ICETT

NEWS VOL.18 MAR.2010

INTERNATIONAL CENTER FOR ENVIRONMENTAL TECHNOLOGY TRANSFER

CONTENTS

Recollections of Environmental Projects at ICETT

Koshin Kura, Former Executive Director, ICETT

■ I participated in about seven projects overseas, and was perplexed each time by situations in the host countries that differed from those in Japan.

■ My first project at ICETT involved measures to improve the water quality of Laguna de Bay in the Philippines (fiscal 1997). Located south of Manila, Laguna de Bay is a so-called closed-system lake, where the development of lakeside industries such as food, textile and paper, and the concomitant deterioration of water quality, were causing fishery decline and other issues.

Although wastewater can be treated by such processes as neutralization-precipitation and activated sludge, the biggest problem for the small and midsize factories around the lake was that they could not afford the initial outlay for such equipment, or the operation cost. To begin with, their production facilities were dated, with leakages and faulty instruments often left unrepaired. It seemed somewhat unrealistic to propose rigorous wastewater treatment to factories whose main production facilities were barely working.

This survey project happened to be named "Eco-Phoenix," but first things first; one needs basic health to rise alive from the ashes. The project subsequently switched to actively promoting measures based on the idea of cleaner production.

■ From fiscal 1999 to 2000, ICETT made a successful bid for JICA's "Master Plan Study for Industrial Pollution Prevention in Vietnam," which involved conducting a survey of 100 plants across 5 industries in Vietnam, and planning plant-by-plant and nationwide wastewater management.

The majority of the plants were former state-owned facilities, with legacies of their socialist past. Rural plants had on-site kindergartens, schools and clinics, apparently run by the plants. The product cost probably included the operating cost of the kindergarten, but we were never allowed to find out the cost breakdown.

There were pulp factories discharging blackened wastewater directly into the paddy fields. I promptly proposed the wastewater treatment most common in Japan, where wastewater is gathered and incinerated in dedicated incinerators, to convert the caustic soda contained in the wastewater into sodium carbonate, which is then collected. This appeared difficult to realize unless small and midsize factories in neighboring areas were consolidated, to share the prohibitive cost.

However, that proposal was immediately rejected. According to a director at the Ministry of Industry, in Vietnam the population's stable lifestyle depended on the very fact that factories were dispersed. Since kindergartens and clinics came with the plants, integrating them could mean removing whole aspects of life, including jobs, education and medical services.

As things were, we were only able to apply simple measures to patch the problem, rather than addressing wastewater from the pulp industry in a very fundamental way.

At another factory, I was stunned to find sulfur being used as fuel. Pulp production requires sodium sulfite, but I had never heard of it being used as fuel. Naturally, flue-gas desulfurization system was non-existent, so the plant was emitting large amounts of atmospheric pollutants.

At a car battery recycling plant, untreated wastewater containing lead was being discharged into the river. After government officials told us that they avoid eating shellfish harvested in areas downstream, I could not bring myself to eat clams or other shellfish, even when offered.

Compared to other surveys, those by JICA were the most demanding in terms of scrupulousness; in most cases we worked through the night of our last day in a project country. There was a chart, for instance, that each project team member had to complete before returning to Japan; you had to fill in where you'd visited and what work you'd done every day. The chart demanded the day's weather as well. However, of the 12 or so team members, few managed to record such details every day, so we were bound to end up doing it all at once at the last minute. When the stay is as long as 40 days, it is impossible to keep track of weather or destination by memory alone. The weather on a given day was fair according to some, rainy according to others, so in the end we had to coordinate what we wrote. It was like the last-ditch effort to finish those childhood summer holiday assignments. I learned many lessons as a novice project team leader, including effective ways to write reports, coordinate seminars and deliver presentations.

■ In fiscal 1999, 2000 and 2001, ICETT responded to NEDO's public call for greenhouse gas reduction proposals, and was awarded survey grants for energy conservation proposals for a petrochemical plant, a cement plant, and a synthetic rubber plant in Thailand. Thailand uniquely uses natural gas from the Gulf of Thailand, instead of oil, as raw material. Natural gas is used as a chemical raw material, not as a fuel, so "natural gas chemical plant," rather than "petrochemical plant," is probably more accurate. At this plant, after the survey Toyo Engineering was awarded the contract to convert the power generator into a gas turbine power generator that uses methane gas. There was little progress though, toward Japan earning emissions credits through the reduction of greenhouse gases in Thailand: the Thai government at that time did not have the necessary formalities in place, and the Ministry of Natural Resources and Environment was making the irrelevant claim that Japan was trying to transfer its "dirty" industries to Thailand.

■ During 2003 and 2004, ICETT's proposal on water quality improvement in Bangkok was selected by Japan Bank for International Cooperation (JBIC) as one of its

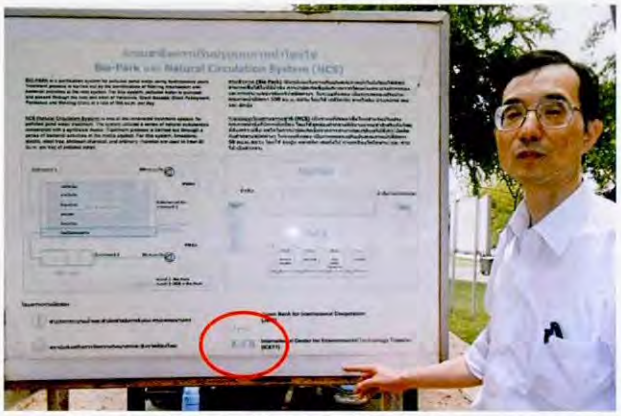
surveys for yen loan projects. ICETT's survey involved installing a model plant for use in demonstrating the water quality improvement at Lumpini Park, the oldest Western-style park in Bangkok City, and establishing a proposal for improvement based on the results of that demonstration.

We installed two types of units: a Shimanto River Method water treatment system unit, and a BIOPARK unit, which employs aquatic plants. The latter, though an uncomplicated, easy-to-install device, is capable of removing 80% of BOD, making it ideal for use by developing economies. In Japan, this type of unit is installed at Lake Kasumigaura, Lake Biwa and Lake Kibagata, as part of civic projects. The only drawback is that it has next to no effect on water quality improvement during winter months, since it uses aquatic plants. Developing countries with year-round warm weather have an advantage in this respect.

