Part III: NATIONAL REPORTING GUIDELINES FOR CSD-14/15 THEMATIC AREAS

A. ATMOSPHERE/AIR POLLUTION

1. ATMOSPHERE

1.1 Climate Change

Government focal point (s): Ministry of Natural Resources and Environment
Responding ministry/office(s): Ministry of Natural Resources and Environment

Decision-making: Strategies, policies, programmes and plans, legislation, policy instruments and the regulatory framework; involvement of major groups.

Thailand ratified UNFCCC in December 1994. As a party to the Convention, Thailand has complied with her commitments under the Convention and will continue to do so.

Thailand's sustainable development are guided by the national integrated development strategies. To ensure the wise use of natural resources and environment, Thailand developed natural resources conservation and environmental quality enhancement policies and plans, along with the country social and economic development plans.

To effectively address climate change, the National Environmental Board, chaired by the Prime Minister, has established the National Climate Change sub-committee, chaired by Minister of Natural Resources and Environment, to oversee the climate change issues in a holistic manner. The members of the sub-committee comprised of related public agencies, private sector and non-governmental organizations.

As stipulated in Thailand's Initial National Communication to the Convention, Thailand addresses climate change by win-win policies. Under the policies, Thailand aggressively implemented various socio-economic development policies and measures contributing to greenhouse gas reduction. Thailand has used economic and regular instruments to enhance energy conservation of the country. In particular, large industrial and business energy consumers are required to perform energy audit to enhance energy saving.

Both demand-side and supply-side management in energy sector have been emphasized. Various fiscal and financial incentive schemes have been provided to enhance energy efficiency and development of renewable energy. Public campaigns to conserve energy are regularly conducted. For instance, A "double divided for power saving" campaign in 2001 reduced residential consumption of power in the same year by more than 3057 Kwh

Protection of conserved forests and expansion of forest areas have also contributed substantially to greenhouse gas mitigation. Studies on greenhouse gas inventory in Thailand during 1994-1998 showed that forest sector increased its sink capacity and resulted in a reduction of net emission. Thailand will continue to pursue its efforts to conserve the forest resources.

Public participation is vital to the achievement of public policies and plans. Public sector has actively participated in climate change issues at policy and implementation levels. Private sector, NGOs and academic institutes play active roles in formulating climate change policies of Thailand. Education and public awareness are regularly promoted while communities are promoted to conserve energy and natural resources through decentralization of natural resources and environmental management process.

The potential climate change impacts is a great concern of Thailand. The potential vulnerability to climate change of the tropical region stimulates the need for a comprehensive and careful adaptation plans and actions. Studies on vulnerability and adaptation to climate change in Thailand have just been started. More research work in this area is urgently needed.

Capacity building, information, research and development

The highly complex issues of climate change require active participation of researchers, specialists and experts in various fields, including inventory, mitigation, vulnerability and adaptation. The national focal point in climate change plays major role in coordinating with other relevant organizations and institutes in capacity building as well as research and development process.

Capacity building on climate change in Thailand is implemented at national and international level. Capacity building is a two-way process. At national level, academic institutes play an important role in climate change capacity building in Thailand. Research and development in inventory, mitigation and vulnerability and adaptation have been implemented since the country ratified the Convention. Information on basic and technical knowledge on climate change has also been disseminated through publication and internet.

Thailand has actively involved in international research and development on climate change by encouraging the national experts and specialists to participate in R&D with international organizations such as IPCC, UNDP and UNEP. Thailand also promotes technical cooperation in climate change with countries in Indochina and ASEAN regions.

Financing

Financing climate change comes from various sources. Through the Convention, Technical and financial supports have been given to Thailand in preparing the national communication to the Convention and maintaining the national capacity. Supports to enhance national capacity also come from bilateral and multilateral cooperation such as the US Country Study Program, ADB's ALGAS project and World Bank National CDM Strategy Study.

