**ASEAN – German Technical Cooperation**

# Thai National Workshop on Clean Air for Smaller Cities

## "LOCAL SOLUTIONS WITH GLOBAL IMPACT"

**Ballroom 3, Royal Orchid Sheraton Hotel**

**Charoen Krung Soi 30, Siphya, Bangkok, Thailand**

**Thursday, 26 August 2010**

www.citiesforcleanair.org

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## I. Background Information

The tide of globalisation prompts countries in Southeast Asia to accelerate their infrastructure development as a platform for the high rate of industrialization and urbanization. The rapidly growing cities in the region, therefore, face the varied problems of environmental degradation. Hence, the problem of meeting transport demand and air quality management are the major challenges to most ASEAN countries.

Inadequate planning for transportation growth and urbanisation, combustion of fuel by industries, households and vehicles and forest fires and dust are the sources of poor air quality in urban areas. Clean air is considered a prerequisite for good quality of human life and the health of animals and plants. Pollutants pose a wide range of negative health effects. Much of the economic losses are resulted from air pollution and its impacts on human health.

The ASEAN Environment Ministers have endorsed the "Regional Environmentally Sustainable Cities Programme" (RESCP) on March 2003. They agreed to form an ASEAN Working Group on Environmentally Sustainable Cities (AWGESC). In December 2003, the framework for Environmentally Sustainable Cities in ASEAN was developed. It has the vision "Towards Environmentally Sustainable Cities in ASEAN."

In 2005, the ASEAN Environment Ministers proposed and endorsed the ASEAN initiative on Environmentally Sustainable Cities (AIESC) to replace the RESCP and serves as an overarching mechanism for ASEAN cities to pursue environmental sustainability. This initiative includes Green and Blue issues as well as the scope of Clean Air, Clean Water and Clean Land.

Smaller cities of 150,000 to 1.5 million inhabitants in ASEAN lack the capacity to generate sufficient local financial resources to attend to their problems. The "Clean Air for Smaller Cities" project was initiated to work under the framework of AIESC by the AWGESC and the German Government through the Deutsche Gesellschaft für Technische Zusammenarbeit (GTZ), to assist smaller sized cities to develop and implement a clean air plan, as those cities have a vital role to play in national development, but tend to be neglected in overall development planning and in national and international consideration.

## II. Workshop Objectives

The Thai national workshop is aimed at:

a. Synthesising air pollution issue and its potentials for climate change mitigation;
b. Informing the public of the project progress;
c. Sharing of the problems and the solutions;
d. Providing examples of good practices and;
e. Exchanging the views and experiences on air quality management from all over the world.

## III. Participants and Speakers

The workshop had the opportunity to welcome a wide range of stakeholders in clean air management from top-level government's officials, municipality authorities, national and international experts, academics, members of non-governmental organisations, private sector, representatives from industries to the media.

## IV. Proceedings

### Summary

The workshop enjoyed active participation of about 120 executive officers from national and local government, municipal politicians, relevant national agencies, international organizations and donors. The speakers and resources persons were experts in air quality control, transportation management, and land management. Dr. Supat Wangwongwatana, Director General of Pollution Control Department (PCD), gave a welcome speech and highlights of the 5th Regional Environmentally Sustainable Transport Forum. The opening addresses were delivered by H.E. Mr. Pimuk Simaroj, Vice Minister for Natural Resources and Environment, the Kingdom of Thailand, and H.E. Mr. Stefan Duppel, Deputy Head of Mission, German Embassy. Mr. Roland Haas, the Project Director, then introduced the project to the participants followed by an overview of measures of air quality management in Thailand and lessons learned by Dr. Supat and project implementation in Thailand by Dr. Wijarn Simachaya, Deputy Director General of PCD.

Chiang Mai City Mayor, Mr. Tassanai Buranupakorn, shared the city's geographical and background information, and discussed the problems it faced. He also informed the participants of the progress made under the project, and the ways forward. Mr. Suravut Cherdchai, Mayor of Nakhon Ratchasima City also briefed the meeting on the background of the city and its ongoing activities conducted under the project, and the completion of waste management plant to open by the end of the year.

A brief session for questions and answers was opened and followed by a presentation of Mr. Paul Williams, GTZ's transport consultant, on initial transport review of Chiang Mai and Nakhon Ratchasima. Dr. Wasan Jompakdee, Chairman of Chiang Mai Air Quality Advisory Council, also discussed walkability issues in the City of Chiang Mai. Another brief session for questions and answers was then allotted.

After lunch break, three international experts - Dr. Axel Friedrich, Mr. Phillip Sayeg, Dr. Rudolf Peterson - shared a panel presentation on air quality management experiences from all over the world. The session was moderated by Dr. Wijarn, PCD. The session was followed by a brief questions and answers and a "Fish Bowl" (on-stage interaction between the resource persons and the participants) under the topic of Air Pollution in Cities. The resource persons were Dr. Supat Wangwongwatana, PCD, Dr. Chula Sukmanop, Deputy Director General of Office of Transport and Traffic Policy and Planning

(OTP), and experts from Germany, namely Dr. Axel Friedrich, Dr. Rudolf Peterson, and Mr. Phillip Sayeg, an expert from Australia. The session was moderated by Ms. Walaitat Worakul.

The meeting resumed after a coffee break and the experts from Germany and Australia were invited on stage once more to discuss under the topic of Reducing Air Pollution in Our Cities. Dr. Supat then concluded the meeting highlighting steps forward followed by a supporting speech of Mr. Vijai Amaralikit from the National Municipal League of Thailand (NMT). Mr. Haas gave a final wrap-up and identified potential next steps, and thanked all the participants for their contribution to make the workshop a fruitful event.

**a. Welcome speech and highlights of the Fifth Regional EST Forum (Dr. Supat Wangwongwatana, Director General of PCD)**

Dr. Supat warmly welcomed the participants and navigated them through the project's background. He explained that the project was a co-operation between the ASEAN Secretariat and the German Federal Ministry of Economic Cooperation and Development. It was conducted by GTZ and seven countries in ASEAN – Cambodia, Indonesia, Lao PDR, Malaysia, the Philippines, Thailand, and Vietnam. It has a regional office hosted at PCD, Thailand. It supports the tasks under the ASEAN Working Group on Environmentally Sustainable Cities. The ultimate goal is to support the cities to develop a Clean Air Plan including co-benefits to climate change and its implementation. The project will last four years from January 2009 to December 2012. Two cities have been selected from each country in the first year of the project. A roadmap for clean air plan will also be developed. The road mapwill be implemented during the second and third year, and the fourth year will be the period for evaluation and dissemination of lessons learned. In Thailand, Chiang Mai and Nakhon Ratchasima (Korat) Municipalities were selected to participate in the project. He further informed that Thailand and UNCRD co-hosted *the Fifth Environmentally Sustainable Transport Forum* (EST) on 23-25 August 2010, to discuss options to promote environmentally friendly transport among 23 ASEAN cities. The Bangkok 2020 Declaration was agreed upon. He then expressed appreciation to the guests of honor and all the speakers.