With this water purification system, the roots of aquatic plants act as netting, catching sediment as sewage passes down a gentle slope; the water-soluble elements in the sewage are absorbed by the roots. The efficiency of the purification system diminishes as the level of sewage becomes higher than the roots. At first, the Thai contractors did not understand the mechanism of the system, and made the slope steep so that the water could flow rapidly, so we had to replace the concrete. Sediments that accumulate inside the system require regular removal by stopping the supply of sewage, drying the sediments and shoveling them out. At this point our Thai counterparts started saying that they couldn't stop the supply of sewage, because doing so would kill the fish in the water, and that Buddha preached against taking lives. For some reason, allowing the shellfish to die did not seem to contradict Buddha's teachings all that much, so we proposed that they beat sticks or something to chase the fish downstream before drying out the system. In the end it was decided that the aquatic plants would be removed from the tank in their raw state, rather than after drying them and reducing their weight. I understood that Buddha's teachings did not extend to one's meals when I saw Mr. Anakorn, the Thai researcher who claimed that killing was not allowed, tucking into grilled fish at lunch.

Since the unit installed by ICETT, which is capable of processing 1,500 tons/day, proved efficient, another unit of the same type that is capable of 3,000 tons/day was demonstrated and installed next to the first by the Bangkok Metropolitan Administration (BMA), and was paid for by the Thai side. The tank of the first unit was 20 m in length, but for the second unit we proposed a type with a higher per-area BOD removal rate and reduced the tank length to 10 m, since this length proved equally effective for removing BOD. I drew the design of the second unit myself. I found it to be working fine when I revisited the site in May 2009.

There is a notice next to the unit explaining that the unit was installed with the help of ICETT and JBIC. Since the letters are beginning to fade a little from the sun, I hope that when it becomes illegible they at least retouch the part that mentions ICETT.



The author with the BIOPARK (biotope) he designed

■ In 2007 ICETT responded to a call for projects by METI. ICETT's project proposal involved conducting a survey for greenhouse gas reduction at a glass manufacturing plant in Vietnam, and earning Kyoto-Protocol-approved emissions credits through ICETT's own initiatives. We submitted a plan to the U.N. to solicit public opinion, but for better or for worse, no questions were raised from anywhere in the world. We commissioned the Japan Quality Assurance Organization (JQA) to conduct a review of the site. Unfortunately, procedures to obtain permission from the Vietnamese government did not go smoothly. Information on required paperwork was not made public. The website of the Ministry of Environment and Natural Resources demanded passwords each time I tried to access additional details. When I inquired of the officer in charge, I was introduced to the consulting firm "R," which had been established by a former government official. The proposed consulting fee for the necessary procedures was 75,000 dollars. I negotiated for a lower fee, but the deal fell through. It was pointed out that in order to reduce greenhouse gas emissions in an accurate manner, the flow meter that measures the glass manufacturing plant's fuel oil consumption required regular calibration. But the plant was reluctant to introduce means of doing so, claiming that it was not necessary for their operation. This problem remains outstanding. In Vietnam it is not customary to keep an operations log or implement manufacturing controls as rigorously as in Japan. This can be problematic for verifying consumption rate data, and requires attention when implementing CDMs (clean development mechanisms).

It was extremely rewarding to take part in these many projects. However, where language skills were concerned, I regret that there wasn't much progress excepting few points added to my English TOEIC scores. For some reason, I attained enough Thai to get by in daily life, and managed to pass the Association for Thai Language Certification, Japan level 5 Thai language proficiency test.

■ In closing, I wish to thank everyone whose help enabled me to somehow serve ICETT for 12 years. I look forward to the further growth of ICETT as an international environmental organization, as it broadens its portfolio of projects and gathers experience.

Mr. Koshin Kura retired after serving as ICETT's Executive Director for 12 years from May 1997, directing and developing the organization as well as strengthening its financial foundations. This text focuses on the overseas environmental programs he was involved in during his tenure at ICETT.

CTI presence at COP15 in Copenhagen

9 and 11 December 2009, Copenhagen, Denmark

CTI held two side events during the UN Climate Change Conference in Copenhagen (COP15). The first event entitled "Mobilizing private sector financing for mitigating climate change and promoting development using CTI PFAN" was organized with USAID and held at the US Center at the Conference and was well attended by over 60 participants; the second event was jointly organized with Energy Research Center of the Netherlands (ECN), National Renewable Energy Laboratory (NREL), and Ecologic Institute and entitled "Accelerating cooperation and financing for climate technology: Innovative programs and experiences" and was attended by over 120 participants. In both cases the participants came from a broad range of stakeholders including national delegates, private sector, international organizations, and NGO representatives. In both events, CTI presented its recent activities in particular the CTI PFAN that is successfully operating in Latin America, Africa and Asia. It was highlighted that CTI PFAN has successfully raised 75 million dollars of investment, and is currently working on over 60 projects representing over 1.7 billion dollars of required investment. The side events showcased examples of activities in a broad range of developing countries, focusing on Asia, Africa and Brazil.

During the second event, Alvaro Umaña, Costa Rica, and Elmer Holt, CTI Chair, presented the Fiorello H. La Guardia Foundation "One World Award" in recognition of work in clean technology transfer that advances sustainable agriculture. The recipients of the award were Bakir Lozane of Lozane Farms, Maputo, Mozambique, and Jose Roberto Fonseca of Instituto Eco-Engenho, Maceio, Brazil who are implementing projects with support from CTI PFAN. ECN and NREL presented a joint NREL, ECN, Risoe paper on concrete and practical options for clean energy technology cooperation under the United Nations Framework Convention on Climate Change (UNFCCC). The side event was selected by the UNFCCC secretariat for webcast which is available on-demand from the following address.

