

1. Study on Current Conditions of the Cities in Developing Countries involved in the Past City-to-City Cooperation Projects

1.1. Outline of the Study

This report summarizes the result of “Study on Current Conditions of the Cities in Developing Countries involved in the Past City-to-City Cooperation Projects.” The study is a part of FY 2017 project on “Evaluation and Verification of Establishing Infrastructure Systems in the Cities of Developing Countries.” The project is commissioned by the ministry of the Environment of Japan to the University of Tokyo and subcontracted by UNU-IAS. The copyright of this report belongs to the Ministry of the Environment of Japan.

1.2. Backgrounds and Purposes of the Survey

As a feasible reduction target, Japan’s Intended Nationally Determined Contribution (INDC) submitted to the United Nations Framework Convention on Climate Change (UNFCCC) in July 2015 sets 26.0% reduction by FY 2030 compared to FY 2013 (25.4% reduction compared to FY 2005) (approximately 1.042 billion t-CO₂eq. as 2030 emissions), ensuring consistency with its energy mix.

In addition, Japan estimates accumulated emission reductions or removals by FY 2030 to be ranging from 50 to 100 million t-CO₂ by appropriately evaluating GHG emission reductions or removals in a quantitative manner achieved through the diffusion of low carbon technologies, products, systems, services, and infrastructure and implementation of mitigation actions in developing countries, and the establishment and implementation of the Joint Crediting Mechanism (JCM) and to use them to achieve Japan's emission reduction target.

To achieve this target, it is important to assess and verify the effectiveness of CO₂ reduction technologies aiming to establish a global low-carbon society system by utilizing advanced technologies and experienced human resources, institutional arrangements and projects conducted to evaluate the CO₂ reduction feasibilities. It is also essential to evaluate and review the effectiveness of the projects in developing countries to support the development of climate change mitigation and adaptation plans and institutional system, as well as the initiatives to promote a low-carbon society at the city level.

Taking this into account, the study aimed to assess and verify the results of the “City-to-City Cooperation Projects for Realization of Low-carbon Societies” conducted so far. In doing so, the

study sought to provide insights to the future City-to-City cooperation projects and how to effectively promote low carbonization in the cities of the developing countries.

In this survey, interviews with stakeholders in Bangkok, Thailand, Da Nang City, Vietnam, and Surabaya City, Indonesia were conducted as well as their partner cities, Yokohama, Kitakyushu and private sectors involved in the past City-to-City cooperation projects. Based on the information obtained through these interviews, the study examined current situations of the cities of the developing countries and identified challenges of the City-to-City cooperation between Japan and the cities of the developing countries.

1.3. Study on Current Conditions of the Cities in Developing Countries involved in the Past City-to-City Cooperation Projects

1.3.1. Overview of the Study

This section summarizes the results of the study of three City-to-City Cooperation projects; Yokohama and Bangkok, Yokohama and Da Nang, and Kitakyushu and Surabaya. Bangkok, Thailand was selected because the city is developing the projects in the areas of (1) sustainable transportation measures, (2) promotion of measures for energy saving and renewable energy, (3) measures for wastes and wastewater, (4) urban greening and (5) adaptation planning, in accordance with Bangkok Climate Change Master Plan. The plan is developed from 2013 to 2023 under the technological cooperation project by the Japan International Cooperation Agency (JICA) and approved in July 2015 by the Governor of Bangkok. In addition, to establish and implement the above-mentioned BMA Master Plan on Climate Change, the “Memorandum of Understanding on Technical Cooperation for Sustainable Urban Development between Yokohama City and Capital Bangkok” was signed in October 2013. The Memorandum agrees to further deepen the existing City-to-City cooperation with Yokohama City, as well as to make specific efforts to create an environmentally-friendly and low-carbon city includes provision of technical advice from Yokohama in the five areas specified in BMA Master Plan.

The reason Da Nang City, Vietnam was selected is because many of the short, medium and long term JCM feasibility projects were considered in the factories and hotels to promote low carbonization in the city. In addition, the utilization and expansion of JCM was proposed as one of the means to realize and accelerate low carbonization of the city under the urban development action plan in Da Nang developed in cooperation with JICA and the city of Yokohama.

Thirdly, Surabaya City, Indonesia was selected as the city maintains a cooperative relationship with the city of Kitakyushu for more than 10 years. As a culmination of this achievement, Green

Sister Cities agreement was signed in November 2012, and various projects have been implemented through the cooperative relationship. From FY 2013 to FY2015, activities were carried out to formulate a JCM project in the areas of energy, transportation, waste, and water resources. As a result, the two sectors, energy and waste were identified as areas that had a high level of cost-effectiveness in terms of CO2 emissions, and which have high feasibility for development as JCM projects.

Since these three cities have been active in the development of their master plans and formation of the projects, understanding their current situations and identifying challenges of JCM Projects Formation through City-to-City cooperation would be useful to enhance and advance the future cooperation to realize effective low-carbon societies.

As a part of the study, several interviews with corresponding stakeholders including municipal governments and private sectors in the cities of the developing countries and their partner cities in Japan were conducted. Interview trip was held in Bangkok from the end of October 2017 to November, Da Nang in December 2017, and Surabaya in January 2018.

