## City-to-City Collaboration for Low-Carbon Society

# 2018



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#### Programme background

The concentration of populations in urban areas is on the rise in developing countries where economic developmentis skyrocketing. To create low-carbon, resilient societies in these countries, low-carbon urban infrastructure and facilities that will be used for long periods of times should be introduced from the outset, and it is necessary to encourage a switch to low-carbon infrastructure and facilities when updating that which is already in place.

Under the Kyoto Protocol, the development of superior low-carbon technologies has gained ground and policies and measures have been introduced to expand the use of such technologies in Japan, which is promoting energy conservation looking towards the creation of low-carbon societies, under its obligation to reduce greenhouse gas (GHG) emissions.

In order to contribute to the achievement of leapfrogstyle development in cities in developing countries through the development and packaging of knowledge and knowhow on these technologies and policies, the Ministry of the Environment (MOEJ) launched the "City-to-City Collaboration for Low-Carbon Society" ("City-to-City Collaboration Programme") in 2013. Since then, Japan has made contributions to international society towards he achievement of the goals of the Paris Agreement in collaboration with a diverse set of entities both in Japan and abroad.



Conceptual diagram of leapfrog development

Source: National Institute for Environmental Studies

#### **Programme Overview**

Under this framework where cities in developing countries collaborate with cities in Japan, support is provided for human resources development and the creation of institutional foundations in cities in developing countries by considering the development of low-carbon projects in collaboration with private companies and sharing knowledge and know-how on urban management in Japan through intercity collaboration. Due to the concentration of various infrastructure in cities, the introduction and development of superior low-carbon technologies, products, and systems in these facilities will not only help with the low-carbon development of cities, but are also expected to produce various co-benefits, such



Low-carbon project development under the City-to-City Collaboration Programme (an example)

as improving the environment and energy supply in cities.

When introducing low-carbon technologies on the ground, it will also be possible to utilize financial schemes (Box 2) under the Joint Crediting Mechanism (JCM, Box 1) promoted by the Government of Japan.



• Capacity building for local staffs

Outline of City-to-City Collaboration Programme

## Benefits for Participating Stakeholders

programme have the opportunity to gain various benefits. Many Asian cities participating in this project expect that their involvement will lead to the improvement of their urban environment and capacity of staff.

Both Japanese cities and companies as well as partner cities and companies overseas that participate in this

Benefits for cities overseas	<ul> <li>Strengthen foundation to manage low-carbon cities through the transfer of superior systems, standards, experiences, and know-how</li> <li>Improve capacity of staff</li> <li>Formulation or implementation of low-carbon city plans</li> <li>Development of low-carbon cities at lower administrative costs as a result of public-private</li> <li>partnerships (PPP)</li> <li>Co-benefits, such as environmental improvement and energy supply</li> </ul>
Benefits for companies overseas	<ul> <li>Low-cost introduction of superior low-carbon facilities/equipment</li> <li>Reduced running costs as a result of low-fuel economy performance and fewer failures</li> <li>Strengthen linkages between cities and Japanese companies</li> <li>Improve capacity of staff</li> </ul>
Benefits for cities in Japan	<ul> <li>Promote overseas deployment of local companies and regional revitalization through these activities</li> <li>Improve capacity of employees</li> <li>Improve reputation of city and public awareness</li> </ul>
Benefits for companies in Japan	<ul> <li>Build business foundation through the sales of own products and showcases on site</li> <li>Ease of approaching markets and related institutions and acquisition of local information</li> <li>Improve capacity of staff</li> </ul>

#### Box 1 : What is the Joint Crediting Mechanism (JCM)?

The Joint Crediting Mechanism (JCM) is a mechanism jointly created and implemented under an agreement between the Government of Japan and a partner country's government to achieve Japan's GHG emissions reduction targets by quantitatively evaluating and understanding Japan's contributions to the reduction/absorption of GHG emissions achieved through the spread of superior low-carbon technologies (technologies/ products, systems, services, infrastructure, etc.) and the implementation of policies that can lead to a reduction in GHG emissions in developing countries. The JCM also contributes to the achievement of the ultimate objective of the United Nations Framework Convention on Climate Change by promoting actions to reduce and absorb GHG emissions on a global scale. Japan is implementing the JCM with 17 countries: Mongolia, Bangladesh, Ethiopia, Kenya, Maldives, Viet Nam, Laos, Indonesia, Costa Rica, Palau, Cambodia, Mexico, Saudi Arabia, Chile, Myanmar, Thailand, and the Philippines. (As of July 2018)