Presentation of "One World Award" by Alvaro Umaña, Costa Rica, and Elmer Holt, CTI Chair

CTI side event "Accelerating cooperation and financing for climate technology: Innovative programs and experiences"

http://www7.cop15.meta-fusion.com/kongresse/cop15/templ/play.php?id_kongressmain=1&theme=unfccc&id_kongresssession=2492

For more information, please visit the CTI website.

http://www.climatetech.net/events/index_new_detail.cfm?Page=1&EventsID=8121

CTI also held an exhibit booth where CTI Annual Report, CTI PFAN information folder, and CTI event list were distributed. It is noteworthy that the inquiries were focused around the financing support provided by CTI and CTI PFAN, which underscores the relevant nature of CTI's work. (Kuroda)

2008 International Research Promotion Project on Global Environment, subsidized by METI

Asia Forum for Clean Energy Financing

Outline

Asia Forum for Clean Energy Financing, held in Singapore on March 4, 2009, was organized by ICETT in cooperation with Climate Technology Initiative (CTI) and other organizations to provide an opportunity for clean energy project developers to find potential investors and increase fund-raising capacities. The Forum, at which 11 short-listed project proponents gave presentations on their proposals, was attended by about 120 investors and project developers.

Program Background

Financing is identified as one of the barriers to the transfer, dissemination and promotion of technologies that contribute to the mitigation and prevention of climate change. Scarcity of opportunities for project developers to meet potential investors, project developers' failure to provide adequate information for investment decisions, and project developers' failure to present project proposals that attract investor attention are some of the specific issues that must be addressed.

Program Description and Outcome

To provide an opportunity for project developers to meet potential investors, and to increase the fund-raising capacities of project developers, ICETT organized Asia Forum for Clean Energy Financing in cooperation with the following organizations:

- Climate Technology Initiative (CTI)
- PPL International (global coordinator of CTI-PFAN, or Private Financing Advisory Network)
- ReEx Capital Asia (CTI-PFAN's regional coordinator for Asia)
- USAID ECO-Asia Clean Development and Climate Program (ECO-Asia)
- Sustainable Energy Association of Singapore (SEAS)

The Forum involved the following steps:

1. Clean energy project proposals from ASEAN countries and regions were solicited and selected
2. Financial experts provided one-on-one coaching to project developers
3. Workshops were held to increase project developers' fundraising capacities
4. A Forum was held to provide an opportunity for project developers to meet potential investors

Entry was limited to projects in ASEAN countries and regions with investment amounts of one million US dollars or more. Of the 60 proposals submitted, 11 were short-listed for final consideration.

The 11 short-listed projects

Area	Country
Waste-to-engery	Indonesia
Electric vehicles	Singapore
Wind power generation	Southeast Asia
Photovoltaic/electric vehicles	Philippines
Biogas	Thailand
Biomass	Philippines
Energy efficiency	Singapore
Photovoltaic generation	Laos, Cambodia
Biofuel	Southeast Asia
Biogas	Philippines
Biogas	Cambodia, Vietnam, Indonesia

Q&A session between judges and project developers

At the Forum, developers of the 11 short-listed projects gave presentations on their proposals and made appeals for investment. In order to gain investor attention, the Forum adopted a competition format and awarded the top three project proposals for excellence. CTI is expected to provide additional one-on-one guidance on facilitating funding to these three project developers.

Several projects presented at the Forum have started negotiations with potential investors, as a result of the Forum. The Forum also demonstrated that providing one-on-one coaching on project proposal development, in addition to providing opportunities for presentations, was effective in enhancing the possibility of matching projects with investors.

Scene from the Forum

(Asano)

2008 International Research Promotion Project on the Global Environment, subsidized by METI

Greenhouse Gas Reduction Support Project in Gansu Province, China

Outline

During fiscal 2008, ICETT conducted projects to promote greenhouse gas reduction in Yunnan and Gansu Provinces in the People's Republic of China, as part of a METI-subsidized project. The purpose of these projects was to reduce greenhouse gases and help prevent global warming by improving energy efficiency. This report covers the project in Gansu Province, which concluded in March 2009.

Background

China, which is characterized by rapid economic growth in recent years, is actively engaged both domestically and internationally in efforts to reduce greenhouse gases. China's 11th 5-year plan adopts the binding goal of reducing per-unit GDP energy use by 20% before 2010. To promote energy conservation, target values have been imposed by the central government on provinces, autonomous regions and government-ruled municipalities, and by provincial governments on states and cities within provinces. Businesses are required to set energy conservation targets and sign contracts, which also cover the means of achieving those targets, with the government of their jurisdiction. Despite such active involvement by both government and industry, China has yet to reach its energy conservation goals, and is calling for further efforts.

Gansu Province(circled in red), the site of project
Gansu Province is located in the center of china. Famous cities include Dunhuang on the Silk Road, and Jiuguan, which hosts a spaceport. The project was conducted in the provincial capital Lanzhou, where the Yellow River flows.

Project Objectives and Achievements

For three years from fiscal 2005, ICETT had conducted in Gansu Province a "Human Capacity Development Project for Improvement of Productivity and Environment in China (IPEC)" as part of its "International Research Promotion Initiative on Global Environment" (reported in newsletter no. 14 and no. 15). In fiscal 2008 ICETT conducted a "Greenhouse Gas Reduction Support Project" in Gansu to reduce greenhouse gas emissions and contribute to the prevention of global warming by promoting resource and energy conservation.

Project activities included on-site diagnosis and technical assistance in cooperation with the Center for Environmentally Sound Technology Transfer (CESTT, established within the State Science and Technology Commission Administrative Centre for China's Agenda 21) and the Gansu Province Administrative Centre for Agenda 21, with guidance from Professional Engineer Shigeru Kurihara. The goal was to enable the model firm develop plans for improving energy efficiency. The activities not only contributed directly to the target firm's energy efficiency, but also indirectly contributed to the firm's human capacity building by improving the technical staff's understanding of energy conservation.

Project Activities

Lanzhou New West Vinylon Co., Ltd. was selected as the model firm because of the management's strong commitment to energy conservation. Project activities, conducted for the most part by the expert, comprised the following four steps.