**b. Opening addresses (H.E. Mr. Pimuk Simaroj and H.E. Mr. Stefan Duppel)**

The Vice Minister expressed his appreciation that the issue of clean air for smaller cities and its co-benefits with climate change was taken up by ASEAN and the Federal Republic of Germany. He said that air pollution is increasingly becoming a concern not only in Bangkok but also in smaller cities. Children and the elderly are suffering most from the bad air quality. Medical treatment and working days lost poses a substantial cost to the society. He added that the sources of pollutants are transport, industry, power plants, agricultural waste burning, construction, dust and haze from forest fires. Exhaust fumes from motor vehicles are the major source of pollution in smaller cities. He urged all concerned to take actions to solve problem as early as possible to reduce the losses. The priorities to tackle both by local cities and central government are strengthening enforcement of existing legislation, promoting the creation of responsibility and awareness of the people to

prevent pollution, improving the public participation in planning and implementation procedures, integrating the implications on traffic volumes in city development plans, and improving scientific base knowledge on air pollution control.

H.E. Mr. Duppel shared with the participants the three reasons for Germany to co-host the event. The first one was to promote the idea of clean air for smaller cities as one of the puzzles to fit together and contribute to the whole at a regional and global level to safeguard the good living of the people. Second, with the experience of the European integration, Mr. Duppel wished ASEAN to exercise the clean air project as a regional effort for countries to learn and benefit from each other. Third, he was happy to share that Germany had its own critical air pollution period about 40 years ago and that the air quality is considerably better today. Thailand can take the positive example and solve the problem at the sources by introducing better production processes, strengthening emission standards for vehicles and fuel quality regulations, improving public transport, changing land use and city development.

**c. Introduction to the project (Mr. Roland Haas, Project Director, GTZ)**

Mr. Haas emphasized the importance of air quality management and co-benefits to climate change mitigation. He explained that the project concentrates on smaller cities because they do not have sufficient resources and are left out by other donors. The project was regional and under the ASEAN Initiative on Environmentally Sustainable Cities found in 2003 and revitalized in 2005. The project's partner is the ASEAN Working Group on Sustainable Cities (Water, Soil, and Air). The project was requested by ASEAN in 2006 and started in January 2009. The objectives of the project are for small and medium sized cities to be able to develop and implement Clean Air plans in order to improve air quality. It is foreseen that at least 10 cities have a clean air plan and seven cities will have implemented the plan by the end of the project. The project's approach is for the cities to have ownership of the project, maximizing the use of national local know-how, cooperation with local universities and governments with high degree of public participation and a focus on measures which are within the scope of responsibilities of cities to implement quickly ("Low-hanging Fruits").Mr. Haas further presented that, in terms of the outputs, the project has been able to revise cities' clean air plans, facilitate public participation, support assessment and emission inventory development, implementation of the plans and their financing.

**d. Measures of Air Quality Management in Thailand and lessons learned (Dr. Supat Wangwongwatana, PCD)**

Dr. Supat presented national measures on air pollution control to reduce the pollution in all areas with specific different solution in certain local areas. The air in Thailand is much cleaner in the past 20 years. He mentioned that pollution is from stationary, mobile, and area sources, adding that the major pollutants in Thailand are the dust, the ozone, and the lead. However, the problem of lead in the air is very small due to government's policy of promoting unleaded petrol since 1992. Thailand has been committed to the international and WHO clean air standards. The country started to monitor the air quality since 1987 or even 1981. Presently, Thailand has about 55 air monitoring stations all over the country. The stations are fully automatic and the information is transmitted electronically from the use of

telephone line in the past to the recent use of GPRS and web-base. Each station costs 5-6 million baht with the maintenance cost of about 800,000 baht for each. The PCD also works with university network to measure inorganic elements in the air. Dr. Supat also emphasized that air pollution control needed systematic solution when the sources of pollution have to be known and the problems should be solved at the sources. He informed that pollution from motor vehicles was decreasing while pollution from burning has been rapidly increasing. The standards of motor vehicles in Thailand are the same as those used in Japan or in European countries. Most cars are equipped with catalytic converters to help reduce sulfur emission. In the past, the sulfur in petrol ratio was 10,000:1,000,000. It was recently reduced to 350:1,000,000 and will be 50:1,000,000 in 2012. The PCD is now vesting its efforts on pollution from burning in open areas because it is the major source of small dust particles. He also recapitulated the Bangkok Declaration 2020, agreed upon the 5$^{th}$ EST, that countries in Asia were committed to fully achieving sustainable and environmentally friendly transport system.

**e. Project implementation in Thailand (Dr. Wijarn Simachaya, Deputy Director General of PCD)**

Dr. Wijarn gave the overall insight of the project in Thailand starting from the ASEAN Working Group on Sustainable Cities (Clean Water, Clean Land, and Clean Air) and the seven participating countries with the exception of Brunei, Singapore and Myanmar. He explained that the project rendered technical assistance for practical and sustainable clean air plan to the local cities selected. The PCD has a committee chaired by the Director General to work on the project and its Division of Policy and Planning also helped to work on the plan with the local governments and all the stakeholders. The two pilot cities will be taken as examples for other cities in the country to develop their own clean air plans. The criteria for selection are city with 150,000 to 1,500,000 inhabitants and the city's experiences in dealing with air pollution, participation of civil society and the vision of local administration on clean air management. Chiang Mai was considered as a city with an existing air pollution problem, while Nakhon Ratchsima was considered a city with rapid growth and the problem is taking shape. He explained about the roadmap completed with expert's assistance. It is composed of the vision, collective goal, air quality measurement, emission inventory, law enforcement, improved municipal transport system, and total city development analysis. A Thailand national workshop was organized as a following up of the project's progress and dissemination of good practices, development of information sharing database, lessons learned, and development of air quality management curricular with regional university network.

**f. City of Chiang Mai presentation (Mr. Tassanai Buranupakorn, Mayor of Chiang Mai Municipality)**

Mr. Tassanai presented background information about the city of Chiang Mai, which is the North's economic, tourism, education, aviation center with the annual income generation of over 50,000 million baht. There were about 1.63 million people in Chiang Mai whose area is about 20,000 square kilometers. About 40 square kilometers is defined as municipality areas inhabited by about 160,000 people. The city's geographical character is mountainous. The municipality situated at the areas where the feet of the mountains meet. When the sir was polluted, ventilation was difficult and must depend on rain water to clean up the air.

