

Attachment 1

TECRO-AIT Technical Cooperation Program Description for 2006 and 2007

AIR QUALITY MANAGEMENT

Air Quality: Modeling, Monitoring and Forecasting

Activity 1

Title: Air Quality Modeling (Models 3) including Mercury

Implementation Format:	Technical Assistance/workshops
Reprogrammed remaining funds (NTD):	
2006 funds (NTD):	\$ 3,500,000 (NTD)
Estimated 2007 funds (NTD):	\$ 2,800,000 (NTD)

Project Description:

Result: Taiwan will have 1) increased capacity to conduct advanced modeling assessment of regional transport of air pollutants, such as O₃, PM and acid depositions from outside of Taiwan region; 2) strengthen EPAT's policy decision through the technology transfer of USEPA's integrated air quality assessment tool such as AirControlNet, and Response Surface Model (RSM) to support scientific research; 3) capacity to identify air quality episodes involving mercury by collecting and analyzing mercury field measurement data; 4) ability to conduct comprehensive mercury modeling; 5) develop a state-of-the-science mercury model within the framework of the USEPA Models-3 for the application of mercury simulation; 6) prepared for mercury emission estimates and chemical transport simulation.

Objective: This project will 1) continue air quality modeling and emissions efforts by using USEPA's Third Generation Air Quality Modeling System (Models-3)/Community Multiscale Air Quality (CMAQ) modeling system to conduct current and future air quality assessment and study the impact of transboundary and regional air pollutants transport to Taiwan; 2) develop a Taiwan policy and decision support system by integrating modeling assessment with cost benefits analysis tools such as USEPA's AirControlNet, 3) initiate modeling and emissions projects to investigate mercury issues, its impacts, and subsequently develop cost-effective mercury control strategies at Taiwan.

Activities: For the air quality modeling and decision/policy support system, USEPA will 1) continue to conduct the impacts of the transported pollutants, 2) incorporate AirControlNET with Taiwan Emission Database System (TEDS), 3) obtain results from modeling runs to RSM, 4) conduct technology workshops on the RSM tool, 5) integrate AirControlNET, and RSM in one system, Air Strategy Assessment Program, 6) conduct technology transfer workshops. For mercury modeling activities, USEPA will 1) evaluate the sciences of atmospheric mercury to be implemented in the advanced modeling system (USEPA Models-3), 2) conduct technology transfer workshops on USEPA's advanced mercury chemical transport and emission inventory modeling tools, 3) develop state-of-the-science mercury model components for implementation in USEPA's Models-3 framework, 4) perform mercury emission inventory estimates from anthropogenic and vegetative sources in Taiwan, 5) prepare model-ready emission inventory and meteorological fields required for the chemical transport simulation of mercury in Taiwan, 6) verify the model performance using available measurement and speciation data mercury, 7) perform simulations of atmospheric mercury in Taiwan to investigate the impact of the emission change due to improved mercury emission control on the ambient concentration and deposition of mercury, and 8) perform simulations to investigate of the

impact of mercury transport from other regions on the mercury deposition in Taiwan.

Time Frame: 2006–2007

Activity 2

Title: Satellite & Surface Observation of Long Range Transport of Aerosols in East Asia

Implementation Format:	Workshop
Reprogrammed remaining funds (NTD):	
2006 funds (NTD):	\$ 1,200,000 (NTD) (NASA); 800,000 (NTD) (NOAA)
Estimated 2007 funds (NTD):	\$ 900,000 (NTD) (NASA); 6,800,000 (NTD) (NOAA)

Project Description:

Results: This project will enhance the understanding of the validity of space-borne and ground-based measurements and retrievals. Better understanding of optical and radio-active properties of aerosol will help to strengthen the ability to monitor aerosol distribution in Taiwan. Significant insights will be gained regarding the evolution of aerosol chemical properties during transport and its interaction with other pollutants.

