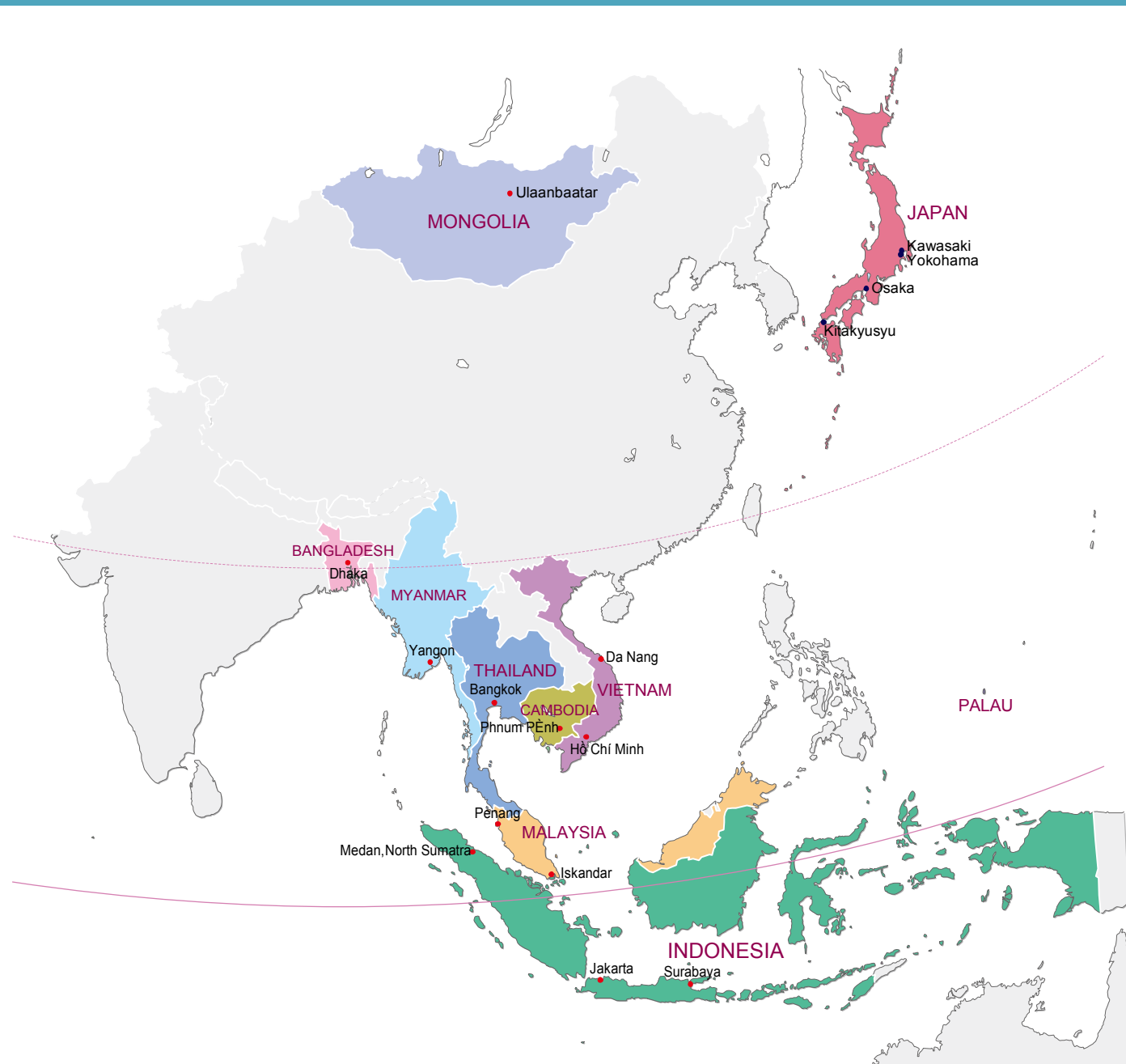


Feasibility Studies on Joint Mechanism Projects towards Environmentally Sustainable Cities in Asia



Ministry of the Environment, Japan

March 2014

Project Overview

In order to halve global emissions of greenhouse gases in 2050, it will be necessary to accelerate trends in Asian-Pacific countries with strong economic growth toward identifying and organizing projects to reduce greenhouse gas emissions on a large scale and building a sustainable low carbon society in Asia.

To achieve this, it will be necessary to develop a new mechanism (JCM: Joint Crediting Mechanism) for properly evaluating the contribution of Japan to reduction of energy-originated CO₂ emissions in overseas countries.

In this project, studies are being conducted on the feasibility of organizing large-scale projects as regional packages like entire cities or areas. This will be done by establishing management and maintenance systems together with Japanese research institutions, local public bodies, private companies and other relevant organizations, while adapting Japanese technologies and systems to suit local conditions.