The sources of air pollution in the city are the 400,000 cars and 1.3 million motorcycles, 60% of which the city hosted. Nature can absorb only about 40% of the carbon monoxide emitted from the motor vehicles and the rest was left in the air. The city is also working on burning control, green areas increase, transport and building control with the promotion of good driving practice, cycling and transfer bus services (red song-taew) for people going in and out of the city, vertical planning, fermentation of dry leaves, and conservation of big trees in municipality areas.

**g. City of Nakhon Ratchasima (Korat) presentation (Mr. Suravut Cherdchai, Mayor of Nakorn Ratchasima Municipality)**

Mr. Suravut said the air quality problem is looming for Korat if no appropriate measure is developed to deal with the rapidly growing number of cars in the city. Korat has about 20,000 square kilometers with about 175,000 populations plus about 200,000 unregistered migrants and university students. Mr. Suravut would like to see diverted traffic network outside the city, when cars going for other provinces in the North East do not have to go through the city's municipality area. Korat has three major pollution problems: the waste, the polluted water and the air. It has solved problem of the waste to some extent and will, at the end of the year, open a plant to convert organic waste into biogas and electricity. The municipality plans to be able to sell carbon credits and become the first city in the world to be able to do so. The city also treated Lumtakhong water problems beginning with the household use of the water. The city also tried to increase green areas in the municipality using spaces of many governmental agencies. He thanked PCD to have helped developing emission inventory so that the city can prioritize work in terms of green area promotion, traffic management, and public participation. The results of the implementation of the clean air plan will be clearly seen in the next 3-5 years. He also emphasized the importance of using city planning for air pollution management and development of comprehensive mass transportation network.

***h. Questions and answers***

*How does Chiang Mai manage the operation of the bus services in the city?*

**Response**: The municipality works closely with the red songtaew (converted pick-ups with red color) by arranging connection services for the people in areas where the red songtaew do not operate. The municipality also works to ensure safety, cleanliness, and quality control of all the services to meet the clean air standards.

**i. Initial Transport Review (Mr. Paul Williams and Dr. Wasan Jompakdee)**

Mr. Williams gave a short review of an initial transport study in Chiang Mai and Nakhon Ratchasima that was jointly conducted with Chiang Mai University. For the city of Chiang Mai, he informed that a feasibility study was prepared in mid 1990s for rail mass transit system and in 2007 for bus rapid transit system. Mr. Williams emphasized the importance of integrating minibus licensing and 2,000 red songtaew services into the system. There are currently about 31 licensed sontaew routes in the city. About 18 additional routes were suggested but only a few were

operated due to route unpopularity. The City Mayor also introduced in 2003 about 25 new air-conditioned minibuses (29 seats) operated in four routes. In all, as a world-class city, Chiang Mai could work more on improving the bus and songtaew services to be more reliable, meet the route demands and avoid conflict of interests between operating companies.

In Nakhon Ratchasima, Mr. Williams said that services are generally better than in Chiang Mai. There is one bus route and 19 songtaew routes that are run by different companies. However, there are parking management problems and the integration of national transport network with the local services. He explained from the international perspective that the most successful transport conditions would have to have one single authority responsible for road development and traffic management. There should be transparent policy, public transport orientation and private sector operation, encouraging competition from the right candidates rather than having to complete on the road. In this light, Nakhon Ratchasima seems to fit better with the international successful conditions than Chiang Mai. He suggested a replacement of red songtaews with air-conditioned buses in Chiang Mai or a reform of sontaews with more scheduled service managed properly by a body. Mr. Williams viewed that there should also be a fixed rate network and short-term operating subsidy, and change of attitude of the industry. In the longer term, the city could have a clear transport policy framework and consider privatization. Finally, for Nakhon Ratchasima he suggested a bus rapid transit system.

Dr. Wasan then emphasized on the importance of walking, especially in tourist cities, saying that it has a lot of benefits to health, social interests, convenience, and the economy. Dr. Wasan has conducted a walkability survey in Chiang Mai and found that 50% of the respondents did not find it convenient to walk in the city. The hurdles are difficulties in crossing the road, obstructions on the road, the size of the road (too narrow to walk on), no road, dirty walkways, and so on. The respondents were also questioned against the Global Walkability Index. Their responses were scored on a 1-5 scale (5=very good, 4=good, 3=fair, 2=bad, 1=very bad). The overall score for walkability in Chiang Mai measured by Dr. Wasan and his team was 3.45, which is a “C” grade. He called for a political commitment and public awareness to make Chiang Mai more walkable.

### *j. Questions and answers*

*What is the Korat Mayor’s view on separating toxic and non-toxic waste practiced in the pilot 16 communities?*

**Response**: The mayor said we should focus on reducing the volume of household waste from 100% to 60% when it reached the treatment plant. The waste left for final landfill treatment should be only about 8% after being converted into biogas and electricity. He emphasized that reducing waste at the source is the most sustainable way of waste treatment.

Ms. Teunjai from Khon Kaen University also raised concern about community funeral services where the corpses were not appropriately incinerated and it was a cause of air pollution. She also added about appropriate solid and biomass waste management.

**k. Experiences on air quality management from all over the world**

*Moderator: Dr. Wijarn Simachaya, PCD*

The moderator introduced the panelists and started the session with Dr. Friedrich. He discussed about success stories of air pollution control in developed countries like the USA, who have, since 1970s, already set new car emission standards to push emissions per kilometer lower. He shared that a success needed a comprehensive approach comprising clean vehicle technology, transportation and land use planning, clean fuel, and appropriate maintenance. He also emphasized the importance of public awareness, environmental zoning, and strong promotion of environmentally friendly travel modes such as restriction of polluting vehicles, improvement of public transport and the increase of bicycle infrastructure.

Mr. Sayeg later shared experiences about public transport as a major player in big city. In Korat, he said, only about 25-30% constituted public transport. A study indicated that, in Chiang Mai, people were using songtaews less as the percentage went down from 21% earlier to 9% in 2007. He suggested that private minivans could be the solution as they are affordable, available, fast and frequent. Route management should be improved and no double-parking is allowed. Public buses should be given priority like in Kunming, China, and bus stations should be of high quality. The other good practices shown by Mr. Sayeg are walkability improvement, the idea of people first, priority for cyclist and NMT, and city-wide traffic control.

