</sub>.

- Option E12: Switching from coal-fired to LNG thermal power Scenario assumptions: By 2030, 500 MW of electricity produced by thermal power plants will be generated by LNG instead of coal. A LNG power plant has a 35% efficiency, US\$920/kW capital cost and US\$0.5/MWh operating cost. A coal power plant has a 25% efficiency, US\$1,230/kW capital cost and US\$3.0/MWh operating cost. The CO<sub>2</sub> mitigation potential of this option is approximately 16 million tCO<sub>2</sub> at an abatement cost of US\$15.1/tCO<sub>2</sub>.
- Option E13: Small-scale hydropower replacing coal thermal power Scenario assumptions: By 2030, 150 MW of coal-fired electricity will instead be produced by small-scale hydropower. A coal power plant has a 25% efficiency, US\$1,230/kW capital cost and US\$3.0/MWh operating cost. A small-scale hydroelectric power plant has a 100% efficiency, US\$1,700/kW capital cost and US\$1.0/MWh operating cost. Because the amount of electricity generated by a small-scale hydropower plant is relatively small-50% of its power, the generation of 150MW of electricity, a hydropower plant needs a capacity equivalent to 240 MW. The CO<sub>2</sub> mitigation potential of this option is approximately 15.3 million tCO<sub>2</sub> at an abatement cost of US\$-7.2/tCO<sub>2</sub>.
- Option E14: Wind power replacing coal-fired thermal power Scenario assumptions: By 2030, 200 MW of coal-fired thermal power will instead be produced by wind power. A coal power plant has a 25% efficiency, US\$1,230/kW capital cost and US\$3.0/MWh operating cost. A wind power station has a 100% efficiency, US\$1,200/kW capital cost and US\$0.5/MWh operating cost. Since a wind power station only generates electricity equal to about 25% of its power, the generation of 200MW of electricity requires a wind power station with a capacity of 640 MW. The CO<sub>2</sub> mitigation potential of this option is approximately 14.2 million tCO<sub>2</sub> at an abatement cost of US\$16.2/tCO<sub>2</sub>.
- Option E15: Rice husk power replacing coal thermal power Scenario assumptions: By 2030, 100MW of electricity generated by coal will be replaced by rice husk-fuelled thermal power plants. A coal power plant has a 25% efficiency, US\$1,230/kW capital cost and US\$3.0/MWh operating cost. A rice husk power plant has a 33-80% efficiency, US\$1,750/kW capital cost and US\$6.0/MWh operating cost. The CO<sub>2</sub> mitigation potential of this option is approximately 6.9 million tCO<sub>2</sub> at an abatement cost of US\$6.6/tCO<sub>2</sub>.

#### Mitigation options in agriculture

- Option A1: Biogas replacing cooking coal in lowlands Scenario assumptions: Coal is to be gradually replaced by gas for cooking as lowland households are equipped with 336,000 biogas tanks. The increase will be from 3,000 tanks in 2010 to 168,000 tanks in 2020 and finally 336,000 tanks in 2030. The GHG mitigation potential for this option is 17.4 million tCO<sub>2</sub> at an abatement cost of US\$4.1/tCO<sub>2</sub>.
- Option A2: Biogas replacing cooking coal in mountain areas Scenario assumptions: Coal is to be gradually replaced by gas for cooking as mountain areas households are equipped with 224,000 biogas tanks. The increase will be from 2,000 tanks in 2010 to 112,000 tanks in 2020 and finally 224,000 tanks in 2030. The GHG mitigation potential of this option is 5.2 million tCO<sub>2</sub> at an abatement cost of US\$9.7/tCO<sub>2</sub>.



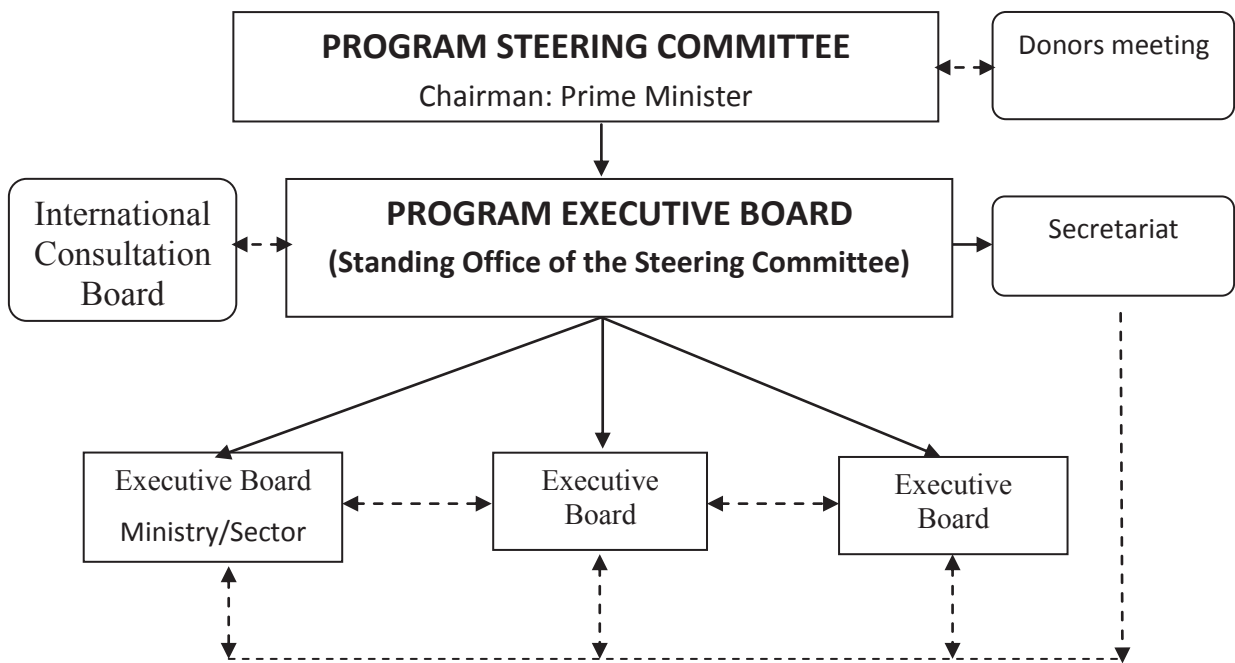
- Option A3: Rice paddy field water drainage in the Red River Delta Scenario assumptions: An active irrigation and drainage system ensuring adequate water supply has been used for one million ha of rice paddies in the Red River Delta, with 50,000 ha in 2010, 700,000 ha by 2020 and finally 1,000,000 ha by 2030. The GHG mitigation potential of this option is 21.9 million tCO<sub>2</sub>, at an abatement cost of US\$5.2/tCO<sub>2</sub>.
- Option A4: Rice paddy field water drainage in the South Central Coast Scenario assumptions: An active irrigation and drainage system ensuring adequate water supply has been applied to 200,000 ha of rice paddies in the South Central Coast with 30,000 ha in 2010, 150,000 ha by 2020 and finally 200,000 ha by 2030. The GHG mitigation potential of this option is 4.1 million tCO<sub>2</sub>, at an abatement cost of US\$6.99/tCO<sub>2</sub>.
- Option A5: MUB cattle feeds Scenario assumptions: 292,000 dairy cattle will be fed Molasses Urea Block (MUB) by 2030. The number of MUB-fed cattle will be 73,000 heads in 2010, 182,000 by 2020 and 292,000 by 2030. The GHG mitigation potential of this option is 7.9 million tCO<sub>2</sub>, at an abatement cost of US\$-10.9/tCO<sub>2</sub>.