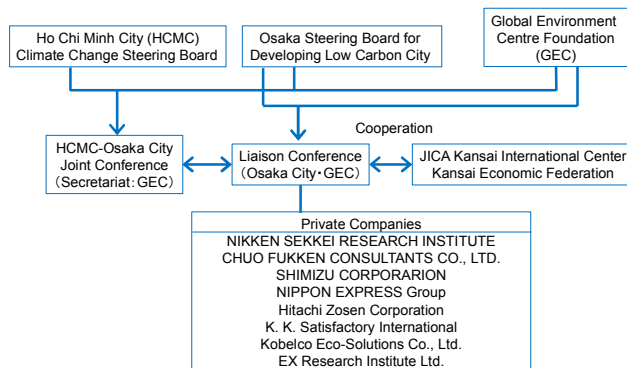
◆ List of Projects for FY2013 ◆

No.	Project name	Country	Region/City	Responsible organization
1	Ho Chi Minh City -Osaka City cooperation project for developing low carbon city	Vietnam	Ho Chi Minh	Global Environment Centre Foundation
2	JCM large scale feasibility project to promote water saving and energy saving products in Vietnam	Vietnam	Ho Chi Minh	Mitsubishi UFJ Morgan Stanley Securities Co., Ltd.
3	Feasibility study on low carbon community development project for promoting and commoditizing electric motorbikes in Vietnam	Vietnam	Ho Chi Minh Da Nang	Mitsubishi UFJ Morgan Stanley Securities Co., Ltd.
4	Introduction, issue identification and evaluation of Japanese technologies of waste management and processing in Da Nang City, Vietnam	Vietnam	Da Nang	Overseas Environmental Cooperation Center, Japan
5	Technical assistance for designing a low carbon city plan in Surabaya, Indonesia	Indonesia	Surabaya	Institute for Global Environmental Strategies
6	Feasibility study on financing scheme development project for promoting energy savings in Jakarta, Indonesia	Indonesia	Jakarta	Mitsubishi UFJ Morgan Stanley Securities Co., Ltd.
7	Project for leapfrog development in waste and wastewater management sector for North Sumatra province in Indonesia	Indonesia	Medan, North Sumatra	Mitsubishi UFJ Research and Consulting Co., Ltd.
8	Feasibility study on large-scale projects for greenhouse gas emission reduction in Iskandar, Malaysia	Malaysia	Iskandar	The Japan Research Institute, Limited
9	Project for developing a low carbon society through "Waste to Energy technology" in Penang, Malaysia	Malaysia	Penang	Global Environment Centre Foundation
10	Feasibility study of dissemination of Japanese standard digital tachograph [ASEAN "Smart Tachograph" Initiative (ASTI)] and unification of regional standard in ASEAN, Jakarta (Indonesia) and Bangkok (Thailand)	Indonesia Thailand	Jakarta Bangkok	Denso Corporation
11	Strategic promotion of recovery and destruction of fluorocarbons in Indonesia, Thailand and Malaysia	Thailand Indonesia Malaysia	Bangkok Jakarta Iskandar Penang	E&E Solutions Inc.
12	Eco-friendly water supply system in ASEAN countries: CO ₂ half water supply project in Medan (Indonesia), Iskandar (Malaysia) and Ho Chi Minh City (Vietnam)	Indonesia Malaysia Vietnam	Medan Iskandar Ho Chi Minh	Pacific Consultants Co., Ltd.
13	Efficiency improvement of energy supply side and demand side in Ulaanbaatar City, Mongolia	Mongolia	Ulan Bator	Overseas Environmental Cooperation Center, Japan
14	Low carbon & safe water supply in rural area: CO ₂ free clean water supply project in Bangladesh	Bangladesh	Dhaka	Pacific Consultants Co., Ltd.
15	Supporting low carbon Yangon city through Joint Crediting Mechanism (JCM) project formulation	Myanmar	Yangon	Institute for Global Environmental Strategies
16	Quantification of GHG reduction effect of countermeasures in water supply sector and study of MRV methodology in Phnom Penh City, Cambodia	Cambodia	Phnom Penh	Overseas Environmental Cooperation Center, Japan
17	Integration of mitigation and adaptation measures in South-Pacific Island Countries	Palau, Samoa, Fiji, Tonga, Vanuatu, Kiribati, Tuvalu		Pacific Consultants Co., Ltd.

The goals of this project will include identifying and organizing large-scale deployment of regional package type JCMs based on application of Osaka's systems that incorporate its outstanding environmental technology from Osaka and mechanisms for environmental administration; launching a collaborative organization between the two cities; and establishing management and maintenance systems such as master plan development. The project will strive to make Ho Chi Minh City (Vietnam) a low carbon city, and a model for other megacities.