Dr. Petersen finally presented on a good example for ensuring clean air in urban areas. He recapitulated that land use planning which enable people to use less cars played an important role in reducing pollution. He shared that Europe is less car-oriented than the USA, Canada, and Australia. He added that population density and mix-uses of roads support good public transport at low costs. If the density is high, we could avoid car dependency and encourage public transportation. The areas of Asian cities are smaller than areas in the USA, so they can keep sustainable mobility.

***l. Questions and answers***

*How can we convince people to use bicycles?*

**Response**: We have to make them realize that using bicycles will make the city better. People should feel that they have the ownership of the city, and cycling is for their own benefits. We should also raise awareness to separate bicycles and motor cycles. It should also come from the city administration to offer alternative means of travel.

**m. "Fish Bowl" session on air pollution in cities: Key discussions**

In this session, participants were invited to view a slide show featuring air pollution in the water, the air, the land, and the cities and its impacts on the people's daily lives.

1. Ms. Teunjai from Khon Kaen University brought up to the discussion the possibility of car sharing, that means when a car is used more hours per day by not only the owner but also by other people.
   Dr. Wijarn said that it might not be possible in Thailand's context because everyone wants to own a car and big cars are preferred over smaller cars. However, the idea of a "car pool" was much promoted in the country, and it could be revitalized.

   Dr. Petersen commented that all kinds of technical and social innovations do not substitute something different but edge on new possibilities. There could be a widened niche of car sharing in all countries including Thailand, starting from people around universities. Nowadays, on one hand cars are used for transport, on the other hand it shows the owner's personality and image. But it could be different later on.

   Dr. Chula pointed out that "car pool" and "car share" is different. The first was used among people going on the same route at the same time while the latter was used by different people going to various places at different time. About 800 cars and 1,000 motorcycles are registered each day in the country and there are far too excessive numbers to share.

   The Chiang Mai City Mayor said that it may be possible to offer shuttle public bus service to transfer people from outside the municipal areas to leave their cars outside and enter the city with the service on weekends.

   Mr. John Ernst observed that, because of the BTS, people in Bangkok drive less than they did ten years ago, adding that we could separate the use issue from the ownership issue.

2. Dr. Wijarn requested Dr. Chula to comment on problems of public transport system plan and connectivity in Thailand.

   Dr. Chula said that there are a number of public transport service operators such as the Bangkok Mass Transit Authority (public bus/van operator), BTS (sky train operator), MRT (subway operator), and State Railway of Thailand (SRT). They have different contractual conditions. It is not difficult to connect them technically, but pricing structure is difficult to manage. No one wished to absorb the ticket price cut if all services were connected.

3. *Question: Air pollution and traffic situations in Singapore are much better today than 20 years ago. Is the Singaporean example applicable in Thailand?*

   Dr. Friedrich said that political will from the leaders are the key answer.
   Mr. Ernst emphasized the importance of having one land transport authority.

4. Mr. Bunleu Namapinij from Korat Municipality raised the issue of traffic problem caused by parents sending their children to and from schools, and most good schools are in municipal areas. *How do we solve this problem?*

Dr. Peterson saw that traffic administration body should look into the problem and nothing can be solved based on a top-down approach. People should learn to turn off the engine while parking and waiting in cars.
Dr. Friedrich commented that we should start educating people from a young age about good driving practices.

Mr. Ernst proposed that school bus service should be promoted and given privileges to send signal to parents that they should switch to the school bus.

Dr. Wijarn shared that a school bus could be popular if parents were ensured of its safety and the fee is not too much. And, schools' standards should not be too different so that parents are not struggling to send children to good schools in municipality areas.

5. Somsak Sangcharoenrat, Loei City Mayor, shared the idea of reducing transport air pollution, when lorries and ships are run by diesel fuel. *Is it better to use CNG and ethanol instead of diesel? And, can a government's agency and GTZ help to solve the problem of unpleasant smoke and odor from grilled foods by community food stalls*.

   Dr. Petersen suggested that both ethanol and gasoline has pros and cons. Ethanol causes lower emissions of carbon monoxide but emits a lot more nitrogen oxide. It should not be used at a large scale. It needs safe technology and safe catalytic technique to reduce the annual exudation. Ethanol seems to be cheaper only because of government's subsidy and tax incentives.

   Dr. Friedrich recommended that Thailand adopts the EURO 5 standard.

   Dr. Wasan added that there should be a collective goal to reduce the use of motor vehicles by creating new traditions and values. For example, Chiang Mai University can start by promoting the weekends as "car-free days", when students and staff can park their cars outside and board the shuttle buses to get in the campus instead.

**n. Reducing air pollution in our cities**

To reduce air pollution, Dr. Friedrich pointed out that a city must have a plan and the elements of clean air plan comprise a clear vision of where the city wants to go and look like in 20 years, to fulfill the mobility needs and reduce undesired traffic impacts. He further shared that cities should have quality goals, for example, to meet the WHO air quality criteria, and they should be adopted by city government and city council before discussing further measures. He also emphasized that, as a foundation of air quality management, a reliable emission inventory should be established, and could be used to prepare regulations, evaluate the emission trends, model the air quality, review impacts of new pollution sources and set the fees, assure compliance and revise existing regulations.

Dr. Petersen shared that a city should find out about the problem it has, measure the air quality, look for the sources of pollution and develop an emission inventory. The vision is to protect people's health and the natural environment. The goal

should be developed within the society. Monitoring stations and network are also needed in appropriate locations – the pollution hotspots. The results of measurement have to be well-documented and compared with the standards.

Mr. Sayeg proposed practical land use planning which includes roads building, in particular, small roads that link people's homes and their destinations. He shared that there should be balance of space sharing between cars, bicycles and so on. Public transports by buses, rails, and songtaews should be well managed and given priority. He emphasized that the people needed public transport services that work as one system. However, he said, the system needed support facilities and improved access to the facilities. Mr. Sayeg added that parking control in Thailand should be conducted in more areas and more comprehensively.

To track the progress of the plan and the implementation, Mr. Haas proposed that PCD puts all the points discussed in a table, detailing the measures, the budget, the timeframe, and the responsible persons.

### o. Conclusions and next steps

Dr. Supat emphasized that clean air management must be conducted systematically and it was an enduring effort, when measures taken today will only bear fruit in the next 3-4 years. The PCD Director General shared that, in Thailand, the past decades were the period of making amends, and prevention and mitigation have just been able to add up to recent air pollution control plan. He hoped that local authorities could help to maximize the impacts, starting from Chiang Mai and Korat as pilot cities to other cities in the country through the National Municipality League of Thailand (NMT), and finally to other countries in the region.