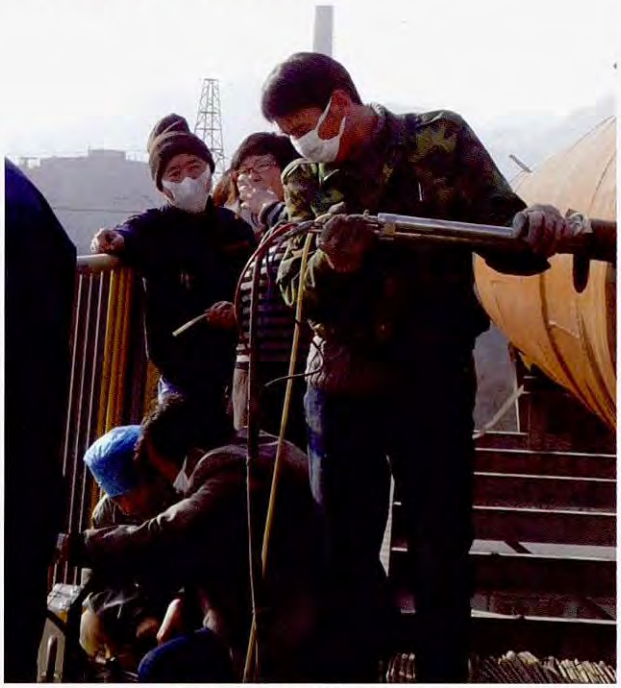
1. Preliminary survey

On-site situation and level of employee energy conservation awareness were surveyed through interviews conducted at the firm's various factories. The objective of the preliminary survey was to improve the firm's understanding of energy conservation, and to identify areas where improvement was needed to conserve energy. The survey revealed not only technical issues, but also administrative problems, such as the firm's failure to keep track of necessary data.

2. Data gathering

Data for understanding and analyzing the firm's energy use was collected and measured. Data gathering turned out

to be the most important activity for efficiently carrying out this project. The process took longer than anticipated due to unexpected problems, such as failure to locate important plan drawings and data, but the active cooperation of employees helped in the collection of necessary data. Collected data was analyzed by the expert, and the current state of energy use was clarified.



Collecting and analyzing flue gas in cooperation with the provincial government

3. Proposing improvement measures to the firm

A total of 55 specific improvement measures were proposed, with detailed energy conservation advice, based on results of on-site diagnoses and data analyses by the expert. After the proposals were presented, the expert and the firm held discussions to improve mutual understanding. The firm's employees contributed actively to this dialogue by proposing new improvement ideas, demonstrating increased energy conservation awareness among staff and management.

Discussions between the expert and company staff

4. The firm's announcement of adopted measures

After considering the economy and safety of the proposed measures, the firm selected six energy conservation projects and made a commitment to the central and provincial governments for implementation by around August 2009. As for improvement measures not selected at this point, the firm is looking to keep open the potential for discussions regarding their future implementation. After the announcement, the firm presented a banner to the ICETT delegation as a token of appreciation for the guidance provided. The inscription on the banner read, "The flower of technical assistance is in bloom; the tree of China-Japan friendship is verdant." Although the project had its problems and difficulties, this was an extremely rewarding moment.

Holding the banner: the company president with Yoichi Takaishi, Director of Global Environment Unit

■ Conclusion (Summary of the Four Years)

This project in fiscal 2008 marked the end of a series of projects ICETT conducted over a period of four years in Gansu Province, beginning with the "Human Capacity Development Project for Improvement of Productivity and Environment in China" in fiscal 2005. The personnel training project to promote cleaner production (CP) was able to produce 13 local CP experts, who are currently leading CP activities at their respective firms. The fiscal 2008 project to provide technical assistance for improving energy efficiency not only helped the target firm reach decisions regarding the implementation of improvement measures that directly translate to greenhouse gas reduction - the primary objective of this project - but also managed to enhance employee awareness and commitment regarding energy conservation to a higher degree than anticipated. Over the four years, the close cooperation of China's central and provincial governments enabled ICETT to help Gansu Province achieve growth that does not aggravate global warming. It is hoped that the knowledge, experience and results gained over those four years will spread not only within the Province but also to other regions outside the Province, and enjoy sustained growth.

(Oya and Sonobe)

2008 International Research Promotion Project on Global Environment, subsidized by METI

CTI Energy Efficiency Intervention Program in Gujarat, India

Outline

As part of a METI-subsidized program, ICETT has been conducting a "Greenhouse Gas Reduction Support Project" in India since April 2008, in cooperation with Indian authorities. In partnership with Climate Technology Initiative (CTI), this energy conservation model project seeks to reduce greenhouse gas emissions and mitigate global warming by improving the energy efficiency of rolling mill clusters in Gujarat State, west-central India.

Project Background and Objective

Global warming, which is feared to cause significant impact in a wide range of aspects worldwide, such as environmental destruction, is highlighted as a priority issue to be addressed by the global community. While nations committed to greenhouse gas (GHG) reduction targets under the Kyoto Protocol are working to reach those targets, the rapid industrialization and economic growth of developing countries and the concomitant rise in energy consumption and GHG emissions are increasingly recognized as urgent issues to be concurrently addressed.

India is one such fast-growing economy, where there have been active industry efforts to improve energy efficiency, or to develop personnel who support companies by conducting energy audits and energy diagnoses. However, such efforts have not been able to keep up with the rapid pace of economic growth, and adequate measures are lacking, especially at small and medium-sized enterprises.

In order to help India address these issues and contribute to the mitigation of global warming, this project seeks to improve energy efficiency in India's industry sectors, through the transfer and dissemination of energy conservation technologies. The project is conducted in partnership with CTI, which works to promote the transfer of greenhouse gas emission mitigation technologies.

Gujarat State (circled), India, where the project took place

Project Outline

The sector chosen to receive support through this project was the rolling mill industry clusters in Bhavnagar District, Gujarat State, west-central India.

India's industrial structure is characterized by scattered "industry clusters," geographic concentrations of small and medium-sized enterprises in the same industry category. Individual factories within such clusters typically operate with outdated facilities that are not automated like those in developed countries, making efficient energy use a salient issue.