#### Box 2 : JCM financial mechanisms: What is the JCM Model Project?

The JCM Model Project is a program to measure, report, and verify (MRV) the implementation of projects to reduce and absorb GHG emissions, as well as Japan's contributions to the emission reduction effects with the use of superior low-carbon technologies in JCM partner countries and developing countries where the JCM is expected to be implemented. JCM credits are issued according to the calculated amount of emissions reduced/absorbed, which are then applied to Japan's emissions reduction target. If adopted, financial support will be provided for the introduction of equipment and machinery that use superior lowcarbon technologies.

As of July 2018, 127 projects (17 countries) have been adopted and a CO<sub>2</sub> reduction of more than 850,000 tonnes annually is anticipated.

Source: Ministry of the Environment, Japan. List of adopted JCM Model Projects in JCM partner countries (FY2013-2018)

## List of City-to-City Collaboration for Low Carbon Society in FY2018

## Fukushima – Ayeyarwady and Sagaing, Myanmar

01	Study on Feasibility of the Building of Low-carbon Regional Development and Promotion of Activities in Ayeyarwady Region and Sagaing Region	Implementation Body Mitsubishi Research Institute, Inc.	
Kawasaki – Jakarta, Indonesia			
02	Promotion on Green Innovation through JCM City-to-city Collaboration in DKI Jakarta (Green Building and Green Power Optimization)	Implementation Body Nippon Koei Co., Ltd.	
Kawasaki – Yangon, Myanmar			
03	Feasibility Study of JCM Project by City-to-City Collaboration in Yangon City (Utilization of Energy and Energy Saving in Fruits and Vegetables Wholesale Market)	Implementation Body Nippon Koei Co., Ltd.	
Yokohama – Port Authority of Thailand			
04	Feasibility Study for Assisting Ports in Thailand to Reduce $\rm CO_2$ Emission and to Become "Smart Ports" in FY2018	Implementation Body Yokohama Port Corporation	
Yokohama – Batam, Indonesia			
05	Project for Development of Low-carbon City through City-to-City Collaboration between Batam and Yokohama (Promotion of Green Building Regulation and Optimization of Renewable Energy Utilization in Industrial Parks)	Implementation Body Nippon Koei Co., Ltd.	
Toyama – Semarang, Indonesia			
06	Study for Low-carbon Society by the Introduction of Energy Saving Equipment in Industry Sector of Semarang City	Implementation Body Nippon Koei Co., Ltd.	
Toyama - Bali, Indonesia			
07	Support on Tourism Future City of Bali Province through City-to-City Collaboration	Implementation Body Nippon Koei Co., Ltd.	
Osaka – Quezon, Philippines			
08	City-to-City Collaboration between Osaka and Quezon (Introduction of Energy-saving Technologies to Factories, Introduction of Solar Power Generation System to Landfill, and Low-carbonization in Transportation)	Implementation Body Oriental Consultants Co., Ltd.	
Osaka – Ho Chi Minh, Viet Nam			
09	Support for Realization of Low Carbon Society through City-to-City Collaboration in Ho Chi Minh City (Promoting Energy Efficiency Equipment in Water Supply System)	Implementation Body Nippon Koei Co., Ltd.	
Kitakyushu – Davao, Philippines			
10	Project to Realize Low-carbon Society in Davao City through Support for Development of Local Climate Change Action Plan (Kitakyushu-Davao Cooperative Project)	Implementation Body Institute for Global Environmental Strategies	
Kitakyushu – Phnom Penh, Cambodia			
11	Project to Realize Low-carbonization in Transportation, Green Production Fields and so on based on the Action Plan for the Climate Change Strategy in Phnom Penh Capital City (Kitakyushu-Phnom Penh Cooperation Project)	Implementation Body Nikken Sekkei Civil Engineering Ltd.	
Kitakyushu – Chiang Mai, Thailand			
12	Project to Accelerate Low-carbonization in Newly Developed Industrial Estate through Ecological Industrial Town Concept (Kitakyushu- Chiang Mai Province, IEAT and DIW Cooperation Project)	Implementation Body NTT Data Institute of Management Consulting, Inc.	
Kitakyushu - Hai Phong, Viet Nam			
13	Project to Accelerate Low-carbonization in Hai Phong City (Feasibility Study on Low-carbon Project Mainly through Eco Park in Vietnam) (Kitakyushu-Hai Phong Cooperation Project)	Implementation Body NTT Data Institute of Management Consulting, Inc.	
Kitakyushu – Mandalay, Myanmar			
14	Project to Realize Low-carbonization in Mandalay Region in the Field of Waste & Energy (Kitakyushu- Mandalay Cooperation Project)	Implementation Body NTT Data Institute of Management Consulting, Inc.	