Mr. Vijai Amaralikit from NMT mentioned that about 149 Thai local authorities benefited a lot from the previous cooperation with GTZ about 20 years ago on green and brown agenda. Today, a number of international organizations such as GTZ, UNDP, UN HABITAT and CITYNET are assisting NMT on global warming issue. NMT will be able to disseminate the lessons learned from the Chiang Mai and Nakhon Ratchasima models nationwide through its five local learning centers in Bangkok, Chiang Rai, Songklha, Kon Kaen, Nakhon Pathom and Rayong.

Mr. Haas then proposed to meet with the mayors two or three times annually to learn about the progress they make. He wished to have another national workshop in Thailand next year, and finally extended appreciation to all the participants and the event's organizing staff.

## V. Press Release

The GTZ-PCD workshop was vigorously received by practioners, government's officials, experts in clean air management, civil society, the general public and the media. It was held as a side event of the Fifth Regional Environmentally Sustainable Transport (EST) Forum in Asia, jointly organized on 23-25 August 2010 by the Ministry of Natural Resources and environment (MONRE), the Kingdom of Thailand, the

Ministry of Environment of the Government of Japan, the United Nations Economics and Social Commission for Asia and the Pacific (ESCAP), and the United Nations Centre for Regional Development (UNCRD). The workshop attracted substantial media interest. Copies of the press release and news articles are attached.

**PRESS RELEASE**

# GTZ and Pollution Control Department Jointly Formulate Clean Air Action Plans

**Bangkok/ 26 August 2010** - German Technical Cooperation (GTZ) and ASEAN Secretariat cooperatively implement the project on Clean Air for Smaller Cities in the ASEAN Region by empowering local communities to develop municipal air quality management plans. In order to formulate a comprehensive action plan, facts on pollution control problems will be assessed in every dimension. In Thailand, GTZ jointly implement the project with the Pollution Control Department (PCD). They have selected Chiang Mai and Nakhon Ratchasima Municipalities to participate in the project.

Seven countries participate in the Clean Air for Smaller Cities in the ASEAN Region Project are Thailand, Cambodia, Indonesia, Lao PDR, Malaysia, Philippines and Vietnam. The duration of the first phase of the project, financed by the German Federal Ministry for Economic Cooperation and Development, is 4 years (2009-2012).

Mr. Roland Haas, GTZ Principal Advisor/Project Director revealed that “Objectives of the Clean Air for Smaller Cities in the ASEAN Region Project are to support and empower municipalities to develop and implement air quality management plans with participation from stakeholders and to assist in identifying both international and domestic funding sources for the implementation of the action plans. The 4 key project concepts are; i) developing the sense of ownership among participating municipalities, which is the key success factor of air quality management for its city, ii) strengthening municipalities’ knowledge by local and international technical experts, iii) promoting on public participation, and iv) implementing practical measures under the municipalitie’s control (or the “Low Hanging Fruit Approach”).

“Furthermore, capacity building to the cities’ personnel is a must. Stakeholder agencies and local universities will benefit from learning by doing with assistance from the international and PCD experts in the development of the Clean Air Plan. For long term support, the project has specially developed a training course for a variety of target groups such as Mayors, Chief Administrative, Technical Officer, media and NGOs. We aim to distribute the courses toward the training centers in the country.” added Mr. Haas.

Dr. Supat Wangwongwatana, PCD Director General said “PCD is pleased to collaborate with GTZ on the implementation of the project to improve the air quality of Chiang Mai and Nakhon Ratchasima – a crucial step that contributes to better environment and quality of life for local people. Today (26 August 2010) PCD and GTZ jointly host the first National Workshop on Development of Clean Air for Smaller Cities to present the project’s implementation progress in Thailand and to share the municipalities’ knowledge and experiences in dealing with air pollution. Workshop participants will understand key problems and appropriate approaches to develop clean and sustainable cities.”

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GTZ is a cooperation enterprise for sustainable development. It is set-up as a private company, owned by the German Federal Government. It operates on behalf of the German Federal Ministry for Economic Cooperation and Development and other German ministries, governments of partner countries and international clients (like EU, UN, World Bank, ADB) as well as private enterprises. In Thailand, GTZ has a track record of more than 30 years.

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# *Status of Thai measures to be discussed at clean air forum*

THE NATION

The Pollution Control Department (PCD), under the Natural Resources and Environment Ministry, together with German Technical Cooperation (GTZ) will be hosting the National Workshop on Clean Air for Smaller Cities on Thursday at Royal Orchid Sheraton Hotel in Bangkok.

The objective of the workshop is to present the status and progress in improving air quality in Thailand as well as to exchange experiences with other Asean countries.

The national workshop is part of the "Clean Air for Smaller Cities in the Asean Region" project implemented by GTZ and the Asean Secretariat.

The project aims at empowering smaller cities to develop and implement action plans to make their air cleaner and assess its effectiveness on pollution reduction, co-benefits and climate-change mitigation.

In Thailand, Chiang Mai and Nakhon Ratchasima have been selected to take part in the project. The selection criteria was based on population size, trends that have a high potential of affecting the environment, as well as local administration that is committed to environmental protection.

Natural Resources and Environment Minister Suwit Khunkitti is due to give the opening speech, followed by the presentation by Roland Haas, the programme adviser.

Supat Wangwongwattana, director-general of the Pollution Control Department, will present measures of air-quality management in Thailand and lessons that have been learned.

His deputy Wijarn Simachaya will highlight the framework of project implementation in Thailand and city-selection criteria, to be followed by the presentation on how Chiang Mai and Nakhon Ratchasima will participate in this project.

Following consultant Paul Williams' views on the two cities' transport opportunities, there will be a panel discussion on air-quality management measures being used in other countries. Axel Friedrich, Philip Sayeg and Rudolf Petersen, environment experts from Germany, Australia and Germany respectively, will lead the discussion.

NATION/THANAWAT SANGSEE

A MAE SAI resident wears a mask to protect herself from the thick smog that is covering the city. Many cities in the country are suffering from serious air pollution.