Interviews were conducted to answer the following research questions:

1. Has the city established its Low Carbon Plan or Action Plan? How far it is progressing and at what degree.
2. Were the capacity building activities conducted in the past city-to-city cooperation effective? (impact/effectiveness of capacity building activities)
3. What is the progress of project formulation and the status of application and adoption of JCM Model Project?
4. Did the city involved in any similar initiatives other than Japan?
5. How can these initiatives be further developed or progressed?
6. Are there any potential for co-benefit with aligning the local issues with the SDGs and contributing to it through the city-to-city cooperation?
7. Other matters that should be considered for the improvements of the future city-to-city cooperation.

1.3.2. Case between Yokohama City and Bangkok

Concluding a comprehensive partnership agreement with JICA in 2011, Yokohama City has developed the Bangkok Climate Change Master Plan and provided technological assistance through the Bangkok Climate Change Master Plan 2013-2023 project and JICA training programs. In October 2013, a Memorandum of Understanding on Technical Cooperation for Sustainable Urban

Development was concluded, and the utilization of knowledge in Yokohama City and excellent technologies of enterprises located there have been promoted. This agreement includes technological advice on energy management, public transportation, waste and sewage management, which contributes to the formulation and implementation of the climate change master plan. As a fund to realize the master plan project, the utilization of JCM was considered. The department in charge in Yokohama City is the Development Cooperation Division, Development Cooperation Department, International Affairs Bureau while that of Bangkok is the Bangkok Metropolitan Administration (BMA).

1.3.2.1. Overview of City-to-City Cooperation between Yokohama City and Bangkok

In January 2011, Yokohama City started the Yokohama Partnership of Resources and Technologies (Y-PORT) Project, where its resources and technologies are utilized in public-private collaboration¹. Since then, through the Y-PORT Project, Yokohama has been making full use of its expertise accumulated during the urban development process, and has been working on support for the resolution of urban issues in emerging countries and economic revitalization in Yokohama under the partnerships with enterprises richly experienced in overseas projects and having their bases in Yokohama.

As one of the features of Y-PORT, after establishing a partnership with overseas cities, the municipal government participates in upstream urban planning in collaboration with JICA² to pave the way for project formation by enterprises. In March 2012, the “Memorandum of Understanding on Technical Cooperation for Sustainable Urban Development” was concluded with Cebu City (the Philippines), and the City-to-City cooperation was started. In FY 2012, Yokohama City supported the formulation of sustainable urban development vision targeting the Metro Cebu, MEGA CEBU VISION 2050, in cooperation with JICA.

Starting the technological cooperation together with JICA toward the formulation of the “Bangkok Climate Change Master Plan 2013-2023” in March 2012, Yokohama City initiated another City-to-City cooperation by concluding the “Memorandum of Understanding on Technical Cooperation for Sustainable Urban Development between the City of Yokohama, Japan and Bangkok, the Kingdom of Thailand” in October 2013 so as to strengthen the relationship between the two cities and to

¹ Yokohama City’s “Yokohama Partnership of Resources and Technologies (Y-PORT)”
https://www.iges.or.jp/files/research/climate-energy/PDF/.../PM_6_hashimoto.pdf

²Yokohama City and JICA concluded a comprehensive partnership agreement on October 25, 2011.

utilize Yokohama’s experience and knowledge, as well as excellent technologies of the enterprises in the city.

Yokohama City and Bangkok cooperate with each other, expecting the revitalization of their economic activities through eco-friendly, sustainable urban development in Bangkok.

Table1 Detailed Cooperation between Yokohama City and Bangkok³

Details	
1.	For sustainable urban development in Bangkok, Yokohama City shall provide technological advice on energy management, public transportation, waste and sewage management, etc.
2.	The two cities shall invite private sectors, academic institutions, and local communities having expertise and experience related to the promotion of low-carbon societies for achievement of the goal specified in 1.
3.	The two cities shall call for support from their governments and international organizations in order to obtain proper support in implementing technological cooperation.
4.	The two cities shall mutually provide information indispensable in conducting the above-mentioned partnership efficiently.

In addition, Yokohama also conducted a low-carbon technology mission and other activities by participating in the “FY 2014 Feasibility Studies on JCM Projects towards Environmentally Sustainable Cities in Asia ‘Accelerating Implementation of Bangkok Master Plan on Climate Change’” by the Ministry of Environment.

1.3.2.2. City-to-City Cooperation Projects between Yokohama City and Bangkok Supported by the Ministry of Environment and Their Progress

In November 2015, Japan and the Kingdom of Thailand signed the bilateral document on JCM. For two years from FY 2014 to FY 2016, the Ministry of Environment supported the City-to-City cooperation projects between Yokohama City and Bangkok through the Feasibility Studies on JCM Projects towards Environmentally Sustainable Cities in Asia (Accelerating Implementation of Bangkok Master Plan on Climate Change in FY 2014; JCM projects development (energy efficiency, and waste and waste water) under the Bangkok Master Plan on Climate Change, and study on financial and other facilitation schemes for introducing low carbon technologies in FY 2015).