National budget also contributes substantially to the climate change actions in Thailand. Through national budget, research and development, information dissemination and public awareness in climate change have been conducted. Thailand has just completed the framework of action plan to address education, training and public awareness under the Convention (Article 6 of the Convention).

Despite the domestic and international supports, there is still a wide range of issues on climate change that need to be addressed. Technical and financial supports for technology transfer and capacity building on environmentally sound technologies are vital for Thailand

to pursue its efforts to address climate change. International cooperation, especially from developed countries is highly important to this process.

Cooperation

International cooperation is one of the key principles of the Convention. Since her ratification of the Convention, Thailand has strongly participated in international cooperation in climate change process.

On technical aspects, Thai experts have actively participated in technical report preparation and review as well as research work of the UNFCCC, IPCC, UNDP,UNIDO and UNEP etc. National capacity has been enhanced through bilateral and multilateral cooperation, especially in the areas of inventory, mitigation and vulnerability and adaptation (see above). Thailand also exchanges experiences in climate change with other countries in the Asia region, particularly in ASEAN sub-region.

Thailand is also at the forefront of promoting regional cooperation in climate change. While short-term technical supports and exchanges are regularly carried out among ASEAN countries, Thailand also provide technical supports to countries in Indochina in higher education and training in natural resources and environmental management.

On cooperation in information exchange, Thailand submitted her initial national communication to the Convention in 2000. The Country is now in the process of preparing her second national communication to the Convention.

1.2 Thailand ODS Phasing out

Government focal point (s): Ministry of Natural Resources and Environment
Responding ministry/office(s): Ministry of Industry

On July 1, 1989, Thailand, by the Department of Industrial Works (DIW) as a Focal Point, participated in the Vienna Convention and the Montreal Protocol, which entered into force on 5 October 1989, with the following objectives**:**

1. To present our responsibility and join international coordination in protecting the world's environment
2. To avoid the deficiency of ODSs which are the controlled substances under the Montreal Protocol.

   (Note: Thailand doesn't manufacture any kinds of ODSs; therefore, the country has to import such substances from the Parties to meet the domestic needs.)
3. To protect Thai products containing, or produced by, ODSs.
4. To prepare Thai industries for the phase-out of ODS in terms of acquiring technical and financial assistance from the Montreal Protocol.

To comply with the Montreal Protocol, DIW established the following measures and procedures**:**

1. Control ODSs as Hazardous Substance Schedule 3 under the Hazardous Substance Act B.E. 2535.

2. Support the use of alternatives to ODSs through taxation measure.
3. Coordinate with international agencies in transferring alternative technologies to Thailand's industrial sector.
4. Establish projects for requesting the financial and technical assistance from the Multilateral Fund through international agencies i.e. the World Bank, UNEP and forward this assistance to enterprises in each industry for converting their equipment as well as for setting up training, seminar and public awareness, *etc*.
5. Coordinate with international agencies and organizations on the implementation of the Multilateral Fund obligations with the strong focus on the country's benefits as major concerns.
6. Disseminate ODS related information to people through media and public relations.
7. Set up ODS Phaseout guidelines for industrial sectors such as those regarding the support of the use of refrigerant storage and recovery in MAC shops to minimize the release of ODS to the ozone layer, etc.

Besides such policies and regulations, DIW received funding from the Multilateral Fund through international agencies i.e. the World Bank, UNDP, UNIDO etc. to implement ODS phase-out projects in both production and service sectors. Funded project could be either individual or group, and the fund was provided in form of grant fund or confessional loan.