【Project Description】

- Improve fuel efficiency of trucks, and reduce truck traffic volume through cooperative delivery systems
- Conserve energy in buildings
- Construct local energy supply systems
- Improve transportation services of route buses
- Develop the environment for utilizing electric scooters and community bicycle programs
- Adopt waste power generation systems
 - Adopt high-efficiency factory waste water treatment systems



〔Traffic situation in Ho Chi Minh City〕



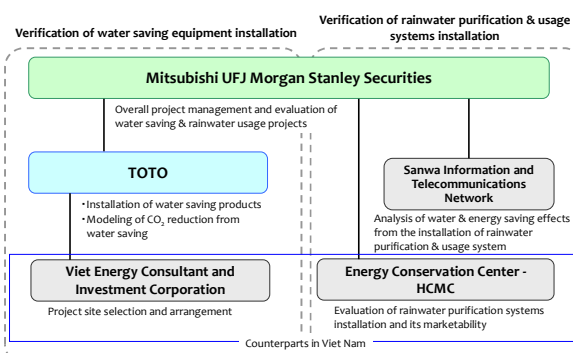
〔Waste water treatment facility in industrial park〕
Illust provided by: Kobelco Eco-Solutions Co.,Ltd.

The main goal of this project will be to reduce CO₂ emissions in Ho Chi Minh City (Vietnam) through water conservation via dissemination of water-saving showers and toilets. This will help resolve water problems that Vietnam faces, such as water shortages and inundation of cities due to rain, and efforts will be made to organize ventures to achieve large-scale JCMs covering the entire cities or the country.

In addition to water conservation, studies will examine the feasibility of deploying energy conservation technology, and the project will strive to develop a total energy reduction scheme considering finance.

【Project Description】

- Project to verify the adoption of water-saving equipment
 - The effectiveness of water-saving equipment will be measured in a single hotel (150 rooms), and a methodology will be developed for water conservation credits for buildings
- Project to verify the adoption of purification systems utilizing rainwater
 - The effectiveness and safety of rainwater purification systems will be verified, and project development will be promoted through cooperation with water administration and government agencies relating to environmental problems.



〔Water-saving toilet〕



〔Water-saving shower〕

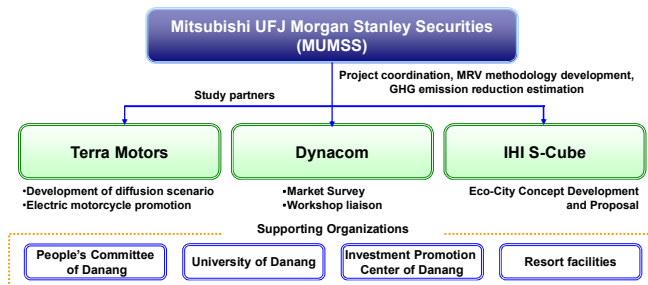
This project will strive to disseminate Japanese electric scooters with outstanding durability in the city of Da Nang (Vietnam). It will help improve the living environment for people, and contribute to reducing emissions of greenhouse gases due to the combustion of gasoline.

In addition, adoption of a "community motor concept"* will be considered for efficiently distributing the electric scooters, and the project will aim to raise awareness in Vietnam about creating low carbon communities which are friendly to people and the environment.

* IT-based system for managing the sharing of vehicles that can identify the vehicle user, unit, location and time of such vehicle being used.

【Project Description】

- Conduct feasibility study on dissemination of electric scooters, and formulate plan for project to disseminate electric scooters in Da Nang
- Examine methods of raising awareness about the advantages of the electric scooter technology to be adopted and methods of adoption
- Prepare plan for demonstration project
- Closely examine MRV methodology and estimate GHG reduction potential



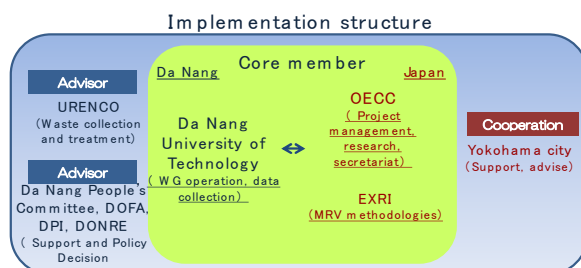
[e-Tricycle] [e-Scooter]

Photos provided by: Terra Motors Corp.

The city of Da Nang is located in the center of Vietnam, facing a beautiful seashore at the eastern edge of the east-west economic corridor. The city is expected to grow further as a key center for economic development. But due to the rapid increase in wastes from population growth and economic development in recent years, the city faces the issue of shortage in its landfill sites. In this regard, this project aims at promoting waste volume reduction, proper treatment, and adoption of resource reclamation in the waste field in Da Nang, utilizing Japanese experience and technology.