Approximately 50 iron and steel rolling mills currently operate in Gujarat State's Bhavnagar District. Estimated per-plant coal consumption is 1,000 tons/year, and the energy reduction potential through energy conservation is estimated at approximately 20%. Ship scrap, used as raw material, is heated in furnaces and formed into products by rolling mills.

View of a rolling mill plant

Gujarat State is thought to have three industry clusters comprising about 200 rolling mills. Energy consumption at each rolling mill is not large compared to large-scale plants, but if the energy-efficiency improvement spreads to whole industry clusters within the State, some 100,000 tons equivalent of CO_2 reduction can be expected. For this project, Japanese experts in partnership with Winrock International India (WII) provided technical assistance,

including surveys on the current state of energy use at rolling mills and the identification of improvement ideas.

The following activities took place in fiscal 2008:

1. Basic survey of rolling mill clusters
2. Diagnoses of energy and environment at rolling mills
3. Study of improvement ideas based on energy diagnosis results
4. Selection of model plants for equipment improvement

Program Activities

1. Energy and environment diagnoses

Energy conservation diagnoses were conducted on four plants within the cluster in order to analyze data of current rolling mill operation. Atmospheric measurement data from around the plants were also obtained, since atmospheric pollution at and around the plants was also posing a significant problem.

Energy diagnosis at rolling mill

2. Study of improvement measures

After analyzing the data from the energy and environment diagnoses, Japanese experts and WII considered improvement measures that would enhance energy efficiency. Short-term, mid-term and long-term improvement measures were identified, and the amount of GHG reduction achievable through each measure was considered.

Data analysis and study of improvement proposal

The main improvement measures proposed for the rolling mills are shown in the table:

Examples of improvements measures

Type	Improvement proposal	GHG gas reduction (t/yr per plant)
Short-term/small investment	Install temperature measuring equipment inside heating furnace	▲190
Mid-term/ medium investment	Improve combustion facilities	▲105
	Lengthen heating furnace	▲509
Long-term/ large investment	Fully remodel heating furnace	▲982

A situation commonly seen at surveyed plants was the lack of appropriate heating furnace temperature and firing controls. A furnace is typically operated by a "fireman," who controls the temperature according to the color of the heated materials. This method is low in accuracy, and can cause uneven heating of the materials. It can also lead to energy loss through excessive heating, and waste of resources by forming a rust called "mill scale" on the surface of the overheated material.

After identifying these issues, the project explained them to the management of the four plants, and proposed specific measures to improve energy efficiency. Over the course of these discussions, plant managers came to appreciate the necessity of implementing improvements to facilities and operation in order to improve energy efficiency. From these four plants, two were chosen as model plants on the merit of their processes.

Explaining energy-efficiency improvement proposals to plant managers

Future Activities

The project is planning to implement the identified improvements in the facilities of the two model plants. Data from the improved facilities will then be collected, and the resulting energy consumption and GHG reductions will be monitored in order to quantify the effects of the improvements.

The project is also planning to hold workshops to disseminate to other rolling mills within the industry cluster the technologies involved in the model plants' energy efficiency improvements. (Shioya)

2009 JICA Group Training Program

Pollution Control and Local Environment Management

Outline

In fiscal 2009 ICETT began a series of training programs, commissioned by JICA, on the theme of pollution control, which was a key background element to the establishment of ICETT. The first training program in the series took place in 2009, with the participation of five administrative officers from China, Ghana and Tajikistan. The roughly 40-day program focused on developing proposals for addressing pollution in the regions of the participants' countries.

■ Background and Objectives

The real sources of industrial pollution in developing countries are often small and medium-sized enterprises and factories that do not have environmental management systems in place. Untreated domestic wastewater and solid wastes compound the problem, changing environmental pollution from sporadic incidents into more serious, widespread concerns. In the course of this participatory training program, pollutant emission sources in the participant countries were identified, and countermeasures were planned for administrators to adopt.

The objectives of the program were to look directly at the impact of small and mid scale, yet non-negligible pollution, that is actually happening at specific regions, to deepen one's knowledge, based on Japanese case examples, of administrative methods that lead to the planning and implementation of practical improvement measures, and to acquire such methods through a participatory approach.

■ Program Outline

The training program was conducted for about 40 days, from August 13 to September 18, 2009. Participating were 5 administrative officers from China (2 persons), Ghana (2 persons) and Tajikistan (1 person). The curriculum focused mainly on pollution control (air and water pollution), but also included aspects of domestic wastewater and solid waste management.

The program included lectures, exercises and field trips. There were also opportunities for participants to discuss and exchange views among themselves, to better understand the information gained through the program, and consider its use in the context of their respective countries.

■ Program Activities

The program comprised 4 modules: 1) Study of the current state of pollution, 2) Environmental improvement and management, 3) Local environmental management capacity development and 4) Summary (presentation of action plans).

1. Study of the current state of pollution

This module focused on studying the Japanese experience of pollution, and on developing awareness for the current state of pollution in participant countries and regions.

Lectures were designed to develop knowledge about the history of pollution in Japan, and how pollution has been addressed here. To learn about pollution-related laws and regulations in Japan, and to understand the geographical factors of Yokkaichi air pollution, participants also took part in a field trip to Isozu district, where the problem first came to light.

To reconfirm their tasks and the kinds of knowledge they must acquire, participants also gave presentations on pollution and priority areas for improvement in their respective regions.

Participants hear explanations at Isozu district

Mr. Tan giving a presentation on issues in China

2. Environmental improvement and management

In this module, participants reconfirmed the concept of voluntary environmental management by private enterprise, and analyzed factors preventing its adoption at polluting factories in their respective countries.

Lectures introduced pollution control technologies such as technologies to prevent air and water pollution, and cleaner production (CP) technologies. There were also

field trips to study wastewater treatment technologies in use at factories.

In addition, participants had the opportunity to exchange views with environmental officers of Yokkaichi City Local Environmental Council member companies, learning about pollution control measures adopted by the companies, and the importance of maintaining dialogues with local communities. The participants were also able to discuss their own issues with these officers, an experience that turned out to be very fruitful.

With members of Yokkaichi City Local Environmental Council

3. Local environmental management capacity development

Improving the local environment requires not only the engagement of the polluting factory, but also the involvement of various local stakeholders, in a way that optimizes their roles and characteristics.