#### Study on Feasibility of the Building of Low-carbon Regional **Development and Promotion of Activities in** Mitsubishi Research Institute, Inc. Ayeyarwady Region and Sagaing Region.

Under city-to-city collaboration in a partnership to promote low-carbon development between the Ayeyarwady and Sagaing regions, the potential to develop projects for energy-saving and renewable-energy technologies through the use of biomass, such as rice husks, is being examined. Support is also being offered to enhance capacity for development of low-carbon industrial parks and the formulation of master plans to contribute to the smooth implementation of projects and give shape to new lowcarbon industrial parks in order to achieve the creation of strong, resilient, and sustainable local cities.



#### **Project outline**

- Examination of the potential to develop projects for energysaving and renewable-energy technologies through the generation of power and use of heat with biomass, such as rick husks, in order to give shape to new, low-carbon industrial parks
- Support for activities to enhance capacity for the development of low-carbon industrial parks and the formulation of master plans to contribute to the smooth implementation of projects



March 2018: Introduction of city-to-city collaboration activities to rice millers throughout the country utilising the plenary session of the Myanmar Rice Federation. The exhibition booth was visited by Aung San Suu Kyi, State Counsellor of Myanmar, where activities were directly explained.



February 2018: Local workshops, business exchange, field visits, courtesy visit and exchange of ideas with the Minister of



#### REPUBLIC of INDONESIA (awasaki∶ akarta

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#### Promotion on Green Innovation through JCM City-to-city **Collaboration in DKI Jakarta** (Green Building and Green Power Optimization)

Nippon Koei Co., Ltd.

Under the City-to-City Collaboration Programme between Kawasaki City and the Special Capital Territory of Jakarta, the introduction of energy-saving technologies for air conditioning for about 10 highrise buildings in the centre of Jakarta is being considered with the aim of promoting "green buildings" in Jakarta in cooperation with PT. Azbil Berca Indonesia (an Indonesian subsidiary of PT. Azbil Berca).

The programme is also aiming to gain an understanding of the current situation of heat utilization and recovery of exhaust heat in existing facilities and examining room for improvement with the purpose of promoting "green industries" for various factories located in the Jakarta area.

The programme aims to "create green innovation" in Jakarta by promoting "green buildings" and "green industries" through cityto-city collaboration between Kawasaki city and the Special Capital Territory of Jakarta. In particular, the project aims to make effective use of the "Sustainable Development Goals (SDGs)" in order to achieve a more advantageous and clear-cut position for city-to-city collaborative activities.