³ From the material of a press release by Yokohama
<http://www.city.yokohama.lg.jp/kokusai/yport/pdf/20131021pressrelease.pdf>

In these projects, traffic, energy and waste projects where JCM will be used under the BMA climate change master plan were cultivated and researched in the first year for the purpose of researching the cultivation and feasibility of JCM projects in the public and private sectors. In addition, business matching with enterprises having good low-carbon technologies was offered, and technological guidance was provided for domestic private enterprises. In the second year, JCM project formation research in the energy saving, waste and sewage treatment sectors was conducted while examining the technological compatibility and system requirements as a potential JCM project research. This survey has targeted the stakeholders who played leading roles in the above-mentioned projects. They are the Development Cooperation Division, Development Cooperation Department, International Affairs Bureau, Yokohama Municipal Government, Azbil (Thailand) Co., Ltd., finetech Co., Ltd., BMA, Taksin Hospital, PEA ENCOM, Prime Road Group, Thailand Greenhouse Gas Management Organization(TGO), and Wan Thai Foods Industry.

1.3.3. Case between Yokohama City and Da Nang City

Yokohama City and Da Nang City started cooperation in urban development and infrastructure development in 2013. The department in charge in Yokohama City is the Development Cooperation Division, Development Cooperation Department, International Affairs Bureau while that of Da Nang City is the Department of Planning and Investment (DPI). Although Da Nang City has concluded sister city agreements with around 50 cities through the Department of Foreign Affairs for cooperation in various areas, DPI as the main leader takes the initiative only in bilateral cooperation with Yokohama City, under which direct investment is made through the Financing Programme for JCM Model Projects.

In the urban development action plan⁴ drawn up in cooperation with JICA and Yokohama City for the promotion of low-carbon development in Da Nang City by formation of the Financing Programme for JCM Model Projects candidates targeting factories and hotels which are feasible in the short/medium/long run among the activities implemented so far and by developing the Financing Programme for JCM Model Projects, and utilization of JCM was proposed as one of the means to realize the projects.

⁴Formulated in March 2016.

1.3.3.1. Overview of the City-to-City Cooperation between Yokohama City and Da Nang City

In January 2011, Yokohama City started the Yokohama Partnership of Resources and Technologies (Y-PORT) Project, where its resources and technologies are utilized in public-private collaboration⁵. Since then, through the Y-PORT Project, Yokohama has been making full use of its expertise accumulated during the urban development process, and has been working on support for the resolution of urban issues in emerging countries and economic revitalization in Yokohama under the partnerships with enterprises richly experienced in overseas projects and having their bases in Yokohama.

As one of the features of Y-PORT, after establishing a partnership with overseas cities, the municipal government participates in upstream urban planning in collaboration with JICA⁶ to pave the way for project formation by enterprises. In March 2012, the “Memorandum of Understanding on Technical Cooperation for Sustainable Urban Development” was concluded with Cebu City (the Philippines), and the City-to-City cooperation was started. In FY 2012, Yokohama City supported the formulation of sustainable urban development vision targeting the Metro Cebu, MEGA CEBU VISION 2050, in cooperation with JICA.

Following Cebu City (the Philippines), Yokohama City concluded the “Memorandum of Understanding on Technical Cooperation for Sustainable Urban Development” with Da Nang City in April 2013, based on which the City-to-City cooperation was started. Since December 2014, Yokohama has organized “Da Nang Urban Development Forum” under the partnership with JICA. At the forum, Yokohama has established a system to promote the development of integrated infrastructure and has built a detailed action plan while having concrete discussions with the departments involved of Da Nang City through the maximum use of know-how on urban development owned by Yokohama City. In addition, through the forum, Yokohama has also joined in the formulation of an urban development action plan for Da Nang. In response to the completion of the urban development action plan, the “Memorandum of Understanding on Technical Cooperation for Sustainable Urban Development” was renewed⁷ by adding new cooperative fields in the promotion of private investment in order to further deepen the City-to-City cooperation between the two cities in March 2016.

⁵Yokohama City’s “Yokohama Partnership of Resources and Technologies (Y-PORT)”
https://www.iges.or.jp/files/research/climate-energy/PDF/.../PM_6_hashimoto.pdf

⁶Yokohama City concluded a comprehensive partnership agreement with JICA on October 25, 2011 as the first local government in Japan.

⁷From the material of a press release by Yokohama (March 24, 2016)
<http://www.city.yokohama.lg.jp/kokusai/yport/pdf/160324press.pdf>

Table2 Outline of the Past Da Nang Urban Development Forums⁸

Number of Times (Year and Month)	Place
First (December 2014)	Da Nang, Vietnam
Second (May 2015)	Da Nang, Vietnam
Third (August 2015)	Yokohama, Japan
Fourth (December 2015)	Da Nang, Vietnam
Fifth (December 2016)	Da Nang, Vietnam
Sixth (June 2017)	Yokohama, Japan
Seventh (December 2017) ⁹	Da Nang, Vietnam

Table3 Detailed Cooperation between Yokohama City and Da Nang City (After the Renewal of the MOU)¹⁰

Details	
1.	Yokohama shall provide technological advice for Da Nang which aims to be an environmental city.
2.	Yokohama and Da Nang shall invite private and academic institutions that have expertise and experience in ecofriendly urban development to participate in the activities in order to achieve the above-mentioned goal.
3.	Yokohama and Da Nang shall call on their governments and each international institution so as to obtain proper support in implementing technological cooperation.
4.	Yokohama and Da Nang shall encourage private investment in their cities. As part of that activity, Yokohama shall cooperate in developing an ecofriendly industrial complex in Da Nang.
5.	Yokohama and Da Nang shall designate their point of contacts (POCs) to exchange information for further interaction in various fields in the future. POC for Da Nang shall be the Department of Planning and Investment while POC for Yokohama shall be the Development Cooperation Department, International Affairs Bureau.