#### GHG mitigation options in LULUCF

- Option F1: Protection and sustainable management of existing production forest
- Areas Scenario assumption: Over a 40-year period, two million ha of existing timber forest will be protected. The carbon sink enhancement potential for this option is 904 million tCO<sub>2</sub>, at an abatement cost of US\$1.36/tCO<sub>2</sub>.
- Option F2: Conservation of existing protection forests Scenario assumptions: Over a 40-year period, 2.5 million ha of existing protection forests will be preserved. The carbon sink enhancement potential of this option is 1,153 million tCO<sub>2</sub>, at an abatement cost of US\$0.77/tCO<sub>2</sub>.
- Option F3: Reforestation of large timber forests in conjunction with natural Regeneration Scenario assumptions: Over a 40-year period 100,000 ha of large timber forests will be planted and surrounded for natural regeneration. Between 2001 and 2010, 5,000 ha of forests will be grown each year, 3,000 ha/year between 2011 and 2020, 1,500 ha/year between 2021 and 2030 and 500 ha/year from 2031 to 2040. The carbon sink enhancement potential of this option is 80.5 million tCO<sub>2</sub>, at an abatement cost of US\$0.38/tCO<sub>2</sub>.
- Option F4: Planting long-rotation large timber trees Scenario assumptions: Over a 40-year period, 400,000 ha of timber forests will be planted, at a rate of 6,500 ha/year from 2001 to 2010, 14,500 ha/year between 2011 and 2020, 14,200 ha/year between 2021 and 2030, and 4,800 ha/year from 2031 to 2040. The carbon sink enhancement potential of this option is 271 million tCO<sub>2</sub>, at an abatement cost of US\$0.55/tCO<sub>2</sub>.
- Option F5: Planting fast-growing trees for lumber Scenario assumptions: Over a 15-year period, 600,000 ha of timber forests, such as acacia or eucalyptus, will be planted, at a rate of 90,000 ha/year for the first 5 years, 33,330 ha/year for the following 3 years and 10,000 ha/year for the next 5 years. The carbon sink enhancement potential of this option is 297 million tCO<sub>2</sub>, at an abatement cost of US\$0.81/tCO<sub>2</sub>.

- Option F6: Planting short-rotation pulpwood forest Scenario assumptions: Over a 15-year period, 600,000 ha of pulpwood forests, such as acacia, eucalyptus, etc., will be planted, at a rate of 86,000 ha/year for the first 5 years, 33,330 ha/year for the following 3 years and 17,500 ha/year for the next 4 years. The carbon sink enhancement potential of this option is 176.8 million tCO<sub>2</sub>, at an abatement cost of US\$1.38/tCO<sub>2</sub>.
- Option F7: Growing long-rotation non-timber product forest Scenario assumptions: Over a 40-year period, 200,000 ha of long-rotation non-timber forests (e.g. Sumatran pine or three-needled pine) will be grown at a rate of 10,000 ha/year for the first 10 years, 8,000 ha/year for the following 10 years and 2,000 ha/year for the next 10 years. The carbon sink enhancement potential of this option is 118.9 million tCO<sub>2</sub>, at an abatement cost of US\$0.48/tCO<sub>2</sub>.
- Option F8: Planting melaleuca forest on alkaline wetlands Scenario assumptions: Over a 15-year period, 50,000 ha of melaleuca forests will be planted on alkaline wetlands at an average rate of 5,000 ha/year. The carbon sink enhancement potential of this option is 25 million tCO<sub>2</sub>, at an abatement cost of US\$0.59/tCO<sub>2</sub>.

c. Institutional Structure



Note: —————> Guide and direct  
 <-----> Collaboration, support and exchange information

## 2. Please summarize current status of climate change adaptation in your country.

### a. National policy and Plan

Basing on the assessment of climate change variability, agreed climate change scenarios, the assessment of climate change impacts, relevant ministries, sectors, and localities should take initiative in developing their own action plans to respond to climate change.

Emphasis are made to those sectors, region sensitive and vulnerable to climate change, such as: (1) Water resources, land use, ecosystem, (2) agriculture, forestry, aquaculture; energy; construction; transportation; public health, tourism, likelihood; (3) Mekong delta, Red River delta, and coastal zones.

- Targets to be achieved:

- *Targets to be achieved by 2010*

- + Framework documents, action plans for coping with climate change are basically developed for the fields, sectors and localities venerable and sensitive to climate change;
- + Action plans are implemented in the localities and ministries that manage fields, sectors and localities vulnerable and sensitive to climate change.

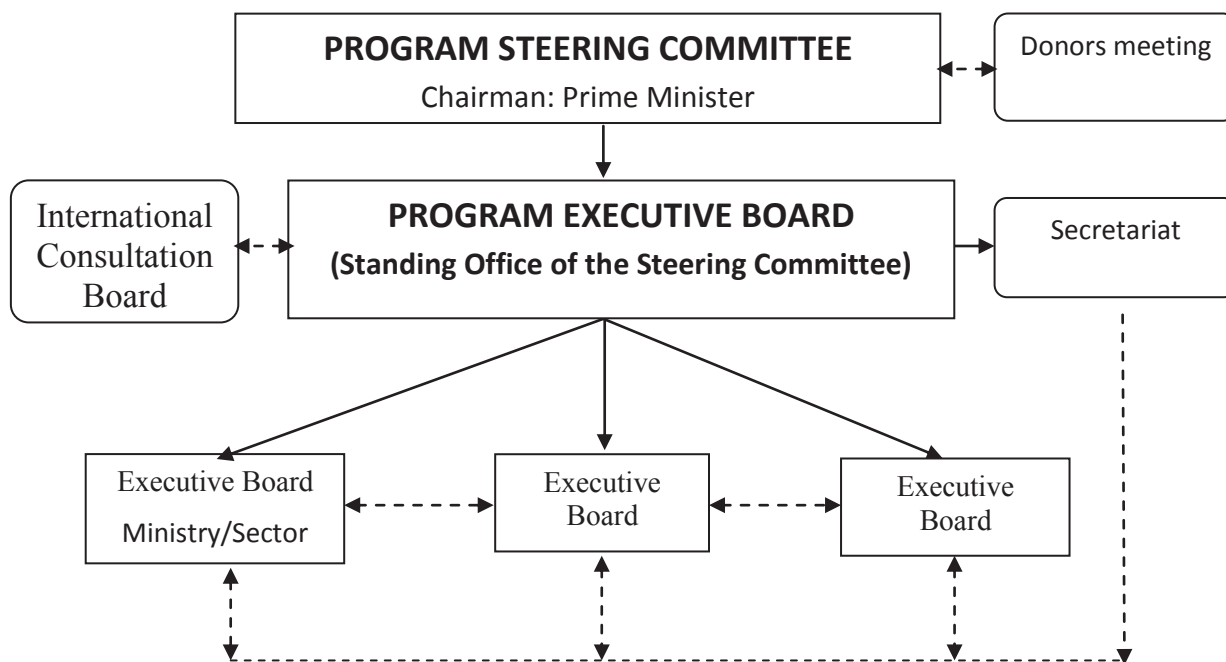
- *Targets to be achieved by 2015*

- + Action plans for climate change adaptation and mitigation in the main fields will be implemented throughout in all relevant sectors and levels.

### b. Measures

- Formulate plans for sustainable water resources development of all river basins and regions based on the national social and economic development planning. Review the existing and build new hydrologic and hydropower reservoirs, dams, and dykes, taking into account the impacts of climate change.
- Reinforce, upgrade, complete the existing structures and add new water resource infrastructure, including dams, reservoirs, drainage channel networks, irrigation systems, groundwater wells, and water tanks, etc., to improve operational efficiency and safety.
- Reinforce and upgrade the existing system of river and sea dykes, flood diversion areas, flash flood relief channels, embankments for flood protection, and saltwater intrusion barriers. Begin construction of new dykes and introduce new artificial drainage structures (pump stations) into low-lying plains and coastal flood-prone areas.
- Promote water efficiency and conservation, and widely practice water-saving irrigation methods in agriculture, such as spray, and drip irrigation.
- Upgrade and modernize the observation and long-range water resources forecasting network, seasonal and yearly forecasting for water resources and natural disasters (e.g. flooding, drought, salinity intrusion). Develop warning systems for flash floods and debris floods, with priority for mountainous areas in Northern and Central regions).
- Raise public awareness on climate change impacts on water resources, improve water use efficiency and promote the protection of water resources.

c. Institutional Structure



Note: ———> Guide and direct  
 <---> Collaboration, support and exchange information

**3. Please introduce GHG inventory development in your country.**

a. National policy and Plan

Viet Nam has carried out two GHG inventory reports under National Communication Reports. The first one was implemented in 2000 for the year inventory 1994 and the second report was performed in 2009 for the year inventory 2000.

GHG inventory for the year 1994 was implemented for main emission sector: energy, industrial processes, LULUCF, agriculture and waste. The inventory methodology was IPCC Guideline version 1996 and UNFCCC Guideline for developing National Communication Report for Non-Annex I countries. Almost emission factors are default factors in IPCC Guideline 1996, and some emission factors of Thailand, India. Particularly, CH<sub>4</sub> emission factor for undated rice field using fertilizers was Vietnamese experimental results under the Asian CH<sub>4</sub> Experimental Program.