Objectives: This cooperation aims the following: 1) continue to strengthen regional capacity and capability, 2) establish Taiwan EPA's atmospheric baseline station, including the Lu-Ling Mountain Observatory [Activity 3], to meet with worldwide standards, 3) continue to collaborate with regional climate change programs for joint analyses and syntheses of measurements and model simulations. Taiwan and NASA will work closely with the international campaigns of NASA BASE-ASIS (Biomass-burning Aerosols in South East-Asia: Smoke Impact Assessment), NASA/NSF EAST-AIRE (East Asian Study of Tropospheric Aerosols – International Regional Experiment), and NOAA/UN-EP ABC (Atmospheric Brown Clouds) in the region, 4) assist EPAT's lidar and sun photometer station joint NASA MPL-Net and AeroNet, respectively, 5) improve the capability of monitoring aerosol of the baseline station in Taiwan.

Activities: Through an Interagency Agreement, NASA/Goddard Space Flight Center will combine satellite and surface observations to study the optical and radiative properties of aerosols in East Asia, and investigate regional climate and social resulting from the long-range transport of these aerosols. NASA's principal investigator will conduct workshop on passive/active remote sensing, including Terra-Aqua/Modis and micro-pulse lidar/sunphotometry. NASA will also provide personnel training and technology transfer for building up baseline station, and assist Taiwan on validation and inter-comparison of satellite-derived atmospheric products.

Through an Interagency Agreement, NOAA will transfer the following equipment in 2007: the aerosol sampling system in compliance with the specifications of the Climate Monitoring and Diagnostics Laboratory (CMDL), including Nephelometer, particle counter, 1 μ m and 10 μ m impactor, particle

soot/absorption photometer, scanning humidification/drying system and temperature/humidity sensors, pumpbox, and 10 meter stack. NOAA will help set up the aerosol sampling system in Taiwan and provide training in operation, maintenance, data collection and QA/QC.

Time Frame: 2006–2007

Activity 3

Title: Atmospheric Mercury Monitoring

Implementation Format:	Technical Assistance and Study Tour
Reprogrammed remaining funds (NTD):	
2006 funds (NTD):	\$ 650,000 (NTD); Study tour paid by EPAT
Estimated 2007 funds (NTD):	\$ 200,000 (NTD)

Project Description:

Results: EPAT will establish an atmospheric mercury monitoring station in Taiwan.

Objective: USEPA experts will assist on the construction, personnel training, data collection, and method comparison of the mercury monitoring station in Taiwan. Environmental contamination from mercury has been recognized for decades as a growing problem to humans and wildlife as it readily enters the food chain and is bio-accumulated. The most significant releases of mercury are emissions from the combustion of fossil fuels containing trace amounts of mercury with coal thought to be a major contributor. Mercury is carried around the globe through intercontinental air mass transport and appears in the environment in three forms: reactive gaseous mercury, elemental mercury, and particulate mercury.

Activities: USEPA will transfer PM sampler (dichot) to Taiwan. In addition, USEPA experts will travel to Taiwan and provide technical assistance on operational training, data collection/analysis, QA/QC control, and modeling for the new mercury monitoring station. A study tour to the US will be arranged for Taiwan officials in 2006.

Time Frame: 2006–2007

Activity 4

Title: PM Super-sites Workshop

Implementation Format:	Workshop and Equipment Purchase
Reprogrammed remaining funds (NTD):	
2006 funds (NTD):	
Estimated 2007 funds (NTD):	\$ 200,000 (NTD)

Project Description:

Results: EPAT will gain knowledge on how to operate and manage a PM super site.

Objectives: USEPA experts will share their experiences on PM super sites management, characterization of PM, data and methods comparison and testing, data analysis, QA/QC procedures, and link data to support health effects and exposure research.

Activities: USEPA and other US experts will travel to Taiwan to conduct a workshop and provide technical assistance.

Time Frame: 2007

Air Quality and Transportation

Activity 5

Title: Motor Vehicle Emissions

Implementation Format:	Workshop
Reprogrammed remaining funds (NTD):	
2006 funds (NTD):	\$ 1,500,000 (NTD)
Estimated 2007 funds (NTD):	

Project Description:

Results: Motor vehicle emission improved in urban area by experience sharing for South East Asian countries.