This module was designed to develop understanding of voluntary environmental efforts by companies, including corporate social responsibility (CSR) and the acquisition of ISO14001 certification. By making field trips to river basins in Mie Prefecture, where local communities are involved in citizen participation projects, the participants also developed their knowledge of revitalization programs carried out by communities.

Mr. Tetty from Ghana tests the water quality at a river basin

4. Summary (Presentation of action plans)

To conclude the training program, the participants reviewed issues in their countries that must be addressed, and presented action plans proposing practical implementation methods based on knowledge and information gained from the program.

As the action plans were still in draft form, the participants returned to their home countries with the task of further reviewing and refining their plans through coordination with stakeholders.

Extracurricular Activities

On a weekend during the training period, the participants gained a taste of Japanese culture at Shisuian, a teahouse in Yokkaichi City, where they were served *matcha* (powdered green tea) and sweets in a *ryurei-style* (guests are seated in chairs) tea ceremony. They also appreciated the architecture of the teahouse and surrounding garden, enjoying the day off and their experience of Japanese tradition.

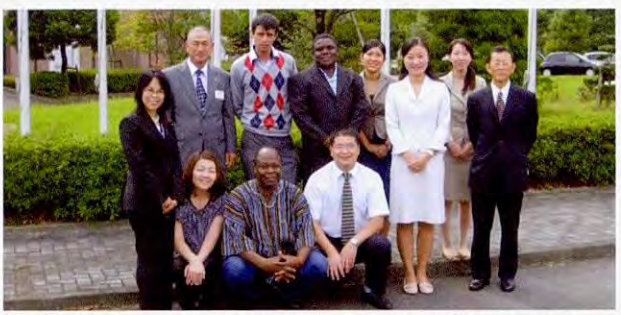
At Shisuian (teahouse)

■ Program Results

The environmental situations of participants' countries were in some ways quite disparate, but the participants listened attentively to presentations by fellow participants, learning about situations different from those in their own countries and actively sharing information, remaining highly motivated throughout the training program.

The reality presented in the film shown during the lectures regarding the damage and recovery from Yokkaichi pollution had a profound impact on the participants, who reaffirmed the importance of working toward implementing pollution control measures in their own countries.

Participants also commented that seeing the environmental efforts at the Japanese factories in actuality, and conducting water quality tests themselves, proved highly informative and impressed them with the Japan's high level of awareness about pollution prevention.



Participants and staff after the program's closing ceremony

■ Conclusion

In many developing countries, economic growth and industrialization are aggravating air and water contamination and problems of domestic waste. Such pollution, affecting human health and the ecosystem, requires urgent action, since the damage can be far-reaching.

Drawing on the lessons of Yokkaichi pollution, one of the so-called "Four Major Pollution Issues" ICETT wishes to continue providing opportunities for future training program participants to develop understanding and knowledge of the importance of taking preventive measures against pollution. We wish to close by thanking everyone who supported the program. (Tohyama)

Commissioned by Mie Prefecture

2008 International Network Building Program in Probolinggo, Indonesia

Outline

The "International Network Building Program" started in fiscal 2007. The program for fiscal 2008, conducted in Probolinggo in the Republic of Indonesia under the theme of waste management, comprised a training and networking event held on February 17, and a seminar held on February 18, 2009.

Background and Objectives

ICETT has conducted "Environmental Cooperation Program for Asia (ECPA)" since 1998. The program was commissioned by Mie Prefecture to support municipalities in Asia seeking to make environmental improvements. To date, ECPA has provided support to five municipalities in five countries through training in Japan and seminars in those countries. The "International Network Building Program" was launched in fiscal 2007 as a follow-up to ECPA. It aims to review subsequent developments in ECPA participant municipalities, and strengthen networks with local environmental leaders created by ECPA. The program for fiscal 2008 was the second of the International Network Building Program, which is scheduled for implementation in all municipalities that have completed ECPA.

Profile of Probolinggo

The city of Probolinggo, located on the north coast of East Java, has a population of 180,000. The City is conveniently located on the main artery between Indonesia's second largest city, Surabaya, and the island of Bali. Though not especially large, the City consists of 5 districts comprising 29 town councils. Headed by the mayor, the City is actively pursuing environmental efforts, and has worked on air, water and waste management under the slogan "a verdant, pollution-free city" even before the ECPA took place in Probolinggo five years ago.

The project site in Java (circled)

Program Activities

The International Network Building Program in Probolinggo, which focused on the theme of waste management, consisted of a training and networking event on February 17, and a seminar on February 18. The program was intended for Probolinggo's municipal employees, teachers, NGOs, businesses and the press, as well as East Java State municipalities. The training and networking event included visits to nine companies, schools and facilities in Probolinggo that engaged in environmental activities. The tours were accompanied by Probolinggo officials, East Java State municipal officials and Japanese experts. What impressed the delegation most was the well-developed environmental education provided at schools. Probolinggo makes it compulsory for schools to take part in Indonesia's national scheme for awarding excellence in environmental education. Consequently, environmental studies are taught at all schools in the city. The environmental information center established as result of ECPA was functioning effectively as an environmental education facility, and was already earmarked for expansion. These facts demonstrated that among the environmental measures implemented in Probolinggo by ECPA, environmental education was proving the most successful.

PET bottle recycling explanation

The seminar featured lectures and discussions by Japanese experts and local university professors on the theme "effective use and recycling of waste." Reflecting the City's very high public interest in waste disposal issues, the 197 seminar participants included not only government officials, but also people from industry and education sectors. Participants actively asked questions of lecturers and listened attentively to their advice.

A banner welcoming ICETT

Future Issues and Prospects

The program was able to confirm that among the environmental measures initiated by environmental leaders trained through ECPA five years ago, environmental education and enlightenment were highly successful. On the other hand, the Q&A sessions indicated that information and technology for environmental conservation needed further dissemination. To build on this program and further promote its government-led environmental measures, it is important that the City maintains the exchange of information and technical support with ICETT and Mie Prefecture through networks built by the present program.