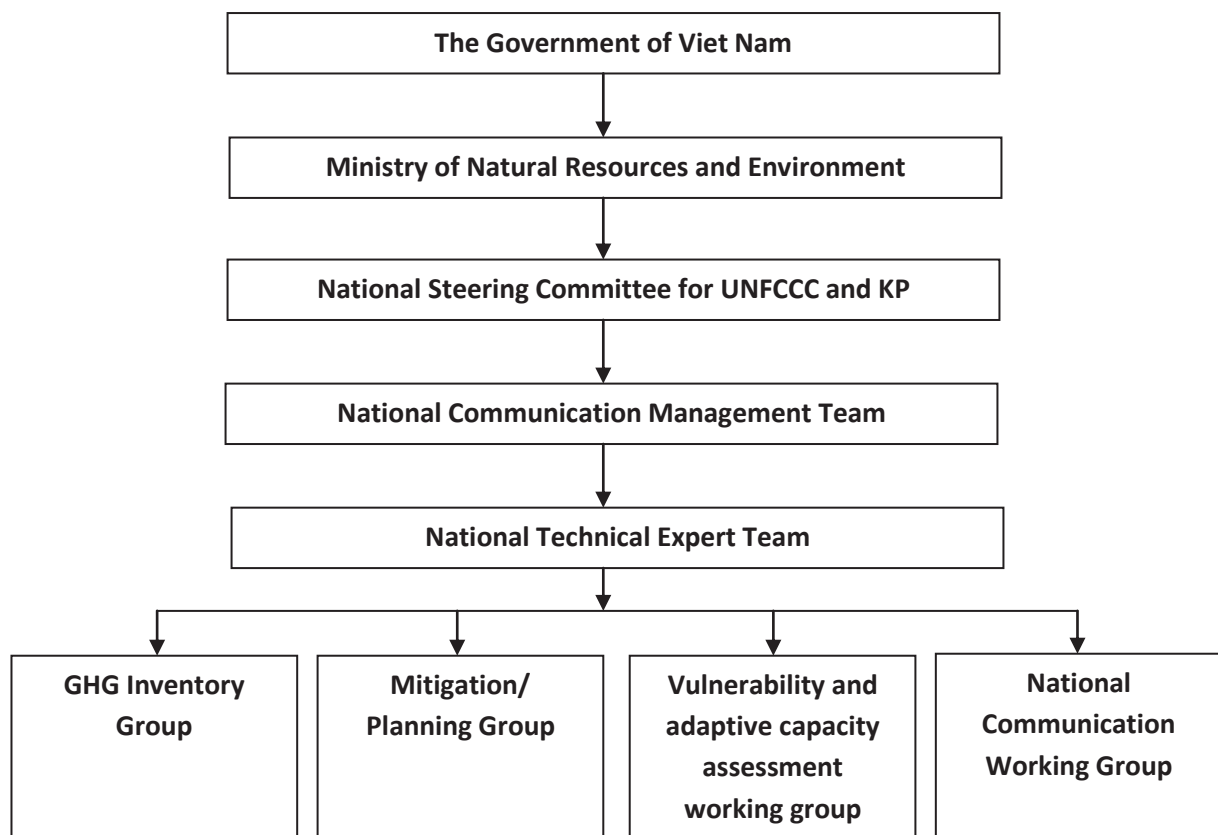
The national GHG inventory for the year 2000 was carried out in accordance with the Revised 1996 IPCC Guidelines for National Greenhouse Gas and IPCC Good Practice Guidance for the energy, industrial processes, agriculture, LULUCF and waste sectors, covering the main greenhouse gases which are carbon dioxide (CO<sub>2</sub>), methane (CH<sub>4</sub>) and nitrous oxide (N<sub>2</sub>O).

Activity data for the national GHG inventory was compiled from published data in National Statistical Yearbooks, from ministries, agencies and published research results from institutes, research centres, companies and private businesses.

The majority of emission factors used are default values taken from the Revised 1996 IPCC Guidelines. In addition, certain country-specific emission factors were also developed and used for the inventory, such as CH<sub>4</sub> emission factor for rice paddies.

**b. Institutional Structure**

The Ministry of Natural Resources and Environment (MONRE) is designated as the National Focal Point to coordinate the national greenhouse gas inventory for the base year 2000 with other relevant Ministries and sectors. The National GHG Inventory Working Group is composed of technical experts from the public and private sectors, and non-governmental organizations (NGOs).



**4. Please present barriers and issues regarding climate change mitigation, adaptation, and GHG inventory establishment/ development in your country.**

**a. Mitigation**

- Insufficient long-term planning information and data.

- Some IPCC emission factor defaults for energy technologies may not be suitable when applied to Viet Nam's in current national circumstances.
- The technical capacity to apply models for the development and assessment of mitigation options and mitigation projects remains limited.

b. Adaptation

- The application of the MAGICC/SCENGEN 5.3 model in the development of climate change scenarios, which produces maps on a standard low resolution grid, makes it difficult to accurately reflect the intraregional nuances of climate change in Viet Nam.
- The database for impact assessments and adaptation measures development, particularly data used in adaptation measure cost-benefit analyses, is incomplete.
- Adaptation impact assessment and response measure development models and tools are lacking, in particular for cross-sector or inter-regional assessments.
- There is a shortage of technical experts with the capacity to run impact assessment and adaptation measure development models.

c. GHG Inventory

- Reliable and synchronous data and information are sparse, and the data collection process is slow.
- The data collection system for greenhouse gas inventory is incomplete and there is a shortage of Ministry and sector-level GHG inventory technical experts.
- Research, assessment and verification for certain country-specific emission factors remains incomplete.

**5. Please identify capacity building and assistance needs for climate change mitigation, adaptation, and GHG inventory establishment/ development in your country.**

a. Mitigation

- It is necessary to assess the level of technological demand in climate change mitigation and adaptation to seize opportunities to steer development towards a lowcarbon economy through the implementation of climate change, particularly CDM, projects
- Technical experts and professionals need to be trained in order to facilitate the prompt and successful adoption of new technologies.

b. Adaptation

- Legislation to guide and support the implementation of the UNFCCC and climate change response programs in Viet Nam must continue to be concretized, while coordination between ministries, sectors and provinces needs to be enhanced and strengthened for the development of climate change response action plans.
- It is necessary to formulate plans and develop awareness-raising programs for the whole population, climate change education and training programs in school curricula,

and continue to organize climate change knowledge-building campaigns and educational competitions through the mass-media.

c. GHG Inventory

- There are needs of reliable and synchronous data and information, and good data collection process.
- There are needs of data collection system for greenhouse gas inventory and a number of Ministry and sector-level GHG inventory technical experts.
- Research, assess and verify certain country-specific emission factors.

d. Capacity needs and past assistance received from international donors (for example, JICA)

- Scenario building using new and highly reliable models and tools for the entire territory and for each specific economic region.
- Determination of Viet Nam-specific emission factor values, through survey and analysis, in order to reduce national greenhouse gas inventory uncertainty levels.
- Assessment of vulnerability for ecosystems, economic and social impacts from climate change and development of appropriate adaptation measure that include policy measures.
- Application of cost-benefit analysis to assess climate change response measures and solutions.

## Questionnaire for “GHG Mitigation and Low Carbon Society”

### 1. Please summarize current status of climate change mitigation in your country.

#### a. National policy and plan

Although Myanmar has not issued particular climate policy statement, there are some provisions and ministerial policy statements which contain climate policy. Myanmar has adopted the National Environment Policy in 1994. The Constitution of the Republic of the Union of Myanmar, adopted in May 2008 by referendum, has some provisions for protection of natural environment.

The Ministry of Forestry issued its policy statement in 1995 and it has many provisions which relates to climate policy. Myanmar forest law and rule are set as the tools to implement national forest policy. Forest policy targeted to manage 30 percent of total land area under Permanent forest estate comprising reserved forests and protected public forests. National Forest Master Plan was developed in 2001 to achieve sustainable forest development. It foresees 30 years from 2001/2002 to 2030/31 and outlines wide range of forest activities including wildlife and nature conservation.

Likewise, the policy statement of the Ministry of Energy highlights in energy independence; wider use of new and renewable sources of energy; promoting energy efficiency and conservation; and promoting utilization of alternative fuel in household.

To mitigate the primary generation of waste, a major source of methane emission, policies to minimize waste are being implemented. To minimize waste at its generation stage, guidelines for waste reduction at works, indicating the responsibilities of the waste producers, are needed. At the distribution stage, polices to improve the packing materials are being implemented.

Please submit your Questionnaire file to [natchanan@tgo.or.th](mailto:natchanan@tgo.or.th) and [benya\\_n@tgo.or.th](mailto:benya_n@tgo.or.th) by August 1, 2011



## **b. Measures**

As practical implementation for mitigation, re-forestation activities both in natural forests and drier areas are comprehensively undertaken. The Union of Myanmar has a forest cover of around 47 % of the total land area and they are mostly natural forests. Until now a total of more than 500, 000 hectares of forest plantations were established throughout the country. Dry Zone Greening Department was established in 1997 to make the dry region green. Until now, the Department has formed a total of 117,000 ha of plantations in the region.