#### **Project outline**

- Aims to promote "green buildings", one of the Jakarta's high-profile issues, by sharing Kawasaki city's knowledge on the creation of an advanced environmentally-balanced city (Kawasaki Eco-Town) and considering the introduction of energy-saving technologies for air conditioning in high-rise buildings in the centre of Jakarta
- Aims to create "green industries" in Jakarta by formulating a JCM project for energy conservation related to heat exchange and heat recovery for industrial sector facilities, such as factories in the Jakarta area and neighbouring areas
- Effective use of the "Sustainable Development Goals (SDGs)" and implementation of city-to-city collaboration for priority issues in Jakarta (waste, renewable energy, sustainable urban alteriate) planning)







The cities of Kawasaki and Yangon signed a memorandum of agreement at the end of March 2016 on city-to-city collaboration with a view to the medium- to long-term implementation of cooperation to create a low-carbon society. Basic policies under this collaboration include the following: (1) human exchange to achieve low-carbon development, (2) support for environmentally-friendly urban development, such as environmental monitoring, and (3) waste management technologies. In this programme, organic waste generated from new fruit markets in Yangon is examined for its potential use in biogas power generation through methane fermentation using the sophisticated technologies (WTM system: Food Waste Methane Fermentation System) of companies in Japan. The effective utilization of business waste will reduce the volume of waste treated in the city and control CH<sub>4</sub> emissions from open dumping, as well as contribute to the reduction of CO2 emissions through the supply of electricity in the market.



#### **Project outline**

- Studies on quality and volume of waste from fruit markets and design of biogas power generation system
- Studies on current situations and achievements in waste collection and electricity consumption in fruit markets
- Examination of the potential to develop projects for the introduction of biogas power generation in fruit markets and negotiations with local companies
- Consideration of monitoring systems
- Consensus building of international consortiums and other groups related to JCM projects
- Gain an understanding of the issues and needs in the waste sector in Yangon through intercity collaboration and provision of support, such as the sharing of knowledge and information towards the creation of a low-carbon society in Kawasaki



Flow of Food Waste Methane Fermentation System (WTM System)

# Vokohama× 04 Feasibility Study for Assisting Ports in Thailand to Reduce CO2 Emission and to Become "Smart Ports" Yokohama×

Surveys are conducted to introduce superior, low-carbon technologies and products that have a proven track record in Yokohama Port to Laem Chabang Port, which is managed and operated by the Port Authority of Thailand (PAT), to support the promotion of the low-carbon and smart development of all Thai international ports that are highly-public logistics bases. In the medium- to long-term, the programme aims to develop Thai ports as low-carbon, smart logistics centres in the ASEAN region.



#### **Project outline**

- Aims to develop smart ports that use energy efficiently by combining low-carbon facilities, such as electric and hybrid cargo handling machinery, with solar power equipment installed in the port area
- Conduct of studies on the reduction of GHG emissions and business profitability when each type of low-carbon equipment is introduced



Leam Chabang Port

05 Project for Development of Low-carbon City through City-to-City Collaboration between Batam and Yokohama (Promotion of Green Building Regulation and Optimization of Renewable Energy Utilization in Industrial Parks)

Yokohama has contributed to the smart and green development of Batam Island with the pillar of cooperation in six sectors with the city of Batam and the Batam Indonesia Free Zone Authority (BIFZA), since a memorandum of understanding was signed on technical cooperation through intercity collaboration between the two cities in 2015. Through this cooperation, this project aims to achieve (1) the low-carbon and smart development of industrial parks through the effective introduction of renewable energy and peak shifts in power plants by demand responses. The project will also (2) develop a green building system based on the characteristics of Batam city by sharing Yokohama's experiences and knowledge in building assessments (CASBEE Yokohama).



#### **Project outline**

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Yokohama Batam

- Consideration of measures to both maximise the introduction of renewable energy and stabilise power supply by introducing energy management systems (EMS) in core industrial parks and linking renewable energy to existing thermal power generation facilities
- Forecasts on energy demand and solar power generation between multiple facilities in industrial parks and consideration of how to optimise the use of energy, such as peak shifts through demand response
- Sharing of Yokohama's experience and knowledge in building assessments (CASBEE Yokohama) with Batam city and the Indonesia Green Building Association and support for the introduction of Batam's version of a green building system



Optimise the use of renewable energy in industrial parks

## REPUBLIC of INDONESIA

## Study for Low-carbon Society by the Introduction of Energy Saving Equipment in Industry Sector of Semarang City

The city of Semarang has formulated scenarios for a lowcarbon society in 2030. In those scenarios, energy-saving projects in industrial parks in the industrial sector, which have high potential to reduce CO<sub>2</sub> emissions, are being promoted through the introduction of high-efficiency boilers, conversion to natural gas, and introduction of high-efficiency chillers under the city-to-city collaboration programme between Toyama and Semarang and using the technologies of local companies in Toyama, and are being developed as models for low-carbon development of the urban industrial sector.