Furthermore, as part of the “Support for Japanese SME Overseas Business Development” by the Ministry of Foreign Affairs and JICA, the GHG emissions reduction project was formed in collaboration with small and medium-sized enterprises (SMEs) in Yokohama where Osumi Co., Ltd. conducted simplified energy saving diagnoses for dozens of private factories in Da Nang and detailed ones for several national enterprises. Through these activities, energy saving technologies were disseminated in Da Nang by preparing the “Manual for Energy-Saving Assessments.” In addition, the representative office of the Foreign Affairs Department of Da Nang City was opened in Yokohama to securely promote mutual cooperation.

As principles for City-to-City cooperation, Yokohama focuses on integrated cooperation covering several urban fields of transportation, clean water/sewage, urban development and climate change measures to be implemented with an overseas city, promotion in cooperation with private enterprises

⁸ The first through the fourth forums were held as a JICA project, but the fifth forum and thereafter took place under the partnership between the two cities. The eighth forum will be held in Da Nang, Vietnam around July 2018.

⁹ 31 people of 19 companies mainly from Yokohama participated in the forum to discuss the four main topics of energy saving, industrial complex development, waste and port redevelopment.

¹⁰ From the material of a press release by Yokohama (March 24, 2016): <http://www.city.yokohama.lg.jp/kokusai/yport/pdf/160324press.pdf>

in Yokohama, and active introduction of resources from the national government and other donors by Yokohama. Yokohama intends to steadily proceed with the City-to-City cooperation project with the four cities. For Da Nang, cooperation on energy saving for the two cities in the academic field is expected between Yokohama National University and the University of Da Nang, University of Technology.

1.3.3.2. City-to-City Cooperation Projects between Yokohama City and Da Nang City Supported by the Ministry of Environment and Their Progress

The Ministry of Environment supported the City-to-City cooperation between Yokohama and Da Nang through the “Feasibility Studies on JCM Projects towards Environmentally Sustainable Cities in Asia in FY 2015 (JCM Feasibility Study in Da Nang through ‘Technical Cooperation for Sustainable Urban Development’ with Yokohama City)”. In this project, a “Needs Assessment” and “Water Supply Study” were conducted in relation to the introduction of low-carbon equipment in Da Nang.

As for the program, an application for the Financing Programme for JCM Model Projects with deteriorated pumps to be renewed at CauDo and San Bay water treatment plants in Da Nang was attempted. During the survey, detailed design for project realization, amounts of reduced CO₂ and power consumption, and cost-benefit analysis were considered. Under the partnership between the two cities, Yokohama and Da Nang focused on enhancing common understanding of the schedules and proceedings of the schedules and proceedings of the Financing Programme for JCM Model Projects.

As the second pillar of the feasibility study program for JCM project formation under the partnership of the two cities, a “Needs Assessment” was conducted. Through interviews with business operators, factory/hotel/building owners, and industrial complex administrators, analysis of the local needs has done. Furthermore, matching with low-carbon technologies and solutions owned by enterprises in Yokohama and other cities was made. Through the first mission, needs were confirmed for industrial processes at factories (textile, seafood processing, paper manufacturing, food), energy-saving freezers/refrigerators in cold chains, highly efficient air conditioners at hotels etc., energy saving lighting, highly efficient hot-water supply systems, highly efficient pumps, low-carbon boilers, and solar photovoltaic power generation. In the second mission, a “workshop on JCM project formulation and implementation” was organized for business operators in Da Nang to share knowledge to any necessary upgrading of equipments for reducing carbon emissions. In addition

to overviewing JCM, low-carbon technologies suitable for the Financing Programme for JCM Model Projects were introduced.

In this survey, interviews were made with stakeholders actively involved in the above projects based on seven key questions. The interviewed stakeholders were the Department of Planning and Investment (DPI) of Da Nang City, Climate Change Coordination Office of Da Nang Department of Natural Resources and Environment, Da Nang Water Supply Joint Stock Company (DAWACO), Thuan Phuoc Seafoods and Trading Corporation, Hoa Tho Textile Company, the Development Cooperation Division, Development Cooperation Department, International Affairs Bureau of Yokohama City, Mizuho Information & Research Institute Inc., Osumi Co., Ltd., and the Overseas Environmental Cooperation Center, Japan.

1.3.4. Case between Kitakyushu City and Surabaya City

Since the partnership started after the establishment of the Environmental Cooperation Network of Asian Cities in 1997, Kitakyushu City and Surabaya City have been maintaining the cooperative relationship for more than 20 years. In November 2012, they concluded a memorandum of understanding on green sister-city affiliation, and many partnership projects have been implemented under their cooperative relationship. The department in charge of Kitakyushu City is the Kitakyushu Asian Center for Low Carbon Society, International Environmental Strategies Department, and Environment Bureau while that of Surabaya City is the Cooperation Division.