**Newspaper: Post Today (Thai)**, Marketing/Government

**Date:** Thursday 2 September 2010

**Circulation:** 220,000


## เมืองอากาศสะอาด

*สำนักงานความร่วมมือทางวิชาการของเยอรมนี (GTZ) ร่วมกับสำนักงานเลขาธิการอาเซียน ดำเนินโครงการปรับปรุงคุณภาพอากาศในเมืองขนาดกลางและเล็กสำหรับภูมิภาคอาเซียน สำหรับประเทศไทย GTZ ได้ดำเนินโครงการร่วมกับกรมควบคุมมลพิษ โดยคัดเลือกเทศบาลนครเชียงใหม่และนครราชสีมาเข้าร่วมโครงการ*

**Newspaper: Bangkok Post**, Outlook/Social Scene

**Date:** Thursday 9 September 2010

**Circulation:** 70,000

SOCIAL**Scene**


**Clean air:** German Technical Cooperation (GTZ) and Asean Secretariat, jointly implemented a project on 'Clean Air for Smaller Cities in the Asean Region' recently by empowering local communities to develop municipal air quality management plans. In Thailand, GTZ implemented the project with the Pollution Control Department (PCD), selecting Chiang Mai and Nakhon Ratchasima municipalities as partners. From left: Tassanai Buranupakorn, mayor of Chiang Mai City; Dr Supat Wangwongwatana, director general, Pollution Control Department; Pimuk Simaroj, vice-minister, Natural Resources and Environment; Stefan Duppel, deputy head of Mission, German Embassy; Suravut Cherdchai, mayor of Nakhon Ratchasima City; and Roland Haas, project director, GTZ.

# ANNEX 1: Thai National Workshop on Clean Air for Smaller Cities

## "LOCAL SOLUTIONS WITH GLOBAL IMPACT"

Thursday, 26 August 2010

Venue: Ballroom 3, Royal Orchid Sheraton Hotel

Charoen Krung Soi 30, Siphya, Bangkok, Thailand

**Moderator**: Mrs. Walaitat Worakul, Consultant

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|---|---|
| 8.30 – 9.00 hrs. | Registration of VIP, Participants |
| 9.00 – 9.05 hrs. | **Welcome speech and highlights of the of the 5th**<br><br>**Regional EST Forum:** *Dr. Supat Wangwongwatana, Director General, Pollution Control Department* |
| 9.05 – 9.20 hrs. | **Opening addresses**<br>• *Mr. Pimuk Simaroj, Vice Minister of Ministry of Natural Resources and Environment*<br>• *Mr. Stefan Duppel, Deputy Head of Mission, German Embassy* |
| 9.20 – 9.30 hrs. | **Introduction to the Project**<br>*Mr. Roland Haas, Project Director* |
| 9.30 – 9.50 hrs. | **Measures of Air Quality Management in Thailand and Lessons Learned:** *Dr. Supat Wangwongwatana, Director General, Pollution Control Department* |
| ***09.50 – 10:10 hrs.*** | ***Coffee Break*** |
| 10.10 – 10.30 hrs. | **Project Implementation in Thailand**<br>*Dr. Wijarn Simachaya, Deputy Director General of Pollution Control Department* |
| 10.30 – 11.10 hrs. | **Presentations of Participating Cities**<br>• **Chiang Mai** ---*Mr. Tassanai Buranupakorn, Mayor of Chiang Mai City*<br>• **Nakhon Ratchasima (Korat)** --- *Mr. Suravut Cherdchai, Mayor of Nakhon Ratchasima City* |
| 11.10 – 12.00 hrs. | **Initial Transport Review**<br>• **Findings from Chiang Mai and Korat** |

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|---|---|
| | *Mr. Paul Williams, Transport Consultant*<br>• **Chiang Mai Walkability**<br>*Dr. Wasan Jompakdee, Chairman of Chiang Mai Air Quality Advisory Council*<br>Questions and Answers |
| ***12.00 – 13.00 hrs.*** | ***LUNCH*** |
| 13.00 – 14.00 hrs. | **Experiences on air quality management from all over the world**<br>*Dr. Axel Friedrich, Mr. Phillip Sayeg, Dr. Rudolf Petersen*<br>*Moderated by Dr. Wijarn Simachaya, Deputy Director General of Pollution Control Department* |
| 14.00 – 15.15 hrs. | **Air Pollution in Cities**<br>"Fish Bowl" (on-stage interaction between the resource persons and the participants)<br>Resource persons:<br>• *Dr. Wijarn Simachaya, Deputy Director-General of Pollution Control Department.*<br>• *Dr. Chula Sukmanop, Deputy Director-General of Office of Transport and Traffic Policy and Planning (OTP)*<br>• *Dr. Axel Friedrich, Expert from Germany*<br>• *Dr. Rudolf Petersen, Expert from Germany*<br>• *Mr. Phillip Sayeg, Expert from Australia*<br>• *Mr. Roland Haas, Project Director*<br>*Moderated by Ms. Walaitat Worakul* |
| ***15.15 – 15.30 hrs.*** | ***Coffee Break*** |
| 15.30 – 16.30 hrs. | **Reducing air pollution in our cities**<br>*Dr. Axel Friedrich, Dr. Rudolf Petersen, Mr. Roland Haas,*<br>*Mr. Phillip Sayeg*<br>Questions and Answers |
| 16.30 – 17.00 hrs. | **Conclusions and Next Steps**<br>*Dr. Supat Wangwongwatana, Director General of Pollution Control Department* |

| | |
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| | **Supporting Speech**<br><br>*Mr. Vijai Amaralikit, Chairman of Sub-Committee on Environment and Public Works, The National Municipal League of Thailand* |

# ANNEX 2 Participant List

Thai National Workshop on Clean Air for Smaller Cities in the ASEAN Region

26 August 2010, Balloon 3, Royal Orchid Sheraton Hotel and Towers

| No. | Name | Position | Organization |
|---|---|---|---|
| | | **German Embassy** | |
| 1 | H.E. Stefan Duppel | Deputy Head of Mission | German Embassy |
| | | **GTZ** | |
| 2 | Mr. Roland Haas | Principal Advisor/Project Director | Clean Air Project/GTZ |
| 3 | Ms. Martina Kolb | Advisor-Regional | Clean Air Project/GTZ |
| 4 | Ms. Napaporn Yuberk | Project Manager-Regional | Clean Air Project/GTZ |
| 5 | Ms. Dudsadee Munpakdee | Project Coordinator for Thailand | Clean Air Project/GTZ |
| 6 | Ms. Chutima Kosaiyakanon | Project Office Manager | Clean Air Project/GTZ |
| 7 | Dr. Axel Friedrich | Expert | GTZ |
| 8 | Dr. Rudolf Petersen | Expert | GTZ |
| 9 | Mr. Phillip Sayeg | Expert | GTZ |
| 10 | Mr. Paul Williams | Expert | GTZ |
| 11 | Mr. Uwe Breitling | Team Leader-Regional | Port Project/GTZ |