#### **Project outline**

- Formulate plans for model projects for the introduction of industrial energy-saving equipment and fuel conversation in industrial parks in Semarang
- Introduction of high-efficiency boilers and application of high-efficiency turbo chillers in industrial parks
- Promotion of measures for the development of a low-carbon society in Semarang based on the Eco-City policies of Toyama city
- Development of a low-carbon model for the industrial sector to contribute to achievements in the reduction of CO<sub>2</sub> emissions in the industrial sector in Semarang



Strategic steps towards the achievement of a low-carbon society

**Toyama**×Bali

#### Support on Tourism Future City of Bali Province through 07 **City-to-City Collaboration**

Nippon Koei Co., Ltd.

This programme aims to create an environmentally-friendly tourism city by sharing the knowledge and achievements of Toyama as a Future City with Bali province, an international tourism city, and provide cooperation and support for various types of energy demand in the province with the participation of Japanese companies, centring on local companies in Toyama. The cities also plan to develop the potential of energy savings and renewable energy in hotels and restaurants in Bali province, as well as the urban transport sector and aim to formulate projects that involve stakeholders from both cities.



#### **Project outline**

- Consider the introduction of various energy-saving equipment in tourism facilities, such as hotels and restaurants, to achieve the development of a lowcarbon, tourism city in Bali province and introduce renewable energy utilising the abundant natural resources in the province. Aim to develop low-carbon urban transport and formulate model business plans, such as fuel conversion
- Utilise Toyama city's knowledge as a Future City and aim at the creation of a low-carbon tourism city in Bali province

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Meeting with stakeholders in Bali province (Tabanan Regency)

Public buses in Bali province that are expected to be targets for fuel conversion

Small hydropower facility in Bali province (manufactured by Suikikogyo)



City-to-City Collaboration between Osaka and Quezon (Introduction of Energy-saving Technologies to Factories, Introduction of Solar Power Generation Oriental Consultants Co., Ltd. System to Landfill, and Low-carbonization in Transportation)

Feasibility studies are conducted on upgrading and expanding the JCM project development and promotion manual, implementation of energy-saving projects in factories, updates and efficiency improvements to waste collection trucks, and the introduction of photovoltaic power generation at largescale waste disposal sites, based on city-to-city collaboration between the cities of Osaka and Quezon.



#### **Project outline**

- Create manual for the development and promotion of JCM projects to promote the formulation of JCM projects in accordance with Quezon's climate change action plan
- Share Osaka city's knowledge through bilateral dialogues at the mayoral level and workshops
- Conduct energy-saving diagnoses for large-scale factories in Quezon city and aim to introduce energy-saving technologies from Japan
- Aim to develop more efficient engines for waste collection vehicles and introduce energy-saving vehicles, in addition to studies on the introduction of solar energy in large-scale waste disposal sites managed by Quezon city



Energy-saving diagnoses in factories



Capacity building in Osaka city



## Support for Realization of Low Carbon Society through City-to-City Collaboration in Ho Chi Minh City (Promoting Energy Efficiency Equipment in Water Supply System)

Under the JCM city-to-city collaboration programme between the cities of Osaka and Ho Chi Minh (HCMC), the introduction of inverters (for pumps) are being considered to contribute to improving the efficiency of pump operations in water purification plants with supplier Hitachi, which has a track record of sales to water purification facilities in the city and has already established good relationships. The potential to introduce various JCM projects in waterworks facilities will also be examined.