In recent initiatives, based on the MOU, energy saving, waste, drinking water, and environmental sanitation projects were deployed with a focus on the formulation of comprehensive urban development plan. As one of the approaches to realize a project aiming for the establishment of a green city import model, utilization of JCM has been considered. So far, in Surabaya and its neighboring cities, the following projects have been implemented under the Financing Programme for JCM Model Projects: 1) Power Generation by Waste Heat Recovery in Cement Industry by JFE Engineering Corporation (the equipment subsidy program in FY 2014); 2) Reducing GHG Emission at Textile Factories By Upgrading to Air-saving Loom by Toray Industries, Inc.(the equipment subsidy program in FY 2014; one of the three textile mills was located in East Java Province); 3) Energy Saving for Air-Conditioning at Shopping Mall with High Efficiency Centrifugal Chiller by NTT Facilities (the equipment subsidy program in FY 2015). Among them, the framework for the partnership project between the two cities was used for 3) mentioned above.. This project was considered and implemented after the following JCM Feasibility studies on Environmentally Sustainable Cities in Asia by the Ministry of Environment from FY 2013 to FY 2015

1.3.4.1. Overview of the City-to-City Cooperation between Kitakyushu City and Surabaya City

In June 2010, Kitakyushu City opened the “Kitakyushu Asian Center for Low Carbon Society” to promote low-carbon activities in Asia related with environmental sector particularly on environmental technologies. Since then, Kitakyushu City has aimed to utilize local resources and revitalize local communities through the support of enterprises in Kitakyushu in developing environmental business overseas by making use of the accumulated environmental technologies for overcoming pollution and for use in the manufacturing processes; and utilizing the established City-to-City cooperation networks. Kitakyushu has been also working on the reduction of CO₂, mitigation of contamination, and enhancement of living quality in Asian cities¹¹. For the development of such initiatives, Kitakyushu tries to effectively and efficiently proceed with the formulation of master plans toward green urban development and the export of packaged urban infrastructure and environmental technologies through the City-to-City and inter-government cooperation, and partnerships with international institutions.

As one of the features of this center, the International Environmental Strategies Department, Environment Bureau, the Kitakyushu International Techno-cooperative Association (KITA), and the Institute for Global Environmental Strategies (IGES) are centralized in the same place, where the center is jointly operated under their partnership. The center develops business by linking functions of technological export, HR development, and research & study through the partnership. In addition, the center also has close partnerships with the Kitakyushu Interdependent Business Consortium for Sustainable Development (KICS), a network for environmental enterprises, and the Kyushu Renewal Energy and Environmental Industry Promotion Association (K-RIP).

Under these systems, the center implements 154 projects in collaboration with more than 106 Japanese enterprises in 57 cities of 14 Asian countries. The total amount of these projects exceeds 10 billion yen¹².

¹¹From the brochure of the Kitakyushu Asian Center for Low Carbon Society
http://www.asiangreencamp.net/pamphlet_j.pdf

¹²From the urban development plan aiming to be the “world environmental capital” (regarding the initiatives for international environmental cooperation and business) by the Environmental Bureau of the Kitakyushu Municipal Government