Electricity generation through HYDRO power stands at the top with the highest percentage of 64.7%, followed by natural gas at 20.3%. Electricity generation by using coal and diesel is at 4.7 and 2.2% respectively. Electricity generation through hydro and gas is thus cleaner than that of power generation through coal. This reveals that power generation in the Union of Myanmar is clean and thus the country is not a net emitter.

To reduce emission from transportation, energy policy in transportation sector is to use Natural Gas in the place of petrol and diesel for some vehicles in short term and bio-fuel in the long term. Conversions of fossil-fuel use vehicles into CNG cars are encouraged.

With regard to the protection of the ozone layer, Myanmar has also being carried out some projects such as the Institutional strengthening project for the establishment of National Ozone Unit, Preparation of Ozone Regulations, Project for CFC Monitoring of Implementation of Refrigerant Management Plan (RMP) activities and project for establishing conversion practice of domestic refrigerators. Awareness promotion activities on protection of the ozone layer, training programs for refrigeration and air conditioning service technicians, and training programs for enforcement officers have also been conducted.

Recycling of plastic wastes, reuse and recycling of wood and agricultural residues are being promoted in recent years. Recycling of waste papers, rubber goods, broken glass wares, steel and various metals, broken plastics and steel pipes, etc are being done in Myanmar long before 3Rs concepts has been introduced.

Myanmar has implemented the Initial National Communication (INC) project by the assistance of Global Environment Facility (GEF) and it is now just need to submit the report to UNFCCC.

## **c. Institutional Structure**

Myanmar formed National Commission for Environmental Affairs (NCEA) in February 1990 and the Commission acts as a national focal point for environmental matters and promote environmentally sound and sustainable development activities in Myanmar. The National Environment Conservation Committee (NECC) was formed in 2004 and reformed in 2011 with the representatives from relevant ministries as members who are responsible for monitoring the environmental conservation activities at different administrative levels. Both NCEA and NECC are chaired by the Minister for Forestry.

## 2. Please summarize current status of climate change adaptation in your country.

### a. National policy and Plan

Myanmar is still lack of national strategy and action plan for adaptation to climate change. However, ministries are implementing necessary actions to adapt the climate change in each sector. The Ministry of Forestry issued its policy statement and it has many provisions which relates to adaptation of climate change. Supporting of Myanmar forest policy includes enactment of new forest law, enactment of Protection of Wildlife, Wild Plants and Conservation of Natural Areas Law, issuance of Community forestry instruction. Likewise, the policy statement of the Ministry of Health contains some statements on mitigate impact of climate change. Myanmar has formulated national sustainable development strategies. Myanmar has developed strategies for water resources availability. Myanmar Action Plan on Disaster Risk Reduction (MAPDRR) 2009-2015. The Plan has identified projects and activities which are necessary to meet the Hyogo Framework for Action (HFA) and ASEAN Agreement on Disaster Management and Emergency Response Commitments.

### b. Measures

Myanmar has been implementing a large number of forest conservation and development programs that have been potential to reduce the vulnerability of forest ecosystems to the impacts of climate change. A large reforestation program is leading to the conservation of biodiversity and reduction of forest degradation. Involvement of local communities in forest protection and regeneration and creation of long term stake in forest health are being carried out. To mitigate health hazards, Myanmar is undertaking certain measures such as improvement in the construction of houses and health infrastructures with new designs, improvement in environmental practices and preparation and implementation of disaster management plans. For disease control activities, vaccination against diseases, basic health care and preventive services and community awareness raising the disease outbreaks are carried out. In water sector, Myanmar is being sought to improve access to water availability. Measures are taken in accordance with annual investment plan. The Project of the National Adaptation Programme of Actions (NAPA) which is funded by UNEP-GEF has been started. Project Executing Agency is Department of Metrological and Hydrology, Ministry of Transport, in cooperation with National Commission for Environmental Affairs (NCEA).

### c. Institutional Structure

The National Disaster Preparedness Central Committee (NDPCC) was formed in 2008. The National Environment Conservation Committee and its related line ministries are responsible for adaptation of climate change.

**3. Please introduce GHG inventory development in your country.**

Myanmar is yet to be developed National Policy and plan for greenhouse gases inventory. Apart from the preliminary greenhouse gases inventory and mitigation options assessment undertaken in the ALGAS-study based on some limited 1990 data, very limited activities on climate change have been undertaken in Myanmar. Under the INC project of Myanmar, the GHG inventory team made a particular initiative in the context of improving and updating the reliable data on GHG emission/absorption in Myanmar. The team conducted the national inventory on GHGs by setting the year 2000 as the base year, and prepared database for energy sector, industrial processes and product use sector, Agricultural sector, land use change and forestry sector, and waster sector.

4. Please present barriers and issues regarding climate change mitigation, adaptation, and GHG inventory establishment/ development in your country.

**Barriers and issues regarding climate change mitigation, adaptation, and GHG Inventory establishment/ development**

Limited capacity at all levels (human, scientific, technical, technological, organizational, institutional and resource capabilities) relating to climate change issues, limited capacity in climate negotiation, limited capacity in preparation of climate change projects for bilateral and multilateral funding, limited capacity in assessing the impacts of both technological and policy measures for mitigation and adaptation, limited capacity in effective implementation of various multilateral environmental agreements, including the UNFCCC are prominent barriers.

**5. Please identify capacity building and assistance needs for climate change mitigation, adaptation, and GHG inventory establishment/ development in your country.**

**a. Capacity building and assistance needs for Mitigation, Adaptation and GHG Inventory**

There is a basic need for a continuing training and capacity building program that covers all major aspects relating to climate change at educational, scientific (GHG inventory, climate scenario), technical, technological (mitigation & adaptation), legal and policy levels, both nationally and locally. There is a need for regular participation in regional and international forums to share information and experiences. Training in V&A assessment in the sector of coastal zone (including tidal movement and sea level measurements), marine resources and coral reefs, forestry, agriculture and waste management are needed. Capacity building in identifying, evaluating and verifying appropriate and environmentally sound technologies is essential need. Capacity building in assessment of the impacts of both technological and policy measures for mitigation and adaptation is required. There is a training requirement for legal officers and policy makers for combating the climate change. There is a need to improve in international negotiation skills.

Financial resources for climate change outreach programs and activities are needed in Myanmar at present. As a developing country, Myanmar needs adequate and continuous financial assistance from the developed nations for long term research projects on climate change.

Therefore, Myanmar's contribution to global climate change certainly depends to a great extent on transfer of technologies and capacity building, as well as on funding support from international governments, NGOs and donor agencies.

**b. Capacity needs and past assistance received from international donors**

ALGAS project, INC project and NAPA project are funded by GEF. Myanmar has received technical assistance from UNEP, UNESCAP for formulation of INC and NAPA projects.

**Questionnaire for “GHG Mitigation and Low Carbon Society”**

**1. Please summarize current status of climate change mitigation in your country.**

a. National policy and Plan

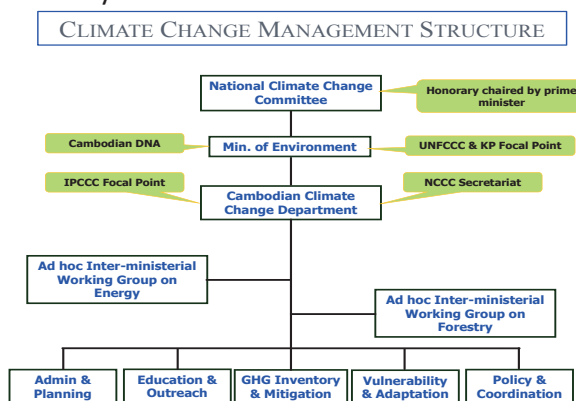
Cambodia ratified the UN Framework Convention on Climate Change (UNFCCC) in 1995 and acceded to the Kyoto Protocol in 2002. As a party to the UNFCCC, Cambodia fully supports the efforts to address climate change based on the key principles of the UNFCCC, namely “common but differentiated responsibilities and respective capabilities”, “specific needs and special circumstances of developing country parties, especially those that are particularly vulnerable to the adverse effects of climate change and their right to promote sustainable development” and the “precautionary principle”.

b. Measures

Cambodia recognizes important measures for adaptation, mitigation, technology transfer, financial assistance, and capacity building to address climate change. It promptly took action on national adaptation program of action, focusing on measures that have direct impacts on the livelihoods of local people, in particular the poorest, and the voluntary approaches for greenhouse gas emission reduction such as the Clean Development Mechanism (CDM), REDD+, and other green growth and/or low carbon development activities. The recognition and implementation of climate change activities have been emphasized in the National Strategic Development Plan update 2009-2013. However, a general national target for emission reduction including national a carbon accounting system has not been discussed and agreed upon.

c. Institutional Structure

As a party to the UNFCCC, The Royal Government of Cambodia appointed the Ministry of Environment to be a focal point to the UNFCCC, KP and IPCC; and set up the Designed National Authority (DNA) and its supporting ad-hoc working groups for overseeing the development and implementation of CDM activities. The Royal Government of Cambodia also established the National Climate Change Committee (NCCC) with the mandate to prepare, coordinate and monitor the implementation of policies, strategies, legal instruments, plans and programs of the Royal Government to address climate change issues. The Ministry of Environment established the climate change department which serves as the secretary to NCCC.