#### **Project outline**

- Support for considering the potential for introducing inverters in waterworks facilities
- Consideration of implementation systems for international consortiums, including the feasibility for financing projects
- Examination of the feasibility for MRV support by local businesses
- Examination of issues related to the formulation of JCM projects in Viet Nam, including public projects







Meetings with stakeholders from the Ho Chi Minh People's Committee



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### Project to Realize Low-carbon Society in Davao City through Support for Development of Local Climate Change Action Plan (Kitakyushu-Davao Cooperative Project)

Under the new framework of "green sister cities" concluded between the cities of Kitakyushu and Davao, studies are carried out on the feasibility of creating a Local Climate Change Action Plan (LCCAP) and implementing waste-to-energy projects and other low-carbon projects in Davao, as well as the possibility of application of the JCM Model Project to support the promotion of the development of a low-carbon society in Davao.



#### **Project outline**

- Support for the formulation of a Local Climate Change Action Plan (LCCAP) in Davao
- Examination of the potential to apply the JCM Model
   Project to waste-to-energy (WtE) projects
- Examination of the potential for implementing other lowcarbon projects in Davao



Signing the Memorandum of Understanding for Green Sister Cities between the City of Davao and the City of Kitakyushu (28 November, 2017)

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Project to Realize Low-carbonization in Transportation, Green Production Fields and so on based on the Action Plan for the Climate Change Strategy in Phnom Penh Nikken Sekkei Civil Engineering Ltd. Capital City (Kitakyushu-Phnom Penh Cooperation Project)

Under the sister city relationship between the cities of Phnom Penh in the Kingdom of Cambodia and Kitakyushu, project development surveys are carried out on the introduction of electric three-wheelers using renewable energy as power sources, agricultural biomass power generation projects, and energy-saving, organic wastewater treatment projects in the three sectors of transportation, green production and environmental conservation that are expected to be target areas for the JCM, aiming at the large-scale reduction of GHG emissions, in order to put pilot projects into action based on the Phnom Penh Climate Change Strategic Action Plan formulated in 2017.

### **Project outline**

<Transportation sector>

Plan to control air pollution and reduce CO2 emissions by replacing existing gasoline and LPG three-wheelers, one of the causes of air pollution in Phnom Penh, with low-polluting electric three-wheelers

Green production sector>

Conduct of projects on biomass power generation using agricultural residue, such as rice husks as fuel at rice mills and farms, to reduce CO<sub>2</sub> emissions by reducing power and fossil fuels consumed on site.

<Environmental conservation sector> Consideration of the introduction of economical, energy saving wastewater treatment facilities (new techniques) large-scale food factories and livestock production facilities that discharge organic wastewater that can meet wastewater standards and are easy for companies to accept.





Separation of solids and liquids with newly-developed coagulant

#### Project to Accelerate Low-carbonization in Newly Developed Industrial Estate through 12 Ecological Industrial Town Concept (Kitakyushu- Chiang Mai NTT Data Institute of Province, IEAT and DIW Cooperation Project) Management Consulting, Inc.

Survey activities (Activity 1) are being implemented for industrial parks that are being newly developed to formulate projects that can lead to the acquisition of JCM credits with the promotion of the introduction of environmentally-friendly transportation systems, spread of high-efficiency and energysaving equipment with common specifications that can be easily installed in newly-built industrial parks, and the introduction of high-efficiency boilers for shared use through the development of an eco-industrial town. The programme also focuses on survey activities (Activity 2) that aim at the formation of projects that can be connected to the acquisition of JCM credits, centred on facility biomass in order to shape business opportunities that have been developed in past activities.

#### Project outline

Activity 1

KINGDOM of THAILAND

Promote the spread of EV buses and cycle sharing using renewable energy and high-efficiency, energy-saving equipment with common specifications that can be easily installed in new industrial parks, as well as the introduction of high-efficiency boilers for shared use in the Sa Kaeo industrial park that is being promoted for new development by IEAT.

Activity 2

Examination of the use of biomass in facilities where food waste is generated, such as large-scale industrial parks and hotels, in addition to two fuel conversion projects (conversion to biomass gas and biomass fuel) that were identified in activities carried out in previous fiscal years.