(Matsuoka)

2008 JICA & JICE Scholarship Seminar on Environmental Conservation

Sustainable Development and Environment Viewed in the Automobile Industry

Outline

ICETT is located in the Chubu region where the manufacturing industry is active. This training program focused on the automobile sector, one of the region's leading industries, and took as its theme industry-wide environmental conservation, and learned about the efforts and approaches taken by local governments, auto manufacturers, and recycling businesses. In a time when global warming is a serious worldwide concern, sustainable development without regard for the environment is unthinkable. The international students who took part in this program varied in their majors and specialties, but the program was designed to offer them a comprehensive perspective on addressing environmental problems in their home countries, as well as on a global scale.

Program Outline

Seven international students, one each from China, Ghana, Uzbekistan, the Philippines and Laos, and two from Myanmar, took part in the program. They are studying disparate subjects at universities throughout Japan, including Oita, Niigata and Tokyo, but share the motivation to learn as much as they can during their stay in Japan. This motivation could be felt strongly from the many questions they asked during lectures and tours.

The program started with a lecture on the history of pollution and environmental restoration in Yokkaichi. The lecture, which incorporated films and images showing how the pollution occurred, and what effect it had, seemed highly gripping and shocking at the same time, as it reminded them that the same could happen in their own countries, where rapid economic growth is under way.

Since the theme of the training program was "Sustainable Development and Environment in the Automobile Industry," the participants also enjoyed field trips to various environment-related facilities in the auto industry.

Among the most interesting of such facilities was Suzuka Auto Recycle Center, which processes entire vehicles for reuse and recycling, without producing shredder dust. After the removal of auto parts for reuse, and the removal of airbags and gasoline, vehicles are compressed by huge 300-ton crushing machines and transformed into mere chunks of metal, even as we watch. These "chunks," which include seats and windshields, are then transported to steel plants, where they become materials for iron and asphalt.

Also at Wonderland Mie, we were able to hear a valuable talk. It concerns refining waste vegetable oil from households and restaurants into biodiesel, and use it to fuel cars. The cars emit CO_2 when they are driven, but because the fuel is of plant origin, and plants absorb CO_2 during their growth process, their CO_2 count is zero, according to the Kyoto Protocol. It was rewarding for us program organizers to see the participants in earnest discussion with the lecturers regarding the viability of this technology in their own countries.

At the Suzuka Auto Recycle Center

Participants looking attentively at biodiesel fuel

Hinamatsuri (Doll's Festival) Experience

Since the training program took place in March, to introduce the participants to some Japanese traditional culture ICETT invited them to a *Hinamatsuri* celebration, with *hina arare* (rice puffs eaten at *Hinamatsuri*) and a display of *hina* dolls. Since the participants had already spent more than a year in Japan, they also tried their hands at *karuta* card games. They normally study in English, and their Japanese was not fluent, but they enjoyed simple games of *karuta* and had a fun time.

We would like to close with out best wishes for the participants' success in their home countries upon completing their studies in Japan, and offer out sincere hope that the ICETT program will be beneficial to their future careers.

(Yada)

Participants enjoying a game of *shiritori karuta*

Project to suceed and develop the basic philosophy of Aichi Expo

The Project on Invitation to Japan for Environmental Research (PIER)

Outline

The basic philosophy of the 2005 World Exposition in Aichi, Japan, which successfully ended in September 2005, was "Bringing together and internationally exchanging the wisdom of the world to address global issues." To succeed and develop this basic philosophy, ICETT has invited leading researchers in environment-related fields to Japan, the objective being to encourage transfer to the researchers' own countries of the knowledge and technologies they acquire through their research activities in Japan. This is the third year of the program, which began in fiscal 2007. In fiscal 2009, four researchers (one each from Uzbekistan and Thailand, and two from Cote d'Ivoire) are successfully carrying out research in Japan with the cooperation of the host organizations. This issue of ICETT News will report on the researchers' day-to-day activities (as of early October, 2009), based on their own accounts. (Uchida)

Profile of Guest Researchers and their Host Organizations

Water Area (July 2009 to March 2010)

- **Researcher:** Ms. Elena N. Ginatullina, Senior Researcher, of Hydroecology Laboratory, Institute of Water Problems, Republic of Uzbekistan
- **Host Organization and Supervisor:** Laboratory of Environmental Chemical Analysis, Department of Environmental and Energy Chemistry, Kougakuin University. Associate Prof. Minori Kamaya
- **Research Theme:** Water quality monitoring and modeling using Daphnia magna as bioindicator
- **Activities in Japan:** Each morning I arrive at the lab saying my morning greeting in Japanese, "ohayou gozaimasu!," and start my day. I feed and maintain the Daphnia magna, at times conducting bioassays according to their stages of growth. Activities at Prof. Kamaya's lab are very productive. Especially interesting is the observation of the feeding activity of Daphnia using fluorescent micro beads. By means of a fluorescent microscope it is possible to observe the fluorescent micro beads passing through the digestive system of Daphnia. The experiment is not only intriguing but also leads to the investigation of the digestive mechanisms.

  On days off I enjoy socializing with colleagues at barbecue parties and other events, many of which I had not experienced in my home country.

Air Area (August 2009 to April 2010)

- **Researcher:** Mr. Ittipol Paw-armart, Environmental Official, Air Quality and Noise Management Bureau, Pollution Control Department (PCD), Ministry of Natural Resources and Environment, Kingdom of Thailand.
- **Host Organization and Supervisor:** Laboratory of Clothing and Environment, Faculty of Human Ecology, Graduate School of Kyoritsu Women's University. Prof. Kunio Yoshizumi
- **Research Theme:** Studies on characterization of emission and behavior of air pollutants in the urban environment
- **Activities in Japan:** I engage in research from 9:00 a.m. to 5:00 p.m. Three days a week I do research focusing on volatile organic compounds present in gasoline (the so-called BTEX group) in the urban environment, at Prof. Yoshizumi's lab at the Graduate School of Kyoritsu Women's University. The remaining two days I spend at Tokyo Metropolitan Research Institute for Environmental Protection, analyzing particulate matter of organic carbon and elemental carbon, using the NIOSH 5040 method, under the supervision of Dr. Ishii. (In November, Mr. Ittipol received research guidance on particle size distribution of particulate matter, at the Center for Environmental Science in Saitama)

  I am thankful to the program for not only enabling me to develop my research, but also for the opportunity to meet Japanese people and experience their fascinating culture. I believe the program can help build a network of cooperation among engineers and scientists in Asia, as well as among engineers and scientists worldwide.