Please submit your Questionnaire file to [natchanan@tgo.or.th](mailto:natchanan@tgo.or.th) and [benya\\_n@tgo.or.th](mailto:benya_n@tgo.or.th) by August 1, 2011

## 2. Please summarize current status of climate change adaptation in your country.

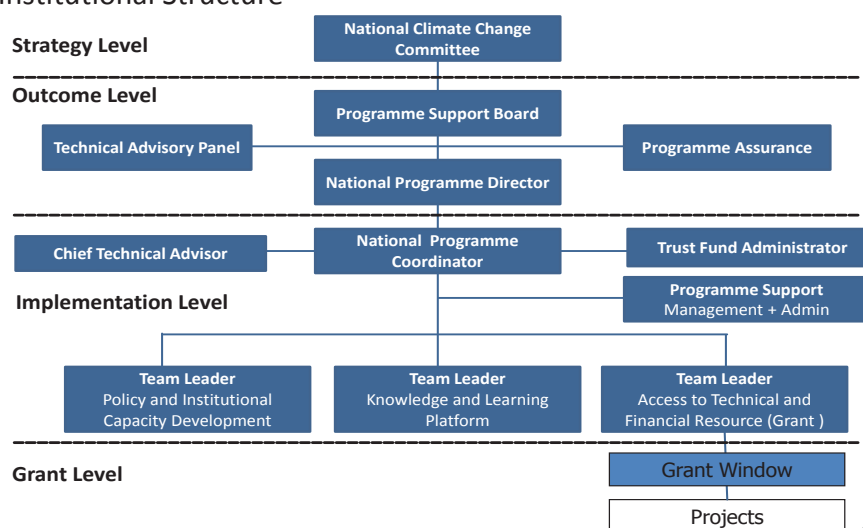
### a. National policy and Plan

National Adaptation Program of Action (NAPA) was adopted by the government in 2006. It defined 39 no-regret adaptation projects in agriculture, water resources, coastal zone and human health. The NAPA follow-up projects are being implemented by selected concerned government ministries with support from relevant development partners. The recently implemented Cambodia Climate Change Alliance (CCCA) is nationally owned and aligned with Cambodia's development priorities. CCCA is a multi-donors program funded by EU, Danida, Sida and UNDP. The program consists of four main elements such as policy and institutional capacity development, knowledge and learning, grand window, and trust fund development and management. Cambodia also has another program called "the Pilot Program for Climate Change Resilience (PPCR), which is supporting by the Asian Development Bank and the World Bank. PPCR is designed to i) integrate climate resilience into development plans by scaling up and leveraging climate-resilient investment and targeting resources where they are most needed, and ii) providing incentives for scaled-up and transformational change by strengthening capacities for mainstreaming and enabling learning-by-doing and sharing of lessons at the country, regional and global levels.

### b. Measures

The adaptation programs are the country-led and country-driven. It built on NAPA, national communications and other relevant country studies and strategies. The programs must be complements to each other and to the country adaptation initiatives and supporting actions that are consistent with development and poverty reduction goals.

### c. Institutional Structure



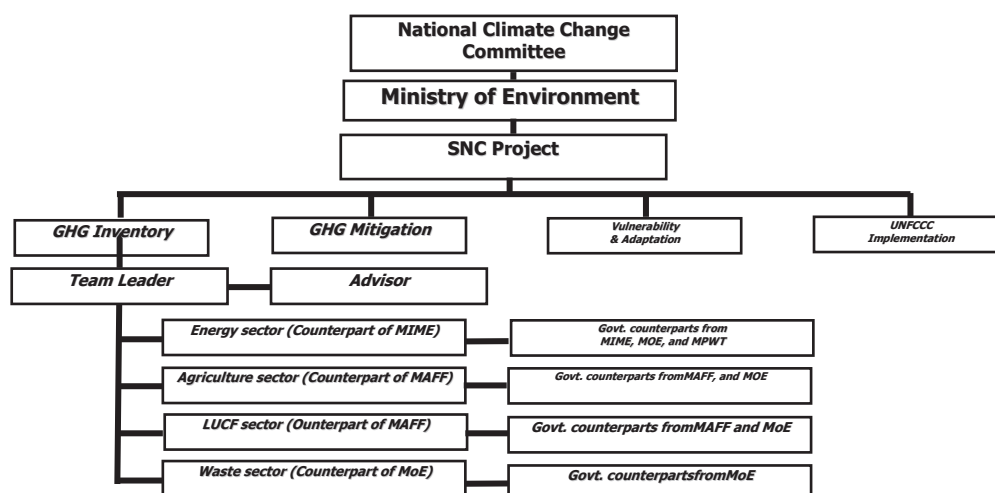
### 3. Please introduce GHG inventory development in your country.

#### a. National policy and Plan

The mandate of national greenhouse gas inventory is set in the sub-decree of the establishment of the National Climate Change Committee. In the future national communication preparation, the GHG Inventory office plans to apply ALU (Agriculture and land use change) software and UNFCCC inventory software for greenhouse gas inventory preparation and reporting. The office planned to engage broader participation with high responsibility from various key stakeholders including governmental ministries, universities in specific sector inventory activities. Other carbon accounting systems including MRV and country verification and reporting (VER), new market mechanisms, are under consideration and discussion.

#### b. Institutional Structure

The existing institutional structure of national GHG Inventory is a subject to further restructuring. Decentralization of specific GHG inventory responsibility to the related sectors requires comprehensive capacity building, coordination and facilitation. The figure below shows the inventory structure and procedure applied in the second national communication preparation.





**4. Please present barriers and issues regarding climate change mitigation, adaptation, and GHG inventory establishment/ development in your country.**

a. Mitigation

- Insufficient of individual and institution capacity
- Institutional cooperation and coordination are considerably insufficient
- Limited of financial resources
- Lack of national and sectoral policy, goal and target
  - Specific barriers with bio-digester program
    - Investment barrier with such small scale projects
    - Lack of financial support
    - Macroeconomic development, and
    - Carbon finance.

b. Adaptation

- Limited of individual and institution capacity
- Institutional cooperation and coordination is considerably insufficient
- Limited of financial resources?
- Incomprehensive national and sectoral policy, goal and target

c. GHG Inventory

- Insufficient activity data and emission factors
- Lack of sustainable data management system,
- Limited human resources(project-based)
- Coordination and facilitation among line government ministries and agencies is insufficient
- Lack of financial support.

**5. Please identify capacity building and assistance needs for climate change mitigation, adaptation, and GHG inventory establishment/ development in your country.**

a. Mitigation

- Improving individual and institution capacity
- Strengthening institutional cooperation and coordination among stakeholder
- Mobilizing financial resources
- Mainstreaming climate change concept, knowledge including green growth and other low carbon initiatives to government institutions/agencies, private sector, NGOs, civil society organization, local communities.