Image of project: Conversion of existing heavy-oil fuel to biomass gas



## Project to Accelerate Low-carbonization in Hai Phong City (Feasibility Study on Low-carbon Project Mainly through Eco Park in Vietnam) (Kitakyushu-Hai Phong Cooperation Project)

Survey activities are being carried out that aim at the formation of Viet Nam's version of Eco-Town and the formation of lowcarbon projects through follow-up activities aiming at the realization of green growth in the cities of Kitakyushu and Hai Phong carried out to date, towards the achievement of green growth and Hai Phong's aim to become a low-carbon society.



#### **Project outline**

<Creation of low-carbon projects through the achievement of a Vietnamese version of Eco-Town>

Aim at the acquisition of JCM credits for low-carbon projects through the achievement of Viet Nam's version of Eco-Town, which will also contribute to the achievement of green growth and Hai Phong's aim to become a low-carbon society

<Creation of low-carbon projects through follow-up activities> Conduct of project feasibility studies on low-carbon transportation, including EV buses utilising low-carbon electric power, such as biomass power generation and solar power generation, mainly through follow-up on power generation through the recovery of waste heat from cement factories



Power generation system through the recovery of waste heat

## 14 Project to Realize Low-carbonization in Mandalay Region in the Field of Waste & Energy (Kitakyushu- Mandalay Cooperation Project)

Under the cooperative relationship between the cities of Kitakyushu and Mandalay, survey activities are being carried out aiming at (1) the achievement of projects to stabilise electric power supply by reducing energy costs and introducing distributed power supply in the energy sector, and (2) improving the environment to develop waste treatment facilities, as well as the introduction of biogas recovery and utilisation facilities in the waste management sector.



#### Project outline

Energy sector

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Aim to achieve the objectives of projects to develop energy savings, such as chillers, and introduce photovoltaic power generation systems for large hotels, airports and hospitals, as well as introduce high-efficiency equipment for primary industrial sectors and reduce energy-derived CO<sub>2</sub> emissions.

Waste sector

Aims to reduce greenhouse gas emissions through the introduction of a high-efficiency methane gas recovery facility provided by Japanese companies and use recovered methane gas as cooking fuel, as a way to properly treat municipal solid waste.



Image of proper treatment of municipal solid waste

#### Toyama-Semarang (Indonesia)

## Introduction of mixed CNG and diesel combustion facility for public transport buses in Semarang

#### Result of the City-to-City Collaboration Programme

Toyama city, which has concluded a collaborative agreement with Semarang city on the achievement of a low-carbon society, carried out a project development feasibility study to create a low-carbon public transportation system for a compact city in Semarang using the knowledge and technology of "compact city development centred on public transportation". This study examined policies to introduce applied technologies, evaluate the effects of CO<sub>2</sub> emission reductions due to the implementation of the project, and confirm relevant legal systems.

#### **Outline of GHG Mitigation Activity**

Of the 141 diesel buses operated by Trans Semarang, Semarang city's transportation company, a total of 72 vehicles with diesel engines (25 large buses and 47 medium-sized buses) were targeted to be refit with hybrid engines capable of using CNG to reduce GHG emissions through a shift in the fuel used.

#### Expected GHG Emission Reductions 1,870 t-CO<sub>2</sub>/year

Calculation of emission reduction effects when some diesel buses that are currently in operation are converted to buses equipped with hybrid engines.

#### **Project Implementer**

Japan: Hokusan Co., Ltd. Indonesia: BLU UPTD Trans Semarang



Signing the cooperation agreement (2017.12)



Organizational structure



## **Relevant Websites**







#### Web Portal for Low Carbon **Development in Asia**

http://www.env.go.jp/earth/coop/lowcarbon-asia/english/

This portal provides information regarding related policy trends and support systems for achievement of low-carbon development in Asia.

#### JCM – The Joint Crediting Mechanism

http://gec.jp/jcm/



This site introduces JCM Model projects and provides information on call for proposals.