【Project Description】

- Quantify the effect of GHG emissions reduction associated with waste volume reduction and resource reclamation, and develop MRV methodologies
- Conduct feasibility study on introductions of waste management and treatment technologies in the waste sector
- Conduct capacity building for waste management and resource reclamation technology in the waste field in Da Nang



A beautiful seashore is the focus of the tourism industry



The Khanh Son landfill site has little remaining capacity

Kitakyushu City has a track record of more than 10 years of intercity cooperation with the city of Surabaya (Indonesia), and many projects have previously been carried out in areas such as waste management, sewage treatment, and energy management. In November 2012, an agreement on collaboration as “environmental sister cities” was signed in order to deepen ties between the two cities. In this program, projects will be selected which enable reduction of GHG emissions in four fields—energy, transportation, wastes and water resources—in order to support the reduction of GHG emissions in Surabaya.

【Project Description】

➤ Energy sector:

Adopt cogeneration systems for industrial parks and large commercial buildings, and adopt energy conservation measures and distributed power generation for buildings (offices, commercial buildings, hotels), etc.

➤ Transportation sector:

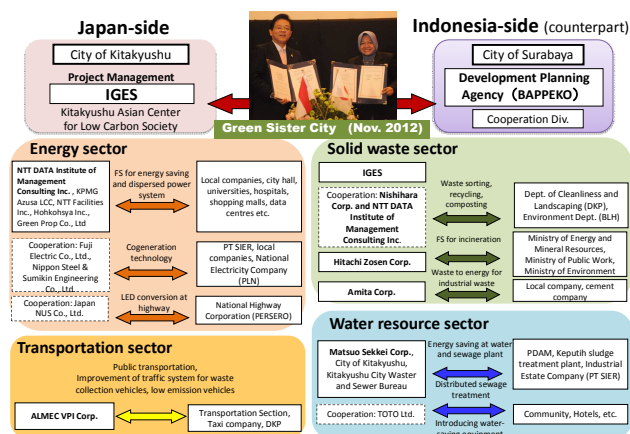
Adopt low-emission vehicles as public transportation vehicles (buses, taxis, share taxis) and waste hauling vehicles, and improve traffic control via transport demand management, etc.

➤ Waste sector:

Reduce waste volume and perform composting at recycling-based intermediate treatment facilities for general-waste, consider power generation by incinerating waste, and convert industrial wastes to fuel, etc.

➤ Water resource sector:

Take measures to conserve energy and reduce water leakage by improving purification plant operations and upgrading pumps, etc.



This project will strive to introduce energy management in order to optimize energy efficiency on the consumer side. Effective financial schemes will be examined for promoting dissemination of low-carbon, low-emission vehicles, and outstanding energy-saving equipments and Japanese technologies, and it will be used in tailoring financing projects according to local needs.

The study will examine energy-saving potential at the Indonesian government facilities and at private sector facilities, taking into consideration that the energy management network system will be expanded to renewable energy and/or transportation-related energy-conservation projects. The aim of the study is to develop energy management projects in Indonesia to promote joint efforts in energy conservation between Japan and Indonesia.

【Project Description】

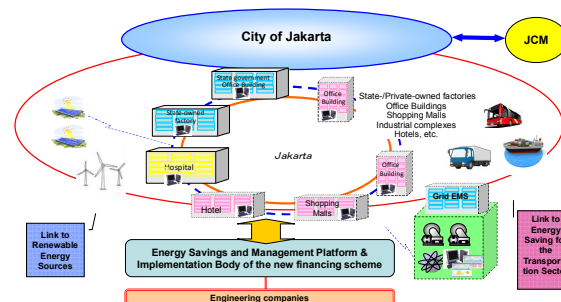
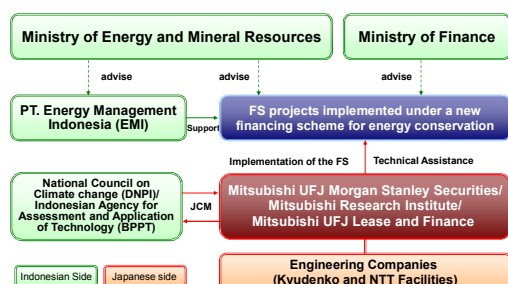
➤ Review existing results of energy auditing reports

➤ Examine energy-saving technologies and methods to be introduced

➤ Examine MRV methodology and estimate GHG reduction potential

➤ Conduct basic investigation for developing a financial scheme for dissemination of low-carbon and low-emission vehicles

➤ Propose recommendations to policies relating to financial schemes for promoting energy conservation