Grant Fund

Since 1993, there have totally been 102 ODS-related projects in Thailand with the grant funding of 38,624,342 US dollars from the Multilateral Fund. These projects are classified as follows:

- Household refrigeration and air-condition industry	22	Projects
- Aerosol spray manufacturing industry	6	Projects
- Foam manufacturing industry	59	Projects
- Solvent industry	11	Projects
- Fire Extinguishing industry	2	Projects
- Agricultural fumigation industry	2	Projects

Concessional Loan

This type of fund is provided to implement the Demonstration Project for Chiller replacement aimed at replacing conventional 24 chillers using CFC and consuming high electricity with CFC-free chillers, which consume much less electricity. The budget for the demonstration project was 4,975,000 US dollars. This project was launched in 2001 covering a project as follows:

- Household refrigerator and air-conditioner industry	1	Projects

National CFC Phaseout Plan (NCFCP)

This project is aimed at phasing out CFC-11, CFC-12, CFC-113, CFC-114, CFC-115, 1,1,1-TCA and CTC in small and medium sized enterprises that have not yet received any assistance from DIW. The total funding for the project is 14,728.626 US dollars, covering the following industries:

- Foam industry
- Solvent industry
- Aerosol Spray industry
- Refrigerator and mobile air-conditioner maintenance industry

2. AIR POLLUTION

Government focal point (s): Ministry of Natural Resources and Environment
Responding ministry/office(s): Ministry of Natural Resources and Environment

The Pollution Control Department, Ministry of Natural Resources and Environment is the agency responsible for air quality control in Thailand. The enactment of the Enhancement and Conservation of National Environmental Quality Act 1992 is the beginning of the new era in air quality management in Thailand. Air pollution is an environmental problem that can be seen clearly in large communities and in rapidly developing areas in Thailand, where industry, transportation, traffic and construction are prevalent, as well as in areas where electricity power plant is situated. Air pollutants that are the cause of major problems, and that are below standards include dust and carbonmonoxide. Dust is a serious problem especially in crowded communities with traffic congestion. Other pollutants include lead, sulfur dioxide, and nitrogen oxide. These air pollutants originate from point sources in communities, including vehicles, construction, housing, road construction and maintenance, industries and business premises. Since these pollutants have an adverse effect on human health and solving this problem requires tremendous efforts from all concerned stakeholders, the Policy and Perspective Plan for Enhancement and Conservation of National Environment Quality, 1997-2016, has then been formulated. Under the Policy and Perspective Plan, goals and implementation guidelines have been developed.

Goals

1. Air quality in pollution control zones and urban areas, particularly dust, shall be within the range of designated Ambient Air Quality Standards. In particular, dust contamination in general areas shall have an annual average of not more than 0.1 mg/m3, and dust contamination in roadside areas shall have a maximum 24-hour average concentration of not more than 0.3 mg/m3
2. Other pollutants particularly carbon monoxide in ambient air shall remain within the designated standards.
3. The concentration of air pollutants in industrial zones and general communities, particularly sulfur dioxide and nitrogen oxides, will be within the designated standards.

Policy

1. Accelerate the reduction of air pollution primarily from vehicles, industry, construction, and transportation.
2. Maintain air quality in areas whose air quality conforms to the designated standards by not allowing it to degrade below designated standards.
3. Promote and support the utilization of low emission transportation systems.
4. encourage the participation of the government, private sectors, civil society, including polluters and affected people in taking care of air quality.

Guidelines

1. Management Guidelines
   - Separate industrial zones from communities and residential areas by rigorously implementing master city plans, and prepare reports on the efficiency systems or facilities and equipment for controlling designated air pollutants emission from industries.
   - Continuously monitor, check, analyze, and construct database of the overall ambient air quality and emission of air pollutants from its sources.
   - Formulate prevention measures and prepare emergency plans for protection, mitigation, suppression or abatement of emergency situations or accident from air pollution in local areas.
   - Assign local government agencies to prepare master plans and action plans for continuous reduction of air pollution in local areas.
   - Promote collaboration among government agencies, state enterprises, and private sector to control and prevent air pollution, and also support efficient and save energy utilization.
   - Establish buffer zone around industrial estates and industrial zones in order to control and reduce air pollution conditions arising from industrial activities.
   - Control and reduce utilization of substances that are dangerous to atmospheric ozone layer.
   - Promote investment and use tax measures to promote activities or utilization of facilities and equipment that contribute significantly to the mitigation and prevention of air pollution.