| No. | Name | Position | Organization |
|---|---|---|---|
| 12 | Ms. Franca Sprong | Advisor-Regional | Port Project/GTZ |
| 13 | Mr. Petchada Usanapong | Deputy Director | GTZ |
| 14 | Ms. Piyathip Eawpanich | Project Manager | Climate Change Project/GTZ |
| 15 | Ms. Niranchana Authayanraksa | Junior Expert | Climate Change Project/GTZ |
| 16 | Mr. Apichai Suncindah | Advisor | Trilateral/GTZ |
| 17 | Ms. Ratchanok Suwattanabunpot | Assistant | GTZ |
| 18 | Mr. Torsten Fritsche | Project Director | Resource Efficiency/GTZ |
| 19 | Ms. Orawan Yafa | Proceeder | GTZ |
| 20 | Mr.John Ernst | Consultant | GTZ |
| 21 | Mrs. Walaitat Worakul | Moderator | Pure Natural Power |
| **Ministry of Natural Resources and Environment** | | | |
| 22 | H.E. Pimuk Simaroj | Vice Minister of Natural Resources and Environment | Ministry of Natural Resources and Environment |
| 23 | Dr. Supat Wangwongwatana | Director General | Pollution Control Department |
| 24 | Dr. Wijarn Simachaya | Deputy Director | Pollution Control Department |
| 25 | Mr. Panya Warapetcharayut | Director of automotive air pollution division | Pollution Control Department |
| 26 | Ms. Kanokwan Suksod | Environmentalist, Professional Level | Pollution Control Department |

| No. | Name | Position | Organization |
|---|---|---|---|
| 27 | Ms. Siwaporn Rungsiyanon | Environmentalist, Professional Level | Pollution Control Department |
| 28 | Ms. Piraporn Petchthong | Environmentalist, Professional Level | Pollution Control Department |
| 29 | Ms. Patcharawan Kaewka | Public Relations Officer | Pollution Control Department |
| 30 | Mr. Sanya Jongjin | Public Relations Officer | Pollution Control Department |
| 31 | Mr. Bunpot Kantasen | Director | Chiang Mai Natural Resources and Environment Office |
| **Central Government** | | | |
| 32 | Mr. Chula Sukmanop | Deputy Director-General | Office of Transport and Traffic Policy and Planning |
| 33 | Mrs. Chutithorn Praditphet | Policy and Plan Analyst | Office of Transport and Traffic Policy and Planning |
| 34 | Mr. Nopporn Jaroongkiat | Policy and Plan Analyst | Office of Transport and Traffic Policy and Planning |
| 35 | Miss Sarinporn Leemaharoungruang | Director of Air Quality and Noise Management Division | Department of Environment, BMA |
| 36 | Mrs. Nateetip Jungsomprasong | Senior Sanitation | Department of Environment, BMA |
| 37 | Ms. Jinsupat Arkhompat | Environmentalist, Professional Level | Department of Environment, BMA |
| 38 | Miss Nuanphan Phawawes | Sanitation-Technical officer | Air Quality and Noise Management division, BMA |
| 39 | Mr. Bunlaeng Narapinit | Environmentalist | Air Quality and Noise Management division, BMA |
| 40 | Mr. Woraphong Billy | Environmentalist | Air Quality and Noise Management division, BMA |
| 41 | Ms. Jarupong Pengguong | Environmentalist | Air Quality and Noise Management division, BMA |

| No. | Name | Position | Organization |
|---|---|---|---|
| 42 | Ms. Siriporn Tantivanich | Head of Vehicle Emission Control | Air Quality and Noise Management division, BMA |
| 43 | Mr. Sutaphol Thongmak | Scientist, Professional Level | Department of Land Transport |
| 44 | Ms. Chirapaporn Laima | Director of Energy Strategy Management Group | Energy Policy and Planning Office |
| 45 | Mr. Chananan Buakhiew | Expert | Energy Policy and Planning Office |
| 46 | Ms. Hathairatana Garivaj | Environmentalist, Professional Level | Environmental Research and Training Centre, Department of Environmental Quality Promotion |
| **The National Municipal league of Thailand** | | | |
| 47 | Mr. Tanongsak Thaweethong | Secretary-General | The National Municipal League of Thailand |
| 48 | Mr. Vijai Amaralikit | Mayor, Panut Nikhom Municipality | The National Municipal League of Thailand |
| 49 | Ms. Reviphak Limphodan | Director, Information and Knowledge Management Centre | The National Municipal League of Thailand |
| 50 | Mr. Worawut Sornmun | Senior Foreign Relations Coordinator | The National Municipal League of Thailand |
| 51 | Ms. Pratana Thaweethong | | The National Municipal League of Thailand |
| 52 | Mr. Kritsada Chuen-im | Representative of President of NMT | The National Municipal League of Thailand |
| **Municipality** | | | |
| 53 | Mr. Junlanop Thongsopit | Vice Mayor | Khon Kaen Municipality |
| 54 | Mr. Supatawit Tranchai | Deputy Municipal Clerk | |
| 55 | Mr. Anurak Chalumput | Sanitation Researcher | Chiangrai Municipality |

| No. | Name | Position | Organization |
|---|---|---|---|
| 56 | Mr. Pornchai Kungsanun | Director, Engineering Department | Nakhon Si Thammarat Municipality |
| 57 | Mr Veerachai Suthapong | Vice Mayor | Nakhonsawan Municipality |
| 58 | Mr. Kitti Kengkittipat | Director, Sanitary Works division | |
| 59 | Mr. Somporn Yuton | | |
| 60 | Mrs. Gunnporn Samngamnim | Director, Environmental and Health Bureau | Nontaburi Municipality |
| 61 | Mr. Jirat Phoungthong | Deputy Municipal Clerk | Ayutthaya Municipality |
| 62 | Mr. Anusorn Nuanraor | Entourage | |
| 63 | Mr. Noppadon Sinpaisansomboon | Acting Director, Sanitary Engineering Divs. | Phisaulok Municipality |
| 64 | Mr. Chuchai Lornimitdee | Sanitation Engineer | |
| 65 | Mr. Roongroje Kuapanich | Vice Mayor | Had Yai Municipality |
| 66 | Miss Karuna Thongkamnak | Deputy Municipal Clerk | |
| 67 | Mr. Somnuek Tarananon | Vice Mayor | Sumutprakarn Municipality |
| 68 | Mr. Kritpetch Puenchompoo | Sanitation Officer | Sumutprakarn Municipality |
| 69 | Miss Tharntip Junkarut | Chief, Public Health and Administrative Sub-division | Samutsakhon Municipality |
| 70 | Mrs. Suwannee Saiwutinopakul | Director, Bureau of the Public Health and Environment | Suratani Municipality |
| 71 | Mrs. Supaluk Promkeaw | Sanitation Researcher | |