b. Adaptation

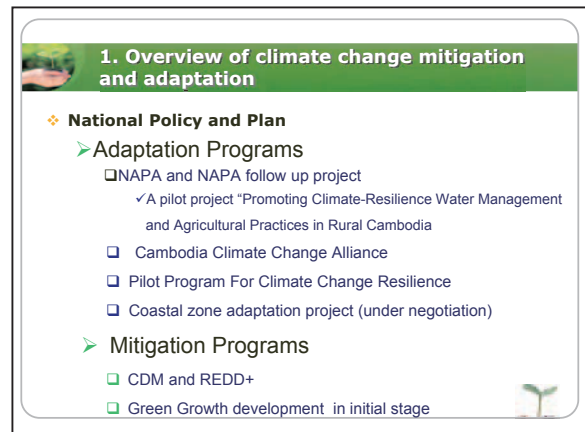
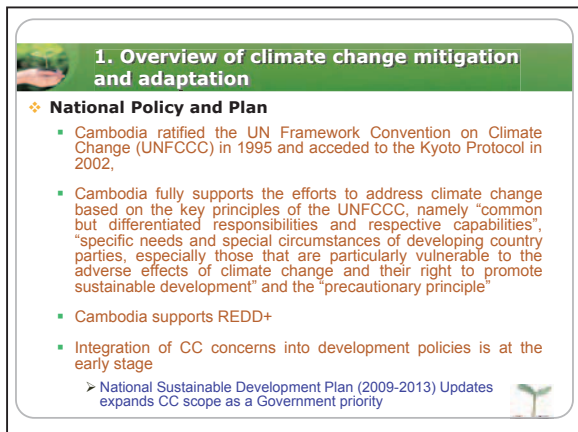
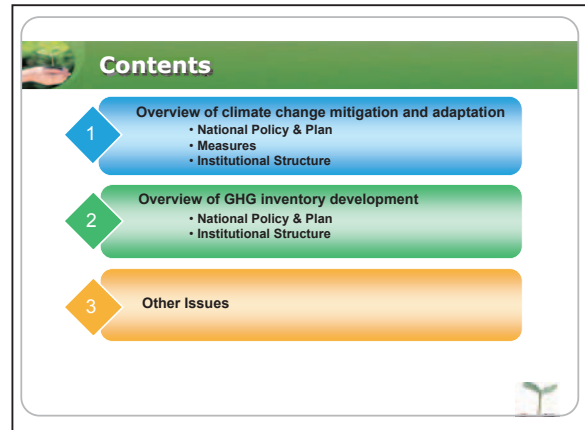
- Mobilizing more fund for research and development activities
- Strengthening Institutional cooperation and coordination
- Improving individual and government institution capacity building
- Mobilizing more financial resources to support prioritized adaptation activities and
- Increasing aid effectiveness

c. GHG Inventory

- Need strengthening cooperation, coordination, networking, information sharing among involved government institutions
- Establishing data base management systems, QA&QC
- Encourage on-the-job training practices to build local experts
- Identify possible legal instrument/tools to improve quality of GHG inventory
- Strengthening capacity of the NCCC and its Secretariat
- Resource mobilization
- Improving cooperation with regional research organizations.

d. Capacity needs and past assistance received from international donors (for example, JICA).

- Specific capacity needs: English languages skill, vulnerable assessment and adaptation modeling, cost analysis of mitigation and adaption options, cost curve development, and strategic planning development in adaptation and mitigation options. Establishing and improving national carbon accountant system, such as Measurement Reporting and Evaluation (MRV), new market mechanism, etc.
- The past assistance received:



## 1. Overview of climate change mitigation and adaptation

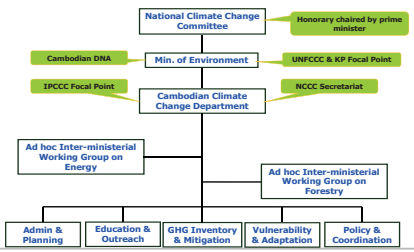
### Measure

- Cambodia recognizes important measures for adaptation, mitigation, technology transfer, financial assistance, and capacity building to address climate change. It promptly took action on national adaptation program of action, focusing on measures that have direct impacts on the livelihoods of local people, in particular the poorest, and the voluntary approaches for greenhouse gas emission reduction such as Clean Development Mechanism (CDM), REDD+, and other green growth and/or low carbon development activities.
- To reach ultimate achievement of the national programs/plans, the Royal Government of Cambodia keeps active cooperation and coordination with various development partners in term of technology transfer, capacity building, policy formulation, financial resource, etc.,

## 1. Overview of climate change mitigation and adaptation

### Institutional Structure

#### CLIMATE CHANGE MANAGEMENT STRUCTURE



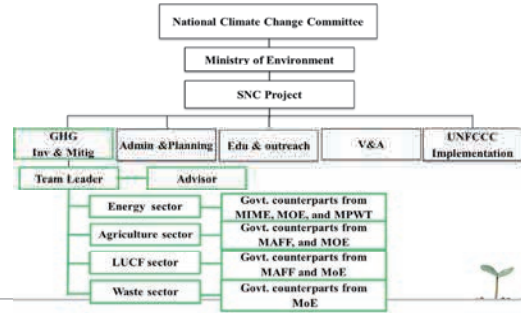
## 2. Overview of GHG Inventory Development

### National Policy and Plan

- The mandate of national greenhouse gas inventory is set in the sub-decree of the establishment of the National Climate Change Committee
- In the future national communication preparation, the GHG Inventory office plans to apply ALU (Agriculture and land use change) software and UNFCCC inventory software for preparing and reporting greenhouse gas inventory
- The office planned to engage broader participation with high responsibility from various key stakeholders including governmental ministries, universities in specific sector inventory activities
- Other carbon accounting systems including MRV and country verification emission reduction (VER), new market mechanisms, are under consideration and discussion.

## 2. Overview of GHG Inventory Development

### Institutional Structure



**3. Other issues**


❖ **Barriers with adaptation and Mitigation**

- Insufficient of individual and institution capacity
- Institutional cooperation and coordination are considerably insufficient
- Limited of financial resources
- Lack of national and sectoral policy, goal and target

❖ **Barriers with GHG Inventory**

Additional barriers to GHG Inventory:

- Insufficient activity data and emission factors
- Lack of sustainable data management system
- Limited human resources(project-based)



**3. Other issues**

❖ **Some suggestion to remove barriers**

**Improving individual and institution capacity through:**


- Strengthening institutional cooperation and coordination among stakeholder
- Mobilizing financial resources
- Mainstreaming climate change concept, knowledge including green growth and other low carbon initiatives into government institutions/agencies, private sector, NGOs, civil society organization, local communities
- Keep improving data base management systems, QA&QC
- Encourage on-the-job training practices to build capacity of local experts
- Improving cooperation with regional research organizations
- Extending research and development activities.



**3. Other issues**

❖ **Specific capacity needs:**

- Vulnerable assessment and adaptation modeling,
- Cost analysis of mitigation and adaption options including cost curve development, and
- Strategic planning development in adaptation and mitigation options
- Establishing and improving national carbon accountant system, such as Measurement Reporting and Evaluation (MRV) and new market mechanism, etc.
- More research and development activities
- English languages skill




**Thank You !**

**Contact Information**

Tel/Fax: 855 (0)23 218370  
 Email: [cceap@online.com.kh](mailto:cceap@online.com.kh)  
 Website: [www.camclimate.org.kh](http://www.camclimate.org.kh)



## The Project for "Capacity Development on Mitigation/Adaptation to Climate Change in the Southeast Asia Region"

# Climate Change International Training Center (CITC)

Thailand Greenhouse Gas Management Organization  
(Public Organization)

30 July 2012



## Agenda

1

Introduction to TGO

2

The Project for Capacity Development and Institutional Strengthening for GHG Mitigation in the Kingdom of Thailand

3

Climate Change International Training Center (CITC)

Concept

Timeline

Conceptual Framework

Work Plan

Potential Targets

Key Organizations





## Introduction to TGO



**Ministry of Natural Resources and Environment (MONRE)**

- National Focal Point of UNFCCC & Kyoto Protocol



**Thailand Greenhouse Gas Management Organization (Public Organization): TGO**

- Established in 2007

- Designated National Authority for CDM implementation (DNA-CDM)

- Co-Secretariat Office for the National Committee on Climate Change

- Technical Supporting Agency for Climate Change Mitigation



3



## Introduction to TGO

- **TGO's Vision Statement** on 'Moving Thailand towards a Low Carbon Society Based on Sustainable Development'

- **TGO duties**

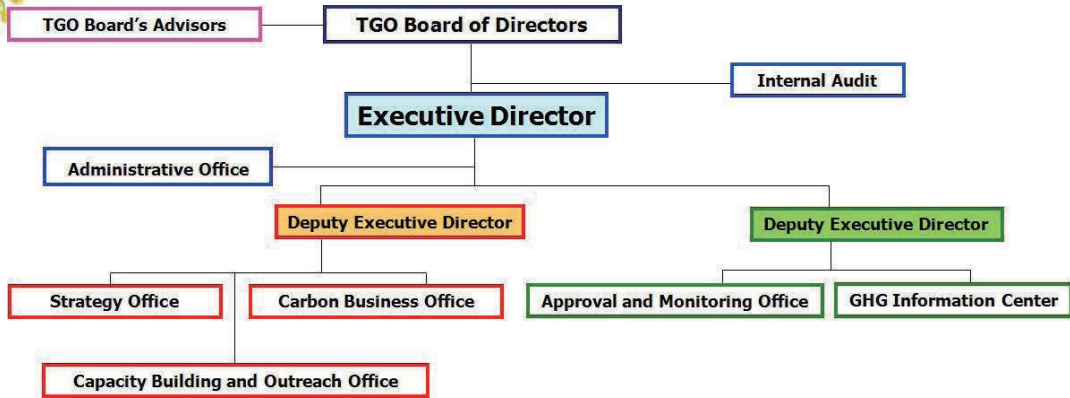
1. Analysing and screening the CDM projects for issuance of the Letter of Approval (LoA) and monitoring the projects;
2. Promoting CDM projects and the CER Market;
3. To be the National Information Clearing House of Greenhouse Gas;
4. Management of all information regarding the approved CDM projects and CERs' value;
5. Enhancing the capacity building of the government and private sectors on greenhouse gas management;
6. Promoting public outreach regarding greenhouse gases;
7. Promoting and supporting all activities related to climate change mitigation.