2. Investment Guidelines
   - Promote and support improvement and upgrading of fuel standards to meet international standards, including promotion of ending the use of polluting fuels.
   - Support construction of efficient mass transit systems in large urban areas and between the cities; construction of rail system; and building and improving road and express way systems in order to increase surface area available to traffic.
   - Upgrade roads passing through all rural villages, and entrance-exit roads in all villages covering a distance of about 1,000 m. from entrance-exit of villages in order to sweep, vacuum and wash the roads in an effective manner.

3. Legal Guidelines
   - Formulate and improve air quality standards, both overall standards and emission standards, including designated methods to check and measure pollution, to be the same as international standards, and strictly enforce these laws against offenders.

- Establish categories of sources of air pollution discharge and odors that must be controlled, as well as formulate appropriate standards for controlling air pollution and odor from sources.
- Designate all categories and ages of vehicles to undertake annual inspections of fuel combustion discharge system, using an inspection system based on the service center model. Use the symbol "Use Forbidden Temporarily" or, "Use Forbidden Absolutely" for vehicles that cause air pollution beyond designated emission standards set forth in the Enhancement and conversation of National Environmental Quality Act of 1992.
- Formulate orders and regulations of designating standard criteria and guidelines for practice, to control construction and related activities, including the construction of paved roads that shall have a shoulder and curb.

4. Supporting Guidelines

- Support and collaborate with private sector, associations, independent groups and all categories of mass media to participate in public relations efforts and campaigns to educate and increase understanding and awareness of hazardous threats from pollutants in air, and be informed of enforcement of laws against all categories of polluters.
- Support study, research and training in technologies for control and eradication of polluted air, including improving and maintaining machinery to decrease air pollution.
- Promote the use of economic incentives as a solution to air pollution problems.

Action

At present, the government addresses air pollution problems by several means as follows:

1. Reporting the state of air quality and air pollution in 19 major cities, including Bangkok and its metropolitan areas, through various types of media such as television, radio and internet.

2. Management of air pollution from vehicles:

   a. Designating vehicular emission standard

      i. New Vehicle: Thailand emission standards are in line with European standards. EURO 1,2 and 3 entered into force in 1995, 1997 and 2005, respectively. However, EURO 3 for heavy duty diesel vehicle is expected to enter into force in 2007. Thailand has also adopted Taiwanese emission standard for motorcycle since 2001.

      ii. In-use Vehicle: Emission Standards for dark and white smoke as well as Carbonmonoxide have entered into force.

   b. Improving the quality of fuel and promoting the use of alternative fuels

i. Benzene: Vehicles in Thailand have been completely changed from using Benzene to running on unlead gasoline since 1996.

ii. Diesel: Diesel quality in Thailand has been improved by reducing the amount of sulfur contained.

iii. Alternative fuels: Thailand, in collaboration with Clean Air Initiative for Asia Cities (CAI-Asia) and United States-Asia Environmental Partnership (US-AEP), is attempting to promote the alternative fuels, particular biofuel (ethanol and biodiesel). This is in line with the government strategy on renewable energy, which sets up the target to increase the using share of biodiesel up to 3 % in 2011.

c. Improving vehicle inspection and maintenance system: A yearly inspection is required for in-use vehicles before a registered license is issued. Moreover, since 2003, it has been prescribed that the license of in-use vehicle shall be suspended provided that the emission from such vehicles is over the vehicular emission standard.

d. Enhancing the traffics system in the major cities, particularly in Bangkok area through introducing mass transit system, improving traffic light system and undertaking public campaigns for reducing the traffic load (e.g. car pool and car free day)

3. Management of air pollution from industry

a. Designating industrial emission standards, including emissions from electricity power plant, cement industry, incinerator, rice mill, gold industry, steel industry, rock quarry and crematory

b. Establishing the Continuous Emission Monitoring Network in 1996

c. Developing specific mitigation measures such as preventive measure for particulate matter and dust problem from rock quarry, mitigation measures and monitoring system of sulfur oxide emission from coal power plant, as well as economic tools such as emission trading among the proponents.