Objective: With the fast economic development of South East Asian countries, the air quality in urban areas has seriously deteriorated due to an increasing number of motor vehicles, especially motorcycles or mopeds. To reduce the detrimental effects of the emissions in urban areas, USEPA and EPAT will jointly hold a workshop/conference and the conference organizer will invite participants from South East Asian countries. The participants will learn: 1) both USEPA and Taiwan's experience in drafting the motor vehicle emission regulations and fuel standards, including lessons learnt and successful stories, 2) latest development of air pollution control technology, and 3) future alternatives to improve urban air pollution.

Activities: USEPA and other US experts will travel to Taiwan to jointly conduct a workshop with EPAT. Participants will be invited from South East Asian countries to attend this workshop.

Time Frame: 2006-2007

Climate Change

Activity 6

Title: eeBuildings

Implementation Format:	Workshop and Technical Assistance
Reprogrammed remaining	

funds (NTD):	
2006 funds (NTD):	\$ 1,660,000 (NTD)
Estimated 2007 funds (NTD):	\$ 1,000,000 (NTD)

Project Description:

Results: Reduce Taiwan's GHG emissions through managing energy demand by buildings.

Objectives: This activity aims at the following: 1) Work with specific building management partners to implement EE measures in their facilities, 2) Complete trainings for local technical partners in assessing and implementing no-cost and low-cost EE measures in buildings, 3) Develop case studies to showcase successful energy saving measures implemented by partners, 4) Report lessons learned and achievements through workshops or other means, 5) Recruit more partners and generate additional measurable EE results, 6) Ensure EPAT's technical capability to continue the program locally.

Activities: There will be 3 missions by a senior buildings technical advisor and 3 missions by project coordination staff to conduct training, recruit partners, investigate local technical resources and assist the development of EE implementation plans for partners, and when appropriate, document efficiency results.

Time Frame: 2006–2007

Activity 7

Title: GHG Industry-Government Partnership Program and Carbon Market Mechanism

Implementation Format:	Workshop and Technical Assistance
Reprogrammed remaining funds (NTD):	
2006 funds (NTD):	
Estimated 2007 funds (NTD):	\$ 1,000,000 (NTD)

Project Description:

Results: EPAT will gain the knowledge in GHG emission mitigation strategies, flexible mechanism

Objectives: The US has advanced voluntary programs to combat global warming. These programs help companies establish GHG emission baselines (such as California Climate Action Registry Program) and create an stable industry-government partnership (such as USEPA Climate Leaders). The participants can learn the latest development in US voluntary programs, inventory registry system, voluntary program and carbon market mechanism.

Activity: US experts will travel to Taiwan to conduct a workshop and provide assistance.

Time Frame: 2007

Activity 8

Title: Analytical Capacity Building of Greenhouse Gas Emission Mitigation and Policy Formulation under Sustainable Development

Implementation Format:	Workshop and Technical Assistance
Reprogrammed remaining funds (NTD):	
2006 funds (NTD):	
Estimated 2007 funds (NTD):	\$ 1,200,000 (NTD)

Project Description:

Results: The purpose of this project is to continue building analytical capability for EPAT for policy formulation and program implementation in GHG emission reduction.

Objectives: To assist in program evaluation and integrated policy analysis using the MARKAL model for analyzing GHG emission mitigation strategies in Taiwan. Topics and tasks of the analysis will be decided between USEPA, TEPA, Brookhaven National Laboratory (BNL), and other participating institutions in Taiwan.

Activity: Through an Interagency Agreement, DOE BNL or other experts will travel to Taiwan to conduct a workshop and provide technical assistance.

Time Frame: 2007

Indoor Air Quality

Activity 9

Title: Indoor Air Quality

Implementation Format:	Technical Assistance
Reprogrammed remaining funds (NTD):	
2006 funds (NTD):	\$ 340,000 (NTD)
Estimated 2007 funds (NTD):	\$ 1,000,000 (NTD)

Project Description:

Results: EPAT will gain: 1) a better understanding on USEPA's policies and measures to safeguard the indoor air quality (IAQ) and 2) improved capacity of policy-making.

Objective: US experts will assist EPAT to understand policies and measures taken to protect the indoor air quality. This project will focus on the following areas: analysis methods related to IAQ, IAQ control scheme in the US, locations or areas subject to IAQ control, and IAQ control programs.