| No. | Name | Position | Organization |
|---|---|---|---|
| 72 | Mr. Daoruang Hakandai | Director, Sanitation Department | Udonthani Municipality |
| 73 | Mr. Joraka Boonreang | Sanitation Officer | Ubon Ratchathani municipality |
| 74 | CPO, Kanison Satharakul | Public Health Officer | Pattaya City |
| 75 | Mr. Kiattisak Yotmundi | Assistant to Scientist | |
| 76 | Mr. Parinya Laowachirawong | Advisor to Mayor | Kampheangphet Municipality |
| 77 | Mr. Semsak Yoosukcharoen | Secretary to Mayor | |
| 78 | Mr. Somsak Seangcharoenrut | Mayor | Loei Municipality |
| 79 | Mr. Sutus Klanggumhangdetch | Deputy Municipal Clerk | Sriracha Municipality |
| 80 | Mrs. Nisakorn Wiwekwin | Sanitation Researcher | |
| 81 | Mr. Chatkul Chuensuwakul | Municipal Clerk | Lamphun Municipality |
| 82 | Mr. Tassanai Buranupakorn | Mayor | Chiang Mai Municipality |
| 83 | Ms. Rongrong Duriyapan | Chief, Air Quality and Noise Management Sub-division | |
| 84 | Ms. Patchara Mahayot | Environmental Officer | |
| 85 | Mr. Suravut Cherdchai | Mayor | Nakhon Ratchasima Municipality |
| 86 | Mr. Ponglert Supatarawanit | Vice Mayor | |
| 87 | Mr. Bunlue Narapinij | Sanitation Technical Officer | |

| No. | Name | Position | Organization |
|---|---|---|---|
| 88 | Mr. Netiwit Roengsukpipatthang | Sanitation Engineer | |
| 89 | Mr. Nadcharad Choohirunwat | Traffic Engineer | |
| 90 | Mr. Chalee Krang-im | Mayor | Trang Municipality |
| 91 | Mr. Surapol Tonsuwan | Vice Mayor | Lumphang Municipality |
| 92 | Mr. Tanawin Pimollikit | Sanitation Officer | Nakhonpathom Municipality |
| 93 | Mr. Morakot Buatang | Director, Public Health and Environment Bureau | |
| 94 | Mr. Krengsuk Chuchartpong | Director, Civil Works Division | Pruket Municipality |
| 95 | Mrs. Thippawan Petchnopparat | Chief, Public Health and Administrative Sub-division | Pakkret Municipality |
| 96 | Mr. Somsak Lapadisorn | Director, Public Works Bureau | |
| 97 | Mr. Tanit Arkarinras | Vice Mayor | Rayong Municipality |
| **International Organization** | | | |
| 98 | Mr. Joris Oele | | United Nations Economic and Social Commission for Asia and the Pacific (UNESCAP) |
| 99 | Mr. Giok Seng Lee | Executive Director | Asia Pacific Natural Gas Vehicles Association (ANGVA) |
| 100 | Ms. Sylvie Margat | Deputy Country Director | French Development Agency (AFD) |
| 101 | Ms. Pajnapa Peamsilpakulchom | Infrastructure Analyst | The World Bank |
| 102 | Mr. Choudhury Rudra Charan Mohanty | Environmental Programme Coordinator | United Nations Centre for Regional |

| No. | Name | Position | Organization |
|---|---|---|---|
| | | | Development (UNCRD) |
| 103 | Mr. Jaehyun Jang | Researcher | United Nations Centre for Regional Development (UNCRD) |
| 104 | Ms. Sayaka Iizuka | Operation Assistant | United Nations Centre for Regional Development (UNCRD) |
| 105 | Mr. Kazunobu Onogawa | Director | United Nations Centre for Regional Development (UNCRD) |
| 106 | Ms. Glynda Bathan | Policy and Partnership Manager | The Clean Air Initiative for Asian Cities (CAI-Asia) |
| 107 | Mr. Herbert Granado Fabian | Transport Program Manager | The Clean Air Initiative for Asian Cities (CAI-Asia) |
| 108 | Dr. Heathee Allen | Sustainable Development Senior Manager | The International Association of Public Transport (UITP) |
| 109 | Dr. Sutharin Koonpol | Programme Analyst Environmental Unit | The United Nations Development Programme (UNDP), Thailand |
| 110 | Dr. Salil K Sen | The Practice of Sustainability and Adjunct Assistant Professor | Muban Chombueng Rajabhat University (MCRU), Thailand |
| 111 | Najibullah Yamin | Deputy Director-General | National Environmental. Protection Agency (NEPA) |
| 112 | Mr.Tom Hamlin | Technical Advisor | the United Nations Department of Economic and Social Affairs (UNDESA) |
| **Civil Society** | | | |
| 113 | Mrs. Sawat Chattalay | Member | Air Protection Network of Chiang Mai city |
| 114 | Mrs. Nongluk Tangthai | Member | Air Protection Network of Chiang Mai city |
| 115 | Mr. Kritsada Kumphengkaew | Member | Chiang Mai Sunday Cycling Club |

| No. | Name | Position | Organization |
|---|---|---|---|
| 116 | Ms. Rukkana Srihong | Member | Kon Hug Chiang Mai Group |
| 117 | Ms.Kuankow Singhasanee | Member | Forest Restoration Research Unit, Chiang Mai University |
| 118 | Mr. Rattapong Udomsri | Traffic Inspector | Chiang Mai Police Office |
| 119 | Mr. Sadet Kewdang | Chairman of Community | Korat Ka Ri Had Thong community |
| 120 | Mr. Mongkorn  Teerasirichot | Managing Director | Invention International company |
| 121 | Mr. Kitti Netwong | Coordinator | NEC-Network company |
| 122 | Mr. Udomwit Maneewan | Receptionist | Korat City Development Institute |
| 123 | Dr. Wasan Jompakdee | Assistant Dean | Chiang Mai University |
| 124 | Dr. Khajornsak Sopajaree | Associate Professor | Chiang Mai University |
| 125 | Dr. Sirichai Koonaphapdeelert | Lecturer | Chiang Mai University |
| 126 | Dr. Somporn Chantara | Assistant Professor | Chiang Mai University |
| 127 | Dr. Juthathip Chalermphol | Researcher | Chiang Mai University |
| 128 | Mrs. Rattana Wachirodom | | The Chaipattana Foundation |
| 129 | Ms. Turgnjai Doolgindachbaporn | Assistant Professor | Khon Kaen University |

## NNEX 3: Photos


Top level participants at the opening of the workshop. (7th and 8th from left) H.E. Mr. Pimuk Simaroj, Vice Minister for Natural Resources Environment and H.E. Mr. Stefan Duppel, Deputy Head of Mission, German Embassy


A "Fish Bowl" session to exchange experiences on clean air in our cities

Attentive participants at the workshop.

Participants are from local, national and international agencies.