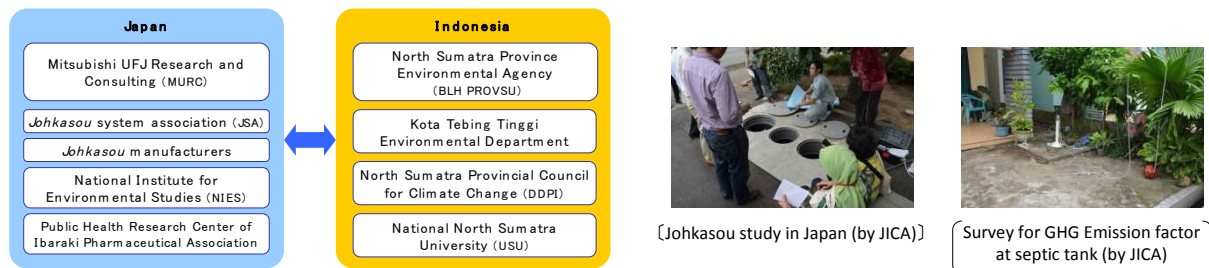
In North Sumatra province, based on background capacity for promoting JCM projects developed by JICA greenhouse gas inventory and mitigation projects conducted since 2011, multiple projects will be carried out to reduce GHG emissions from waste and wastewater treatments starting in 2014. The highest priority of the projects is to contribute to protecting environment in North Sumatra province by reinforcing waste and wastewater management. In 2014, the first JCM project in North Sumatra province of “*Johkasou* installation project” will be started in cooperation with North Sumatra environmental agency.

Johkasou is decentralized wastewater treatment facility for household and commercial sector.

Compared with existing septic tank, it can significantly reduce contaminants in effluent wastewater as well as GHG emissions.

【Project Description】

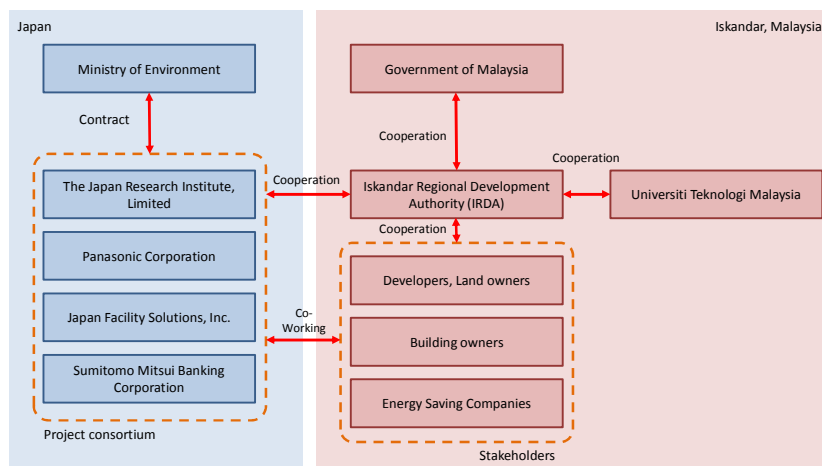
- Conduct feasibility study for large scale installation of *Johkasou* and establishing its maintenance system as the first JCM project in North Sumatra province
- Identify effective other JCM projects for leading better waste and wastewater management
- Capacity development for understanding and promoting JCM projects in North Sumatra province



Based on the LCSBP (Low Carbon Society Blueprint)—the roadmap for achieving a low carbon society formulated collaboratively by Japan and Malaysia for the Iskandar Development Region (Malaysia)—this project will promote organization, on a large scale, of JCM-based projects to reduce greenhouse gas emissions, by realizing the LCSBP while actively utilizing outstanding Japanese technology and products applicable for a smart city.

【Project Description】

- Formulate implementation plan with an eye toward early development of the LCSBP
- Apply Japanese technology and institutions to the region in accordance to local circumstances
- Develop systems for operation and maintenance in collaboration with IRDA
- Examine and establish an ESCO business model for realizing ESCO business



[First inception meeting]



[Scene of development progressing in city]

The aim of this project will be to improve the efficiency of waste management policy in Penang state (Malaysia), and introduce green innovation technologies from Kawasaki that are combined with energy production—thereby contributing to reduction of greenhouse gas emissions in the state and realizing the "co-benefit" of mitigating severe waste problems.

【Project Description】

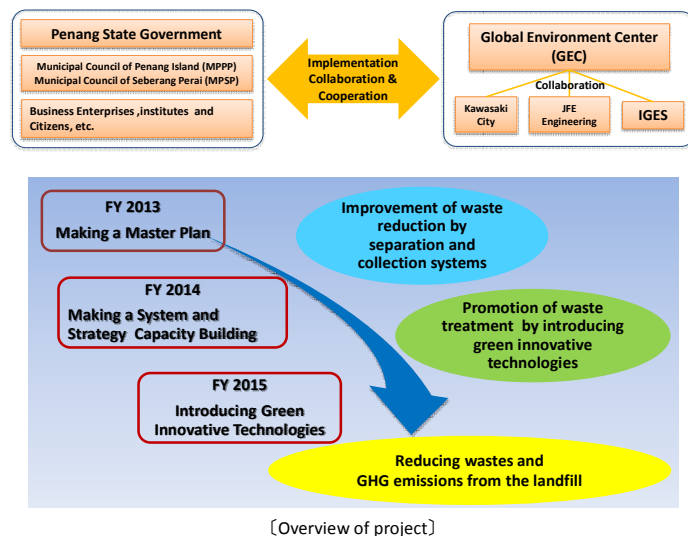
- Low carbon waste treatment project to contribute to waste reduction and improvement of treatment
- Study the feasibility of introducing Japanese legal institutions and technologies to the partner country, determine key contact persons, and ascertain the needs of the partner country relating to capacity development etc.