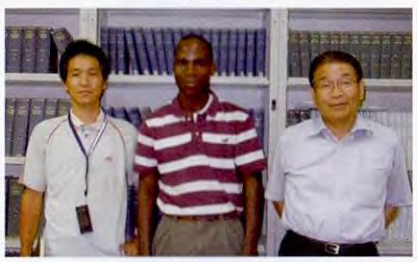


Water Area (August 2009 to April 2010)

- **Researcher:** Dr. Kouassi K. Lazare, Lecturer/Researcher, Ecological Research Center, University of Abobo-Adjame, Republic of Cote d'Ivoire
- **Host Organization and Supervisor:** Environmental Fluid Dynamics Laboratory, Department of Maritime Engineering, Graduate School of Engineering, Kyushu University. Prof. Toshimitsu Komatsu
- **Research Theme:** Simulation of sedimentation process in lakes for water quality management
- **Activities in Japan:** I take about 26 minutes to reach the university by bicycle. After arriving at around 8:30 a.m. I do most of my research at Kyushu University Graduate School. I leave the lab for home at around 6:30 p.m.

When we conducted a survey of coastal erosion phenomena at Senri Matsubara Beach, I was very impressed by the way the team used highly sophisticated equipment to obtain accurate measurements.

Another memorable event was the party held to celebrate one of the graduate students on the completion of his thesis. We spent a very good time together, drinking and bowling well into the night.



Waste Management Area (August 2009 to April 2010)

- **Researcher:** Mr. Ahou F. Botto, Chief of Service, Waste Management, Environmental Quality Department, Ministry of Environment, Water and Forests, Republic of Cote d'Ivoire
- **Host Organization and Supervisor:** Research Institute of Environment for Sustainability, Department of Urban and Environmental Engineering, Graduate School of Engineering, Kyushu University. Prof. Takayuki Shimaoka
- **Research Theme:** Investigation and inventory-making of pollutants from informal sector for the decision of the hazardous waste management plan
- **Activities in Japan:** On weekdays I work at the laboratory from 8:40 a.m. to 6:20 p.m. There I conduct document research using the Internet and other sources, develop survey plans and questionnaires based on my research, and discuss them with colleagues. When I visited a PCB waste treatment facility in Kitakyushu, I was surprised by its large scale.

On weekends I go shopping or explore the town, sometimes with Mr. Lazare. Back in my country, I used to think that the Japanese worked all the time without ever partying, so I was very impressed by the welcome party lab colleagues held for us. I learned that the Japanese have fun together, too.



In January 2010, all four researchers met at ICETT to give their interim report presentations. They also attended lectures relating to their respective research topics, or took part in field trips. By these means the researchers deepened their knowledge of voluntary environmental management efforts by businesses and various government programs.

The photographs are from the report presentation and the tour of the Lion Akzo Co., Ltd. Yokkaichi Plant. This was the first visit to this plant by an ICETT program.


Enjoying a Japanese Holiday with Barbecue

Taking part in three JICA training programs at ICETT, 24 participants from 23 countries enjoyed barbecue at Yokkaichi Sports Land. They also contributed to international exchange by playing soccer with local children.

On June 28, 2009, under a sky that looked as if it was going to rain any minute, we took off to Yokkaichi Sports Land with 24 participants (from 23 countries) who were respectively participating in one of three training programs: "Waste Management for Promoting Recycling-Oriented Societies", "Environmental Management Technology in Chemical Industries" and "Capacity Building for Project Staff Regarding Kyoto Mechanism".

Although it was still early in the day, the participants were in high spirits. Upon arriving at the "day camping ground" (picnic area), they lost no time in preparing for the barbecue. As expected, everyone seemed used to barbecues, and got down to cutting vegetables, preparing the fire, or making their country or region's unique barbecue sauce (dip) using avocados, tomatoes and onions. Preparations were complete in no time at all, and the barbecue party began in earnest. There was singing and dancing as everyone helped themselves to grilled meat and vegetables, accompanied by generous amounts of special dip. Dip was new to me but I liked it very much and thought it went well with the meat. Fried noodles and rice balls seemed unfamiliar to the participants, but were received well.

Preparing for a BBQ is a breeze

The day being a Sunday, there were other groups and families enjoying barbecues nearby. They became curious about our group, and we eventually struck up conversations with them. We enjoyed the brief interaction with the local community, sharing dip, chatting and holding their babies.

Once our appetites were sated, we started playing soccer with the local children who happened to be at the camping ground. Everyone momentarily forgot about the training program, and went after the ball as if they were small kids again.

With local children after soccer

The ugly sky had turned sunny by then, so much so that we got sunburned. At day's end everyone joined in to clean up and haul all the paraphernalia back, the social event concluding on a very lively note.

A home stay program had originally been planned for the participants, but unfortunately it became unavailable. The barbecue was held to somehow make up for their disappointment and give them an occasion to enjoy. We are sure the day added another happy memory to their stay in Japan. After the event, we felt more strongly about continuing to incorporate events like this into our training programs, which would enable the international participants to socialize with the local community.

(Yada)

24 participants from 23 countries

ICETT Receives Environment Minister's Award

ICETT's activities won the "Fiscal 2009 Environment Minister's Award for Activities to Prevent Global Warming" from Ministry of the Environment.

The annual prize, inaugurated in fiscal 1998, recognizes individuals and organizations that have made significant contributions to the prevention of global warming.

ICETT was awarded an international contribution category award for "activities to support the reduction of greenhouse gas emissions in developing countries."

ICETT Chairman Fumio Kawaguchi (also Chairman of Chubu Economic Federation) attended the award ceremony on December 2, 2009 and received the award from Mr. Kazuhiko Takemoto, Vice-Minister for Global Environmental Affairs, Ministry of the Environment.

(Ito)

ICETT

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March 2010