4



# Introduction to TGO



## TGO Organizational Structure



5



## Capacity Building and Outreach Office

1. Enhancing the capacity building of the government and private sectors on greenhouse gas management (Training, Workshop, Conference and Exhibition).



- Climate Thailand Conference (2010, 2011)



- 1<sup>st</sup> DOEs Training in Thailand

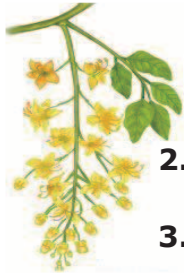


- Training workshops for all stakeholders



6





## Capacity Building and Outreach Office

2. Promoting public outreach regarding greenhouse gases.
3. Promoting and supporting all activities related to Climate Change Mitigation.



• Exhibitions, Booths



• Climate Change Channel



• Media, Materials, News



7



## Capacity Building and Outreach Office

4. Managing international cooperation projects regarding on Climate Change Mitigation.



8



## Capacity Building and Outreach Office



Barrier Removal to the Cost-Effective Development and Implementation of Energy Efficiency Standards and Labeling Project (BRESL)



Measurement & Performance Tracking in Thailand (MAPT)



Partnership for Market Readiness (PMR)



## Capacity Building and Outreach Office

### 4. Managing international cooperation projects regarding on Climate Change Mitigation.



- Capacity Development and Institutional Strengthening for GHG Mitigation in the Kingdom of Thailand





## **The Project for Capacity Development and Institutional Strengthening for GHG Mitigation in the Kingdom of Thailand**

**Purpose:** Capacity development of human resources and institutional strengthening for TGO on GHG mitigation activities

**Period:** Jan 2010 – Jan 2012

**Output 1:** Enhancement of knowledge and expertise of TGO staff and related stakeholders on GHG mitigation

*61 trainings on 6 topics: CDM, Carbon Trading*

*UNFCCC Structure and Negotiations, GHG Mitigation in relevant sectors, Carbon Footprint, GHG Inventory*

**Output 2:** Enhancement of capacity level of TGO staff on training provision

*14 training materials, 10 TGO staff participated “train the trainers”, 9 TGO staff presented at the Workshop on “GHG Mitigation and Low Carbon Society”, CTC2011*

**Output 3:** Enhancement of review and monitoring capacity of TGO staff on GHG mitigation project

*6 PINs developed, 2 draft PDDs prepared*

**Output 4:** Enhancement of capacity of TGO staff on information management on GHG mitigation

*TGO Web Site improvement, GHG inventory database development*



11



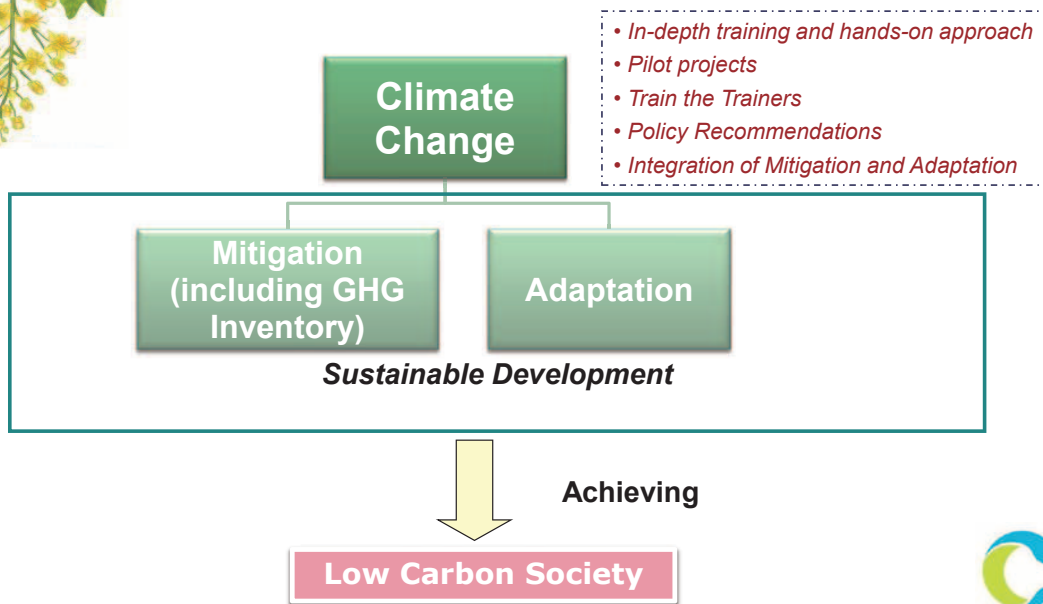
***Moving Forward from National Project on “The Project for Capacity Development and Institutional Strengthening for GHG Mitigation in the Kingdom of Thailand” to the Establishment of “CLIMATE CHANGE INTERNATIONAL TRAINING CENTER (CITC)”***



12



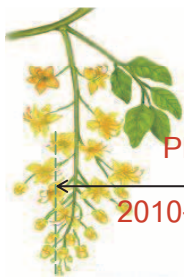
## CITC - Concept



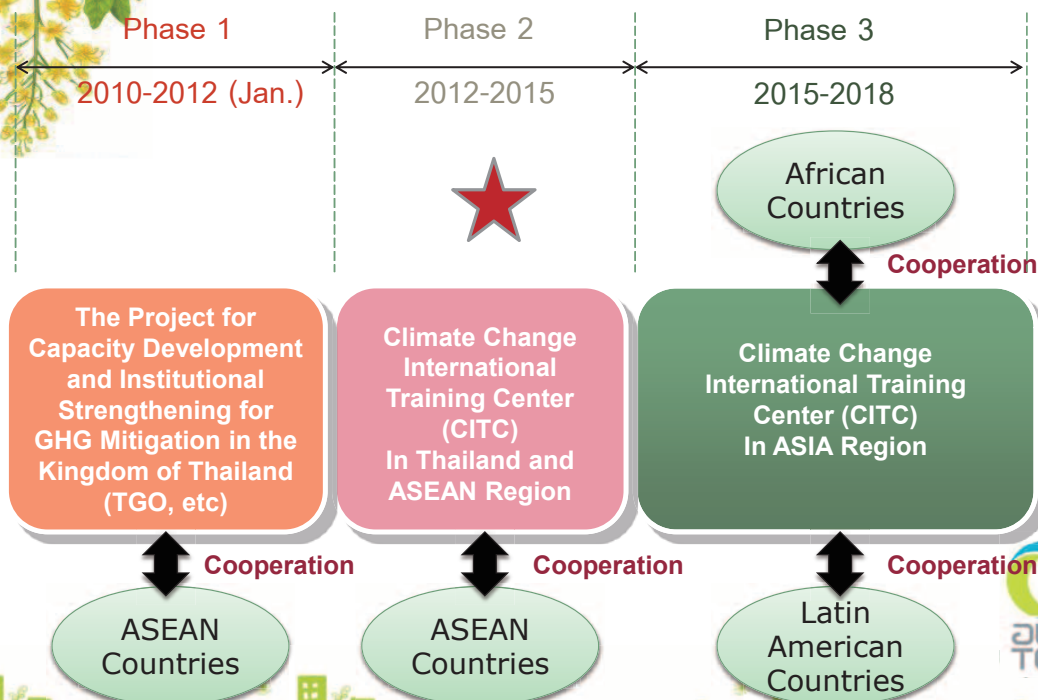
*Carbon Minimization, Simpler and Richer, Co-Existing with Nature*