#### **Carbon Markets Express**

#### https://www.carbon-markets.go.jp/eng/

This website will introduce JCM and carbon markets in the world, based on the information released by the government of Japan.



#### The Joint Crediting Mechanism

#### https://www.jcm.go.jp/



This official platform provides information and updates for the JCM.

#### **Guidebook "Creating Sustainable Low-Carbon** Cities through City-to-City Collaboration"

MOEJ published the guidebook titled "Creating Sustainable Low-Carbon Cities through City-to-City Collaboration" for promotion of the programme. It was prepared for city officials and the private sector within cities in developing countries interested in the Program.



## Low Carbon City Profile

-Climate Change Actions by Asian Cities in the City-to-City Collaboration Programme-

This booklet takes a look back on the past five years of the City-to-City Collaboration Programme and introduces the policies being implemented by the cities in Japan and overseas participating in this programme in order to create low-carbon cities.



## A City-to-City Collaboration Programme for supporting the development of plans in partner cities

#### Kitakyushu – Hai Phong (Viet Nam)

## Support for the formulation of the Hai Phong City Green Growth Promotion Plan through collaboration with Kitakyushu

#### Overview of the City-to-City Collaboration Programme

Since 2011, the Vietnamese government has promoted the development of a national system to achieve green growth. Hai Phong city also formulated the Hai Phong Green Growth Promotion Plan in 2014 and the Hai Phong City Green Growth Promotion Plan (2015) through this project in collaboration with Kitakyushu city under its sister city relationship, in order to further shape the city's green growth strategy (GGS). The plan comprises four key sectors and other sectors and contains 15

pilot projects that were identified based on analyses of the current state of each sector.

#### Achievements in the City-to-City Collaboration Programme

The Hai Phong Green Growth Promotion Plan also includes various measures and projects that can be connected to the formulation of JCM model projects. Under this plan, surveys are currently being carried out on the implementation of projects and the formulation of concrete projects.



## **Knowledge Exchange and Dissemination of the Programme**

MOEJ provides learning opportunities for cities and other stakeholders participating the City-to-City Collaboration Programme through workshops and seminars held in Japan. Those were held in Kawasaki (July 2017) and Tokyo (January 2018) in FY2017, in which participants from 15 cities of 7 countries participated and made the presentation of progress report, discussion about future developments and site visit to learn Japanese low-carbon technology. Taking these opportunities, participants from Asian cities also visited their Japanese partner cities to strengthen linkages each other by individual meetings with relevant stakeholders and local companies.

The progress and outcomes of the Programme are shared with a wider audience on such occasions as side-events at the UNFCCC-COP and seminars in Japan.



#### 5-Year History of the City-to-City **Collaboration Programme** (FY2013-2017) To date, 25 cities from 10 countries **Participating** in Asia and 12 cities in Japan Mongolia countries Ulaanbaatar City and cities Hokkaido City of Sapporo have taken part in the **City-to-City Collaboration Programme** Cambodia Siem Reap Province Kanagawa Prefecture Phnom Penh Capital City City of Kitakyushu Kanagawa Prefecture India Bangalore City City of Yokohama Philippines Quezon City City of Osaka Myanmar Sagaing Region Fukushima City Mandalay City City of Kitakyushu Yangon City Viet Nam Kawasaki City Ayeyarwady Region Fukushima City Hai Phong City City of Kitakyushu Da Nang City City of Yokohama City of Osaka Ho Chi Minh City Thailand Kien Giang Province City of Kobe Chiang Mai Province City of Kitakyushu City of Yokohama Laos Bangkok City of Kitakyushu **Rayong Province** Vientiane Capital City City of Kyoto Malaysia Kawasaki City **Penang State** City of Kitakyushu Iskandar Development Region Asian cities **25** municipalities in **10** countries Indonesia **Batam City** City of Yokohama Special Capital Region of Jakarta Kawasaki City Kawasaki City **Bandung City** Semarang City Toyama City City of Kitakyushu Surabaya City **Bali Province** Clean Authority of TOKYO





(As of January 2018)

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