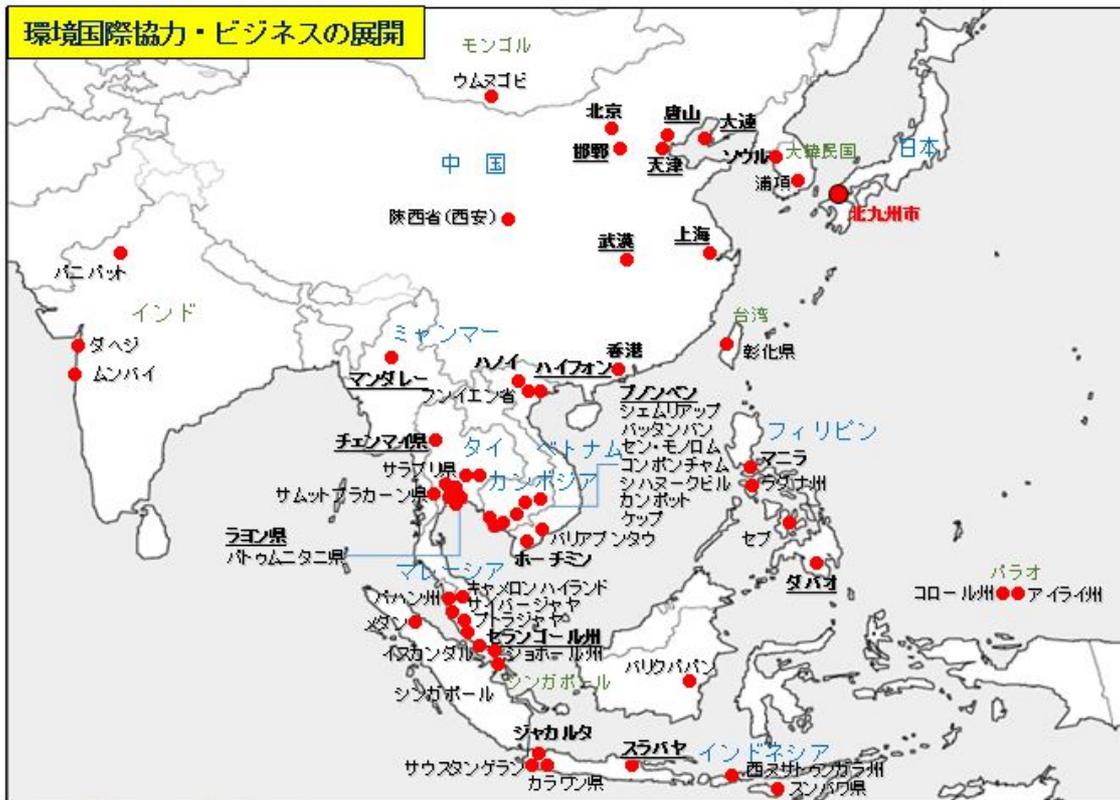


Figure. 1 Development of Environmental International Cooperation and Business by Kitakyushu City (Source: Kitakyushu City)

Particularly, in Indonesia, 33 projects have been implemented, 21 of which were for Surabaya City¹³. In November 2012, Kitakyushu and Surabaya concluded a memorandum of understanding on green sister-city affiliation. Regarding “Export of Green City Program” to Surabaya City, Indonesia (as one of the core projects), Kitakyushu promotes the support for creating comprehensive social infrastructure by developing various projects including the establishment of social systems and the change of civil consciousness in fields of waste, water & sewerage and energy. The center smoothly implements these projects by partially utilizing financial assistance from JICA, the Ministry of Environment, the Ministry of Economy, Trade and Industry, and the Ministry of Foreign Affairs¹⁴. A major project with which the center has been proceeding in Surabaya since 2012 is the waste recycle-based project for intermediate processing and composting. In this project, household refuse is collected, sorted and recycled for the reduction of refuse in Surabaya. On March 8, 2013, a “Super Depo (recycle-based intermediate processing facility)” was constructed to sell composted organic material. The center aims to commercialize the project in Indonesia by concluding a

¹³From the slide “Kitakyushu’s initiatives for the realization of low carbon in Asia: Activities in Indonesia”

¹⁴From the slide “Support for environmental business in Asia under the inter-city cooperation”

https://www.iges.or.jp/files/research/climate-energy/PDF/20131022/PM_4_kitakyu_ishida.pdf

memorandum of understanding for cooperation with a state-operated fertilizer company in Indonesia.

Transition of city-to-city cooperation between Surabaya city and Kitakyushu City

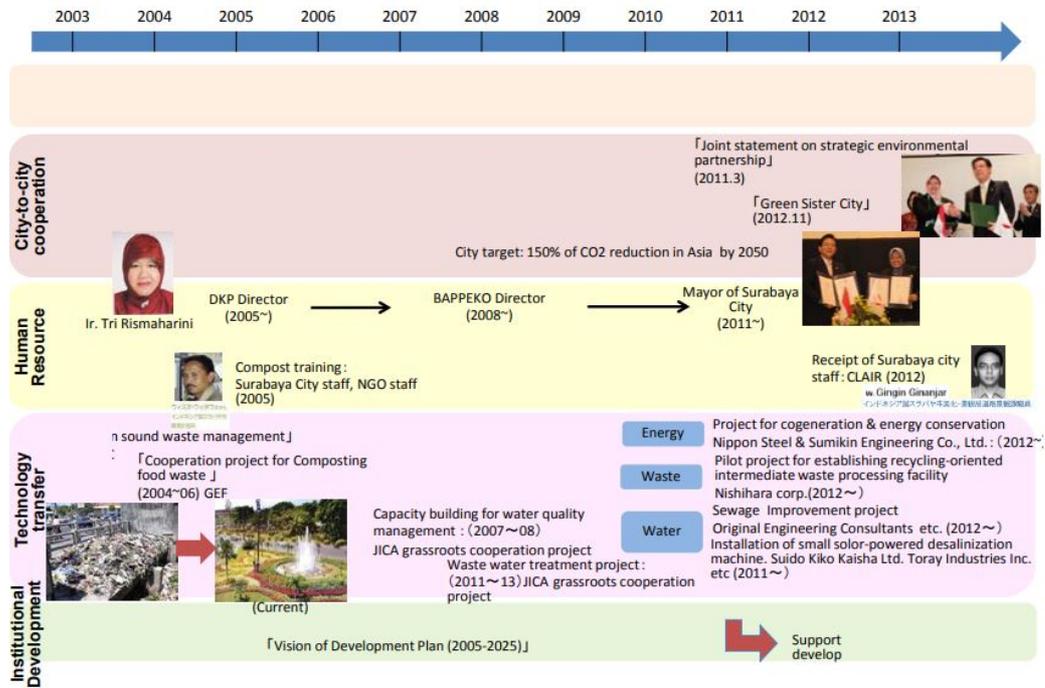


Figure.2 Background of the Cooperative Relationship between Surabaya City and Kitakyushu City (Source: Kitakyushu City)



Figure.3 City-to-City Cooperation between Kitakyushu City and Surabaya City (Source: Kitakyushu Asian Center for Low Carbon Society)

(Partially added or corrected)

1.3.4.2. City-to-City Cooperation Projects between Kitakyushu City and Surabaya City Supported by the Ministry of Environment and Their Progress

In August 2013, Japan and Indonesia agreed on the bilateral document regarding JCM (Joint Crediting Mechanism). For three years from FY 2013 through FY 2015, the Ministry of Environment supported the City-to-City cooperation projects between Kitakyushu City and Surabaya City through the Feasibility Studies on JCM Projects towards Environmentally Sustainable Cities in Asia (the Technical Assistance for Designing a Low Carbon City Plan in Surabaya, Indonesia in FY 2013; the Low Carbon City Planning Project in Surabaya, Indonesia in FY 2014; Establishment of Base for Low-carbon Project Expansion in Surabaya in FY 2015).