4. Management of air pollution from other sources

a. Developing controlling measures for particulate matter and dust from construction

b. Developing controlling measures for open-burning, particularly rice straw burning and forest fire

c. Designating the emission standard for volatile petroleum organic compound and manipulating the adjustment of relevant equipment

i. Oil Distribution Depot: Every oil distribution depot shall be equipped with the vapor recover unit at stage 1A. The loading lack shall be adjusted from top loading to bottom loading.

ii. Oil Road Tanker: Every road tanker shall be equipped with vapor collector at stage 1A in order to collect the volatile petroleum organic compound during loading at the oil distribution depot or at the service station. The loading lack shall be adjusted from top loading to bottom loading.

iii. Service station: The underground oil bunker at the service station in Bangkok and its metropolitan area shall be equipped with vapor collector

at stage 1A in order to collect the volatile petroleum organic compounds and discharge those compounds back to the road tanker during loading. The loading lack shall be adjusted from top loading to bottom loading. In case of the service stations located in the narrow road, they shall be equipped with vapor collector at stage 2 in order to collect the volatile petroleum organic compounds and discharge back to the underground oil bunker while in services.

5. Capacity Building and Education

Thailand Air Pollution Center of Excellence (TAPCE) was established, in collaboration with the United States Environmental Protection Agency (USEPA) for technical support and personnel development in the air pollution area with the following responsibilities:

- supporting the education and personnel development,
- building a technical network for air pollution control and prevention,
- supporting air pollution control technology research and development,
- providing recommendations on innovative technologies and,
- supporting the center for network of training institutes on air pollution and air quality management pilot projects for many studies such as those on carrying capacity and emission trades.

Thailand ODS Phase out Plan funded by the Multilateral Fund and the Global Environment Fund

(Source : Hazardous Substances Control Bureau, DIW : 2004)

- **Grant Fund**

Industry	Project	ODP tonnes	Completed Project (as of 2003)	Ongoing Project (as of 2003)	Cancelled Projects (as of 2003)	ODS Reduction (ODP Tonnes)	Approved Budget (USD)	Actually Expended (USD)
Household Refrigerator and air conditioner	22	1,335.6	21	0	1	1,339.96	15,651,723	15,432,436
Spray aerosol	6	503.9	6	0	0	503.9	1,597,313	1,597,313
Foam	59	2,296.1	57	0	2	2,296.1	11,639,266	11,480,210
Solvent	11	113.7	10	0	1	113.7	5,565,190	5,373,108
Fire extinguisher	2	504.28	0	2	0	0	988,750	389,123
Agricultural Fumigation	2	241.8	1	1	0	-	3,182,100	3,182,100
Total	102	4,987.03	95	3	4	4,253.66	38,624,342	37,454,290

Note **:** 1.2 ongoing projects

2.4 cancelled projects since enterprises can convert to the use of non-ODS equipment by themselves.

Thailand ODS Phase out Plan funded by the Multilateral Fund and the Global Environment Fund
(Source : Hazardous Substances Control Bureau, DIW : 2004)

- **Concessional Loan**

Industry	Projects	ODP Tonnes	ODS Reduction (ODP Tonnes)	Approved Budget (USD)	Actually Expended (USD)
Refrigerator Industry (Chiller)	1	20.4	38.59*	4,975,000	2,395,141.22
Total	1	20.4	38.59	4,975,000	2,395,141.22

Note : *This reduction resulted from minimizing the use of CFC in maintaining 17 Chille rs for 17 years