[Resource reclamation through sorting work]



[Group collection of reclamation]



This project will carry out pilot experiments in the two cities of Jakarta (Indonesia) and Bangkok (Thailand), focusing on logistics and bus companies. The aims will be to ascertain the feasibility of introducing Japanese legal institutions and technologies to the partner country, determine key contact persons, identify the needs of the partner country relating to capacity development etc., and examine/plan "single package" approaches combining regional integration and standardization for use throughout the ASEAN countries with transportation policies for each country, systems for industry-academia-government collaboration, and project schemes.

【Project Description】

- Introduce digital tachographs conforming to Japanese standards, and conduct pilot experiments to verify its effectiveness
 - Integrate and analyze running data using communications systems
 - Provide guidance and training for drivers on safety and eco-driving, and conduct periodic monitoring of fuel consumption and CO₂ reduction effectiveness after providing improvement guidance.



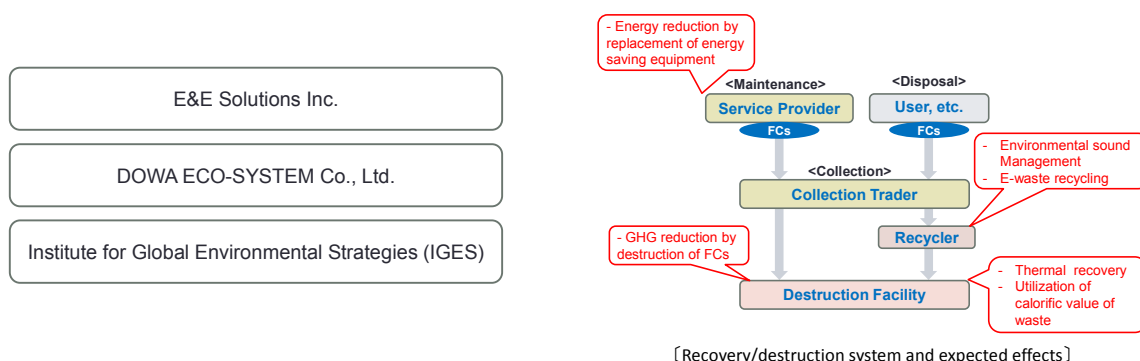
[Overview of project]

Many freezer, refrigerator and air-conditioning products have been disseminated in the Asian countries and there is potential for replacement of energy saving product. On the other hand, none have a scheme for recovering these used products. They do not handle them properly follow through the destruction of fluorocarbons, and thus it is likely that fluorocarbons will be released into the atmosphere.

This survey project will be conducted—focusing on Jakarta (Indonesia), Iskandar and Penang (Malaysia) and Bangkok (Thailand)—with the goal of creating a mechanism for destruction of the fluorocarbons (CFC, HCFC, HFC) used in appliance products etc., collection of used equipment (End of Life , EOL) which will be necessary as a first stage, and recovery of fluorocarbons.

【Project Description】

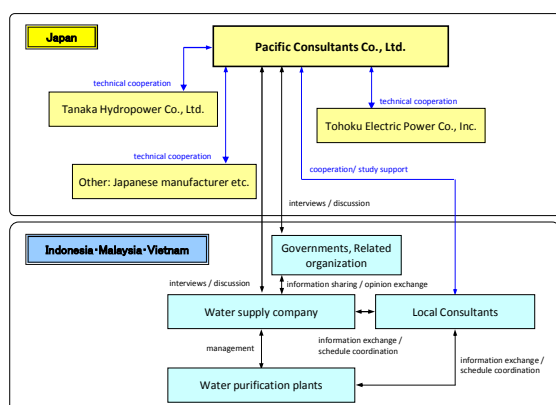
- Study feasibility of introducing Japanese legal institutions and technology to the partner countries
- Examine effectiveness of replacement with energy-saving equipment
- Determine key contact persons, and ascertain the needs of the partner country relating to capacity development etc.
- Examine low carbon waste treatment projects to contribute to waste reduction and improvement of treatment



This project will work to develop stable power sources to complement individual generation technologies, by introducing multiple types of renewable energy in waterworks facilities in Medan (Indonesia), Iskandar (Malaysia) and Ho Chi Minh City (Vietnam). Furthermore, the project will strive to reduce the amount of power purchased by waterworks facilities, and the large accompanying GHG emissions, by also adopting energy-saving technologies.