Activities: USEPA experts will travel to Taiwan to conduct a workshop and provide assistance.

Time Frame: 2006–2007

SOLID AND HAZARDOUS WASTE MANAGEMENT

Activity 10

Title: Planning, Security Assessment & Constructive Technology of Closed Landfill

Implementation Format:	Workshop and study tour
Reprogrammed remaining funds (NTD):	
2006 funds (NTD):	Study tour paid by EPAT
Estimated 2007 funds (NTD):	\$ 800,000 (NTD)

Project Description:

Results: EPAT will successfully close and redevelop a landfill site

Objective: This project will strengthen EPAT's knowledge on US regulations, guidelines, and technical capabilities on the planning, assessment, re-use/redevelopment, and techniques to close landfill sites.

Activities: Approximately 3-4 EPAT officials will participate in a study tour to the US and meet with USEPA and other US experts. US experts will subsequently travel to Taiwan to host a workshop and help with the assessment, design and redevelopment of a landfill facility in Taiwan.

Time Frame: 2006-2007

Activity 11

Title: Natural Attenuation and in-situ Chemical Oxidation as Remediation for Contaminated Sites

Implementation Format:	Workshop and Technical Assistance
Reprogrammed remaining funds (NTD):	
2006 funds (NTD):	\$ 600,000 (NTD)
Estimated 2007 funds (NTD):	\$ 600,000 (NTD)

Project Description:

Results: EPAT and Taiwan scientists will have a better understanding of natural attenuation and in-situ chemical oxidation (ISCO) as remedial technologies for contaminated soil and groundwater

Objective: This project will train professionals from government offices, engineering firms, and research institutes at Taiwan on using natural attenuation and in-situ chemical oxidation to remediate contaminated sites. With respect to natural attenuation, EPAT hopes the participants will learn through case studies on (1) mechanisms of natural attenuation including non-destructive and destructive processes, (2) natural attenuation of petroleum hydrocarbons, chlorinated solvents,

inorganic contaminants, and other contaminants, (3) lines of evidence used to evaluate natural attenuation, (4) when is natural attenuation appropriate, (5) develop and implement a monitoring plan for natural attenuation, and (6) regulations of managing natural attenuation sites. With respect to in-situ chemical oxidation, EPAT hopes the participants can learn (1) mechanisms of ISCO, (2) advantages and limitations of ISCO, (3) application of ISCO to petroleum products, chlorinated solvents, pesticide compounds, (4) oxidants selections, (5) application of ISCO to cleanup pollutants in source zones and plumes, (6) remedial investigation and feasibility studies for ISCO, (7) bench-scale, pilot-scale, and full-scale design and implementation issues for ISCO (8) regulatory considerations (e.g. health, safety, permits) about ISCO, (9) Stakeholder concerns about ISCO, (10) injection design (e.g. volume, concentration, and delivery) for ISCO, (11) process and performance monitoring for ISCO, (12) post-treatment for ISCO, (13) case studies, (14) cost estimation, (15) technical references.

Activities: This activity will consist of two workshops in Taiwan in 2006 and 2007, respectively. USEPA will send experts in the area of natural attenuation and in-situ chemical oxidation to Taiwan. These two workshops will each last approximately 2 days with lectures and discussions.

Time Frame: 2006-2007

Activity 12

Title: Mercury Products Partnership

Implementation Format:	Workshop and Technical Assistance
Reprogrammed remaining funds (NTD):	
2006 funds (NTD):	\$ 1,000,000 (NTD)
Estimated 2007 funds (NTD):	

Project Description:

Results: Taiwan will reduce and/or eliminate the use and release of mercury from products

Objective: US wants to develop Mercury Product Partnership to work with Taiwan to further reduce or eliminate the use of mercury in products where there are effective substitutes, such as in batteries, measuring devices and other products. Partnership activities may involve: 1) sharing information with Taiwan on best management practices, effective non-mercury substitutes, and product specifications to facilitate the reduction or elimination of mercury in the manufacturing of specific products, such as lamps, batteries, and measuring devices, 2) introduce successful approaches, such as the USEPA Hospitals for a Healthy Environment (H2E) program, for reducing the use of mercury-containing products and the amount of mercury-containing wastes in hospitals and health care sector, 3) provide technical assistance to Taiwan on developing country-specific use inventories on how and where mercury is used in product manufacturing, 4) provide examples of assessments of barriers or impediments to use non-mercury alternatives or for reducing the amount of mercury used in manufacturing processes. The funds for this activity will be used to cover the cost of travel by US experts.