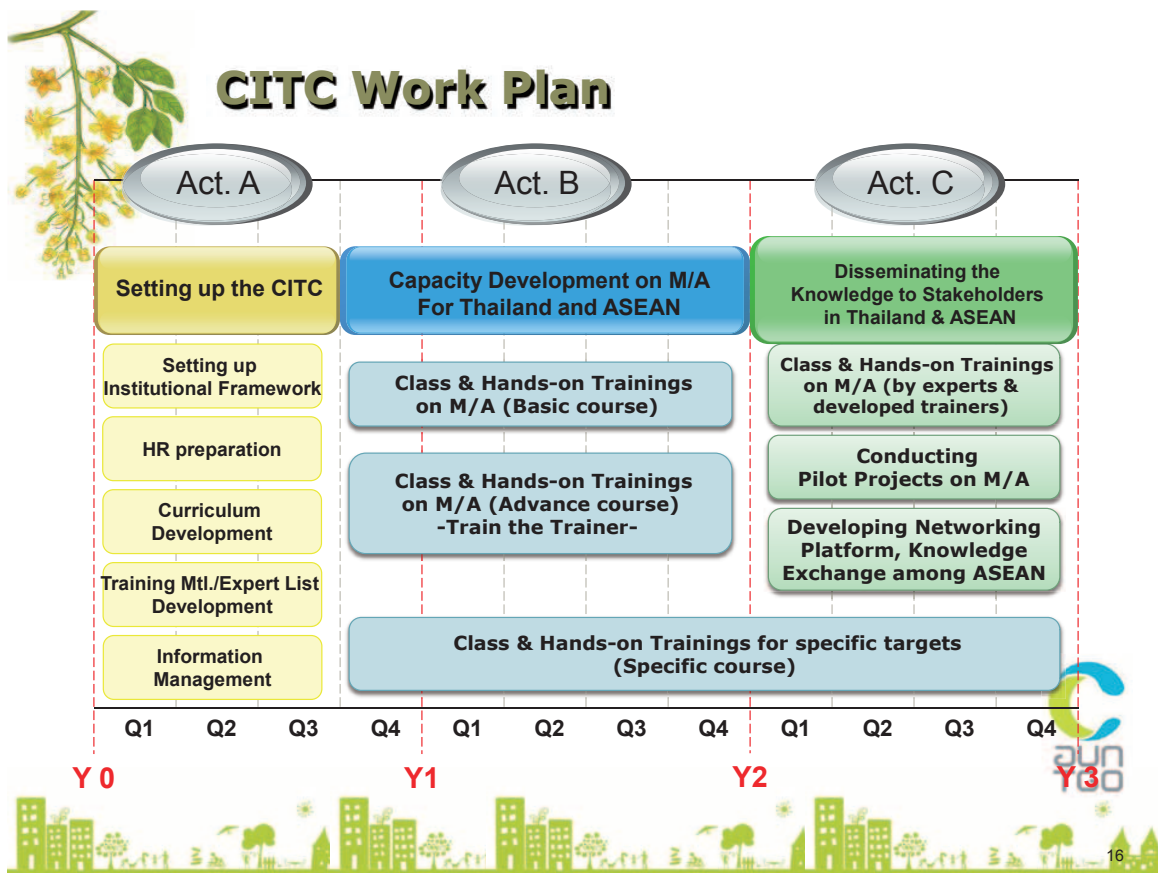
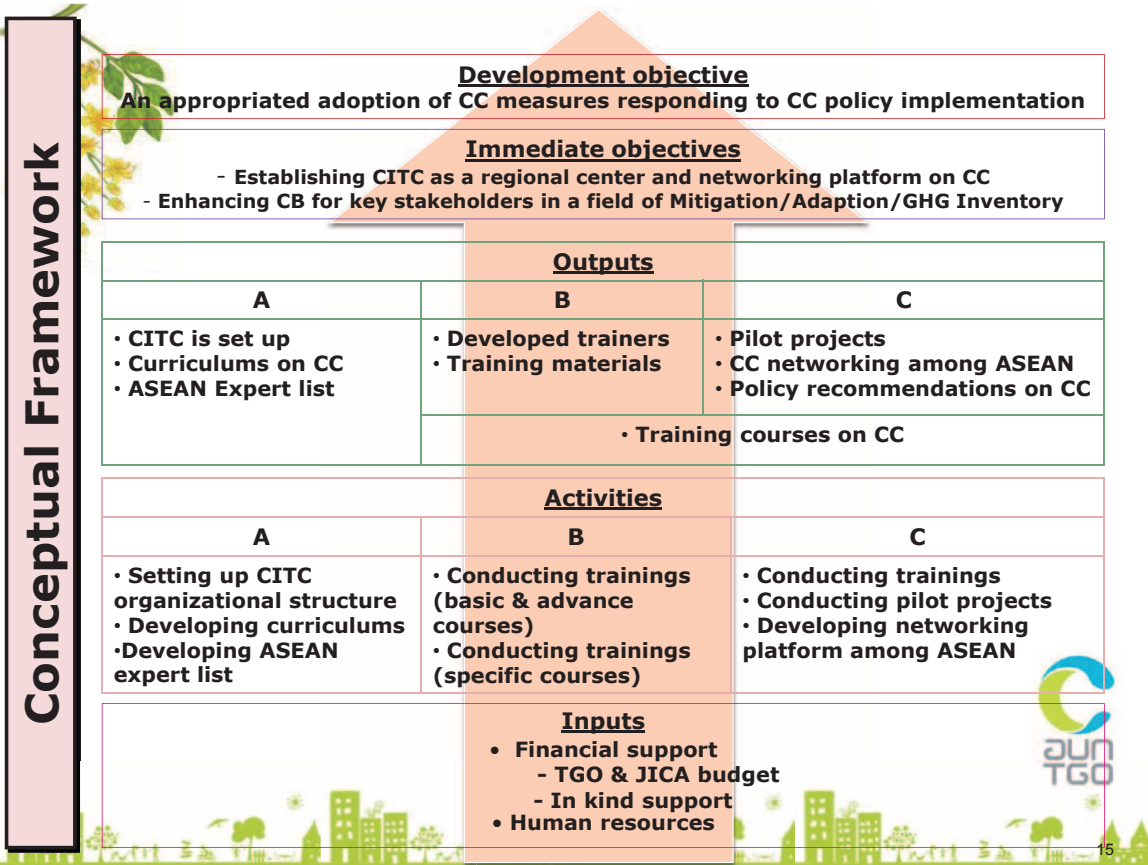
13



## CITC - Timeline



14





## CITC – Potential Targets

<b>Objectives</b>	<ul style="list-style-type: none"> <li>• To enhance the knowledge from phase I</li> </ul>	<ul style="list-style-type: none"> <li>• To develop LCS</li> </ul>
<b>Targets</b>	<ul style="list-style-type: none"> <li>• M/A related government institutions, academic institutions, private companies, general public</li> </ul>	<ul style="list-style-type: none"> <li>• Policy makers (national, local)</li> <li>• Implementers (national, local)</li> </ul>
<b>Courses</b>	<ul style="list-style-type: none"> <li>• Basic/ Advance/ Train the Trainers</li> </ul>	<ul style="list-style-type: none"> <li>• Specific</li> </ul>
<b>Outputs</b>	<ul style="list-style-type: none"> <li>• Curriculums</li> <li>• Certification</li> <li>• Trainers</li> <li>• Awareness raising activities</li> </ul>	<ul style="list-style-type: none"> <li>• Curriculums</li> <li>• Certification</li> <li>• Trainers</li> <li>• Awareness raising activities</li> <li>• LCS capacity building program, LCS guideline, and promotional scheme</li> </ul>
<b>Outcomes</b>	<ul style="list-style-type: none"> <li>• Capacity enhancement on M/A</li> <li>• Awareness raising</li> </ul>	<ul style="list-style-type: none"> <li>• Low Carbon Society implementation</li> </ul>



17



## Key Organizations & Contribution

	Finance	HR	Trainers		Curriculum Dev.		Training Facility
			M	A	M	A	
<b>TGO</b>	X	X	X		X		X
<b>JICA</b>	X	X	X	X	X	X	X
<b>ONEP</b>				X		X	
<b>ERTC/ DEQP</b>				X		X	X
<b>DEDE/MOEn</b>			X		X		X
<b>MOAC</b>				X		X	
<b>RFD</b>				X	X	X	
<b>Universities/ Institutions</b>			X	X	X	X	



18



*Thank You for you Attentions .....*

**Thailand Greenhouse Gas Management  
Organization (Public Organization) (TGO)**

**Government Complex, Bldg. B, Fl. 9,  
120 Chaengwattana Rd., Laksi,  
Bangkok 10210 THAILAND  
Tel. +662 141 9790  
Fax. +662 143 8400-5  
E-mail: [info@tgo.or.th](mailto:info@tgo.or.th)  
URL: [www.tgo.or.th](http://www.tgo.or.th)**