【Project Description】

- Identify waterworks facilities where projects can be carried out
- Ascertain the feasibility of technology adoption and project profitability
- Examine continuous and stable funding scheme
- Develop a project scheme applicable for projects at multiple locations
- Calculate reduction in CO₂ emissions by carrying out project
- Evaluate potential for reducing CO₂ emissions after the dissemination (of the system) in applicable countries



[Micro hydroelectric generator]



[Small wind power generator]

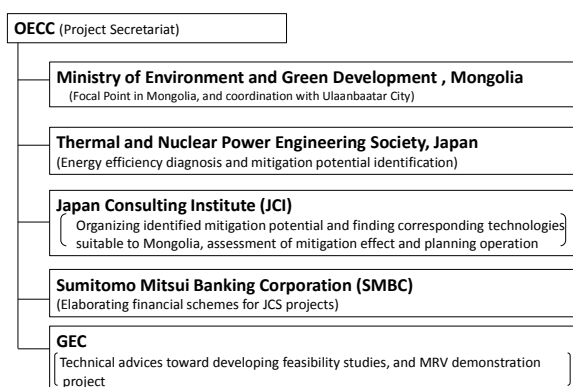
Photos provided by: Tanaka Hydropower Co., Ltd, (left), and Zephyr Corporation (right)

On January 8, 2013 in Ulaanbaatar City, documents were signed relating to a bilateral crediting mechanism between the Mongolian Ministry of Environment and Green Development and the Ministry of the Environment, Japan, and a Joint Crediting Mechanism (JCM) was formally started. In April, the first joint committee meeting was held, and the committee adopted basic rules and operating principles relating to the mechanism.

This project will provide support for building JCM projects relating to the issues faced by Mongolia, such as urgent demand for electric power, and the need to improve efficiency on both the energy supply and demand side to contribute to the mitigation of air pollutions.

【Project Description】

- Reduce GHG emissions by improving efficiency of coal-fired combined heat and power (CHP) plants
- Reduce GHG emissions by improving efficiency of coal-fired heat only boilers (HOB)
- Carry out improvements such as energy conservation in areas such as water treatment, buildings and factories



〔Field survey of heat only boiler (HOB)〕



〔Coal-fired combined heat and power plant in Ulaanbaatar City〕

Focusing on Bangladesh, where many residents lack access to safe water, this project will determine the feasibility of achieving packaged BOP business combining easy to set up water purification equipment developed by Japan with renewable energy equipment for supplying the power needed for water purification.

【Project Description】

- Ascertain the water supply in rural areas, the supply of electric power for target groups and regions, and issues/efforts in each case
- Ascertain policies, development goals, plans, laws/regulations and approvals/licensing relating to water supply and electrification in rural areas
- Ascertain policies, relevant laws/regulation, relevant approvals/licensing, and potential relating to renewable energy
- Ascertain available financing and system funding
- Examine water purification technologies and power generation using renewable energy, etc.

Pacific Consultants Co., LTD.

Cooperation

Nippon Poly-Glu Co., Ltd.



〔Water purification facility〕



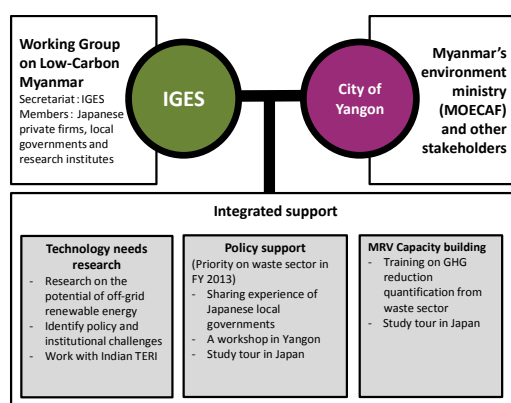
〔Top: Store offering purified water to customers〕
〔Bottom: Pure water delivery service〕

Photos provided by: POLY-GLU SOCIAL BUSINESS CO.,LTD

In order to promote low carbon development of the city of Yangon (Myanmar), this project will investigate technologies for municipal waste management and decentralized, off-grid renewable energy projects. The aim is identifying the needs of Myanmar, identifying potential projects, and providing policy support and capacity building to the Yangon City in cooperation with Japanese firms and local governments.