In this project, a survey of potential reduction of GHG emissions in the four fields of energy, traffic, waste and water resources was conducted in the first year, with the aim of submitting an application for the Financing Programme for JCM Model Projects. In the second year, focus was placed on the two fields of energy and waste due to their high feasibility and cost-effectiveness in the reduction of CO₂ emissions, and cultivation of potential JCM projects, establishment of a monitoring system, encouraging the institutions and agencies involved to adopt systems and policies required for expansion and support for the formulation of low-carbon city plan were conducted. In the energy field, cogeneration systems were introduced to industrial complexes, dispersion-type power sources were installed in buildings and structures, and energy saving activities were conducted. In the waste field, considerations were made for sorting/recycling/composting, power generation with incineration heat, and converting a cement source into fuel. In the final year, succeeding to these, activities to promote or expand realization of the considered projects were conducted. As a result, energy saving for air conditioning systems with highly efficient centrifugal chiller at commercial facilities was adopted under the Financing Programme for JCM Model Projects in FY 2015 as the first project in Surabaya of this program. At present, the air conditioning systems installed in the facilities work smoothly.

In addition, several workshops were organized in Surabaya attracting agencies involved and local enterprises for the potential development of JCM.

In this survey, interviews were conducted with stakeholders who played leading roles in the above-mentioned projects and in the framework of the City-to-City cooperation. They are the Kitakyushu Asian Center for Low Carbon Society, IGES, Ishikawa Engineering Co., Ltd., Nishihara Corporation, Amita Holdings Co., Ltd., NTT Data Institute of Management Consulting, Inc., JCM Indonesia Secretariat, PT. Pakuwon Jati Tbk, Semen Indonesia, Sheraton Hotel Surabaya, Surabaya

City Hall (Cooperation division and other related divisions),, the Coordinating Ministry for Economic Affairs of Indonesia, Jakarta Office of NTT Facilities, and PLIB, a B3 waste license company.

1.4 Conclusion and Suggestions

1.4.1 Conclusion

In the three areas subject to this survey, interviews were conducted based on seven key questions. The key points disclosed through the interviews are summarized as follows according to each key question.

1. Has the city established its Low Carbon Plan or Action Plan? How far it is progressing and at what degree.

The roles of the Japanese local government in the City-to-City cooperation project are as follows: (1) cooperation in policy formation, formulation of regulations and standards, and policy making to create enabling environment for the wide implementation of the low-carbon project; (2) creation of match making opportunities among private enterprises for mutual cooperation; and (3) promotion of concrete low-carbon/carbon reduction projects. The Indonesian government and the Bangkok Metropolitan Administration reflected the recognition of effectiveness of the City-to-City cooperation project in drawing up or implementing their low-carbon plans.

On the other hand, Japanese cities involved in projects recognized that (2), matching of enterprises and (3), implementation of the project later are more important from the perspectives of municipal industrial development and taking attraction of citizens and the municipal assembly than (1), creation of an environment despite the understanding that it is one of the objectives of the City-to-City cooperation project. As observed, Kitakyushu City and Yokohama City regard (1) creation of an environment as an effective preparation for (2) and (3), and these are promoted synergistically. Concretely, a business model is adopted where the low-carbon project is regarded and implemented as a flagship in the City-to-City cooperation among the comprehensive environmental countermeasure plans formulated in the partner city¹⁵. Based on the experience in Surabaya City, Kitakyushu City thinks that it is important to develop low-carbon planning before matching enterprises of the two cities, which allows the City-to-City cooperation to be developed not only as matching enterprises of the two cities, “a project connecting two points,” but also “a project

¹⁵Cooperation provided by supporting institutions in Europe and the United States also focuses on the creation of low-carbon technology markets while the inter-city cooperation provided by Japanese municipal governments emphasizes the implementation of individual problem-solving projects.

connecting two faces” to proceed with countermeasures using policies and projects as a tandem of the City-to-City cooperation.

In the case of the Bangkok Metropolitan Administration, which is actively implementing its climate change master plan, Yokohama City continues to organize seminars for training personnels in Japan and dispatch the educated personnels to the working groups in their country. Involving the departments concerned in the five fields of the master plan in Yokohama, “Team Bangkok” was also organized. In the case of Da Nang City, whose needs for low carbon are not necessarily high, carbon emission inventories have begun to be prepared finally. (1), (2) and (3) have not been properly linked. The Financing Programme for JCM Model Projects for the Da Nang Water Supply Joint Stock Company (DAWACO) referred to later succeeded as a single energy saving project resulted from a potential survey.