Activities: This activity will consist of a workshop lasting for 2-3 days.

Time Frame: 2006

WATER MANAGEMENT

Marine and Port Pollution Management

Activity 13

Title: Vessel Pollution Management: Investigation, Enforcement, and Emergency Response

Implementation Format:	Workshop and study tour
Reprogrammed remaining funds (NTD):	
2006 funds (NTD):	\$1,500,000 (NTD); study tour paid by EPAT
Estimated 2007 funds (NTD):	\$1,000,000 (NTD); study tour paid by EPAT

Project Description:

Results: This activity will expand Taiwan's technical capacity and understanding on vessel pollution investigation, enforcement, and emergency response. Significant insights will be gained in the US regarding the management of investigation processes of illegal discharge by vessels and emergency preparation and response from hazardous chemical and oil spills.

Objective: This project will transfer US approaches and experience on managing illegal discharge of vessels and developing effective investigative/enforcement measures to Taiwan. This includes policy and regulations on preventive actions, processes, and forensic techniques involved in the investigation phase. This activity will also demonstrate best management practices and techniques for emergency response and preparedness.

Activities: This project will be implemented through a study tour for Taiwan's officials to the US and a workshop in Taiwan with lectures and discussions for both 2006 and 2007.

Time Frame: 2006- 2007

Water Safety

Activity 14

Title: Source Water Protection: Eutrophication and Nutrient Removal

Implementation Format:	Study Tour
Reprogrammed remaining funds (NTD):	
2006 funds (NTD):	Study tour paid by EPAT
Estimated 2007 funds (NTD):	

Project Description:

Results: This project will enhance EPAT's technical capability on managing eutrophication and nutrient removal at different water bodies.

Objectives: This project aims to strengthen EPAT's knowledge on US regulations, guidelines,

engineering techniques (e.g., eco-engineering), and maintenance measures regarding eutrophication and nutrient removal.

Activities: Approximately five (5) EPAT officials will take part in a study tour to the US and meet with USEPA and other US experts.

Time Frame: 2006

ADMINISTRATION

Activity 15

Title: Annual Meeting

Implementation Format:	Study Tour
Reprogrammed remaining funds (NTD):	
2006 funds (NTD):	500,000 (NTD); Meeting travel expenses and per diem paid by EPAT
Estimated 2007 funds (NTD):	\$1,500,000 (NTD)

Project Description:

Results: EPAT and USEPA senior managers and project managers will understand the accomplishments and plans for cooperative activities and will better understand key environmental issues of common concern.

Objective: To hold a multi-day “annual conference” in 2006 and 2007 during which environmental issues of common interest are discussed and scientific papers are presented. During the conference, EPAT and USEPA officials will review the progress and accomplishments of projects that were implemented during the previous year and renew their commitment to cooperate by approving plans for the next year. In 2006, approximately ten (10) EPAT officials will visit the U.S. In 2007, USEPA officials will visit Taiwan.

Activities: Presentations, discussion groups, site visits, and review of cooperative projects.

Time Frame: 2006–2007

Activity 16

Title: USEPA/OIA Management of the Implementing Arrangement

Implementation Format:	Travel
Reprogrammed remaining funds (NTD):	
2006 funds (NTD):	\$350,000 (NTD)
Estimated 2007 funds (NTD):	\$350,000 (NTD)

Project Description

Results: US EPA Office of International Affairs (OIA) will ensure effective and timely implementation of cooperative activities.

Objective: Funds for OIA travel will enable OIA project officer to make site visits and attend in selected project activities to learn whether project goals are being met and whether scheduled activities are being implemented on time. Funds also will allow the USEPA project officer to travel to Taiwan to meet with EPAT for oversight of the Implementing Arrangement.

Activities: Travel and meetings

Time Frame: 2006–2007