【Project Description】

- Waste management project: Organize local workshop, and provide policy support and capacity building by training Yangon city staff in Japan
- Off-grid renewable energy project: Investigate the potential of solar lanterns and other off-grid renewable energy technologies for unelectrified regions in Myanmar
- Organize liaison meetings with governmental agencies, private companies, local governments, and research institutions in Japan
- Awareness raising on Japanese initiatives through participation to international conferences in Myanmar

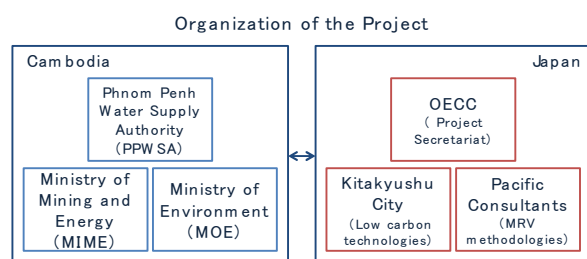


〔First Domestic Liaison Committee Meeting〕

The rate of access to safe water in Cambodia remains at a low level of 61.7% (2011). In addition, 93.4% of Cambodia's electric power (in 2010) comes from diesel and heavy oil, and electricity bills are extremely high. About 80% of the expenditures of the Phnom Penh Water Supply Authority are costs for electricity. Adopting low carbon technologies and operating techniques in the waterworks sector will contribute greatly to reducing greenhouse gas emissions, reducing electricity costs, strengthening the management foundation of the water supply corporation, and supplying safe water to the public. Therefore, this project will provide support for building JCM projects, with the goal of introducing technology to prevent water leaks and energy-saving equipment in waterworks facilities in Cambodia.

【Project Description】

- Quantify the effect in reducing greenhouse gas emissions by water leakage countermeasures and energy conservation in the waterworks sector, and examine MRV techniques
- Conduct feasibility study of building JCM projects in the waterworks sector
- Perform capacity building for transferring Japanese low carbon technology and operation techniques in the waterworks sector



〔Inception Workshop (September 2, 2013)〕



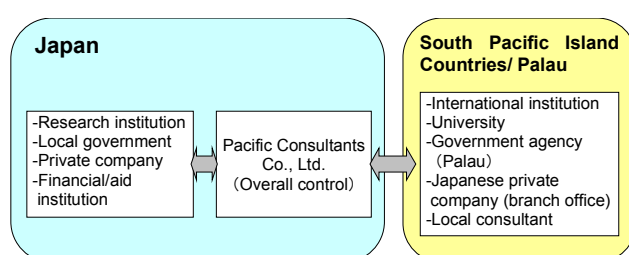
〔Phum Prek Water Treatment Plant, Phnom Penh〕

Concerning climate change, it is clear that adaptation is the most critical to the Small Island Developing States (SIDS). However, certain mitigation activities such as renewable energy will address their needs, bring co-benefits, and make adaptation measures more efficient.

The objective of this feasibility study is to develop a “SIDS low-carbon model” which integrates both mitigation and adaptation measures considering the needs and characteristics of the South-Pacific Island Countries.

【Project Description】

- Identify adaptation needs in island countries, and mitigation needs related to adaptation
- List Japanese adaptation technologies and low carbon technologies suited to identified needs
- Design a model for reducing carbon in island countries which can be disseminated as a regional package
- Conduct specific review of project scheme
- Examine project's effectiveness in reducing greenhouse gas emissions, and its secondary effects
- Examine framework for demonstration project



[Coastal erosion in Palau]

The following three platforms for local governments, companies, and research institutions (researchers and universities) have been established as forums for exchanging views and interaction among partner countries, cities in partner countries and domestic stakeholders, for supporting the program building of large-scale JCM projects. For details, please check each portal site.

Information web site for low carbon development in Asia http://www.env.go.jp/earth/coop/lowcarbon-asia/	<ul style="list-style-type: none"> ➤ Trends in international negotiations and related institutions ➤ Low carbon and environment related policies in Asian countries, etc.
Business alliance support web site for low carbon development in Asia http://lowcarbon-asia.org/	<ul style="list-style-type: none"> ➤ Information on low carbon technology possessed by Japanese firms ➤ Consultation service relating to overseas expansion, etc.
Local government information web site for low carbon development in Asia http://www.env.go.jp/earth/coop/lowcarbon-asia/localgov/	<ul style="list-style-type: none"> ➤ Policies to support international cooperation ➤ Information on consortiums with countries, etc.
Website of the Low Carbon Asia Research Network (LoCARNet) http://lcs-rnet.org/	<ul style="list-style-type: none"> ➤ Low carbon research activities in Asia ➤ Low carbon related research results and researchers

【 Issued by】

Ministry of the Environment, Japan

International Cooperation Office, International Strategy Division, Global Environment Bureau

17th floor, Daido Seimei Kasumigaseki Bldg, 1-4-2, Kasumigaseki, Chiyoda-ku, Tokyo 100-0013

Tel: +81-3-5521-8248 Fax: +81-3-3581-3423

【 Executive office】

Mizuho Information & Research Institute, Inc.

Environment and Energy Division 1

2-3 Kanda-Nishikicho, Chiyoda-ku, Tokyo 101-8443

Tel: +81-3-5281-5287 Fax: +81-3-5281-5466 E-mail: asia-jcm@mizuho-ir.co.jp