(1) Making enabling environment where low-carbon projects are widely implemented

Low-carbon planning is often developed as part of the overall development plan of a city, and cooperation in such formulation is often provided as a JICA project. As for the three projects assessed this time, planning for the environment or development in Bangkok and Da Nang City in general is being drawn up as JICA’s cooperation projects in which Yokohama City participates. Also in the three areas this time, the projects were implemented smoothly and efficiently in collaboration with JICA’s various projects. In light of these cases, it would be difficult to support the formulation of low-carbon planning under the City-to-City cooperation project by the Ministry of Environment alone. For Surabaya City, although planning was not conducted yet, cooperation in establishing a green building commendation system was provided as part of the City-to-City cooperation project. It would be sufficiently contributable to develop systems and standards contributing to the introduction of low-carbon projects under the City-to-City cooperation project alone.

(2) Business matching

Many of the Japanese enterprises emphasized the significance of business matching under the framework of the City-to-City cooperation. It was highly regarded that cooperation under the partnership between the two cities was particularly essential for the Japanese enterprises expecting collaboration with the public sector of the partner country. In addition, some enterprises said that local workshops made a proper opportunity for unknown Japanese enterprises to introduce themselves in the partner countries. Some also mentioned that it would be important to provide an opportunity for interested enterprises to continue their discussions after the workshop and perform follow-up. Some also suggested that it would be useful to support the SMEs’ development of their

strategies for the effective use of business matching opportunities by the Japanese local government prior to their visit. It is because planning good strategies for business development in the partner countries is an issue for many SMEs.

2. Were the capacity building activities conducted in the past city-to-city cooperation effective?
(impact/effectiveness of capacity building activities)

As cooperative fields under the City-to-City cooperation project, urban issues such as waste, water/sewerage and traffic were prioritized by the partner country cities. As a result, they tended to highly esteem the cooperation achievements and capacity building in these fields.

On the other hand, regarding the first objective as ‘creation of an environment where low-carbon projects are implemented’, Bangkok concluded that workshops under the support of City-to-City cooperation were effective for drafting a master plan while Surabaya and Da Nang Cities did not refer to any specific outcomes of capacity building in creation of environment through partnership¹⁶. The Coordinating Ministry for Economic Affairs in Indonesia expects that the capacity of low-carbon development will be enhanced in Indonesian cities through the City-to-City cooperation¹⁷.

The results of capacity building after the business matching of 1. (2) were assessed differently in the three areas. Surabaya City highly valued the model project for sorting and processing of waste by private business operators in Kitakyushu City (JICA project), which remarkably contributed to capacity building there, as a project to supporting the implementation of SDGs in Surabaya. On the other hand, the two enterprises in Da Nang City that the assessment mission team visited did not refer to contribution to capacity building. The reasons for this might be as follows: (1) the team had to collect information from them and explain about JCM through an interpreter in a limited time and number of visits; (2) mismatching between the technologies offered by Japanese enterprises and those expected by the partner countries. In Bangkok, there were some unsuccessful cases due to factors not related to capacity building, where the consultation stopped due to replacement of the local responsible person although the consultation and preparations for realization of a JCM project proceeded between Japanese and local enterprises, and where a competitive enterprise joined in the final stage of project formation, which prevented the realization as a JCM project. In Bangkok, the second stage of master plan development was started, and the launch meeting was held in January

¹⁶In Da Nang, a comprehensive environmental plan was separately drawn up in cooperation with JICA, involving Yokohama.

¹⁷The JCM secretariat in Indonesia thinks that inter-city cooperation projects are effective for capacity building toward the urban low-carbon development, and the success should not be evaluated by the number of projects realized under the JCM program in 1.(3).

2018 attended by the parties involved from Japan and Thailand. Toward the implementation of the master plan, 5-year capacity building is scheduled including the dispatch of experts and training seminars in Japan. The Bangkok Metropolitan Administration will establish the Climate Change Department to assign a responsible person.

As for promotion of the JCM project explained in 1. (3), Kitakyushu and Yokohama Cities held local workshops, which the staff of the partner municipal governments and private enterprises attended. Both the Japanese and the partner sides evaluated the workshops where the focus was the significance of realization of low-carbon societies, detailed technologies required for low-carbon societies were shown, and productive capacity building was implemented for deep understanding of JCM. Surabaya and Da Nang Cities, where the Financing Programme for JCM Model Projects was conducted, valued that the capacity building conducted under JCM projects had helped them significantly in the formation process. The private enterprises in Surabaya City, where the Financing Programme for JCM Model Projects was implemented, fully understood the significance of energy saving investment with a decision to promote the replacement with LEDs and install solar panels by themselves, in addition to the program related to highly efficient air conditioning equipment. The Thailand Greenhouse Gas Management Organization(TGO) stated that the JCM methodology and capacity building on Measurement, Reporting and Verification (MRV) were effective.

Furthermore, as part of the City-to-City cooperation, training seminars were held in Japan. Kitakyushu City organizes the seminars in collaboration with the local JICA training center while Yokohama City annually holds the Da Nang urban development forum. Yokohama City also offered training seminars for organizations and enterprises in Bangkok to introduce Japanese equipment and technologies mainly at the facilities in Yokohama. These training seminars were highly esteemed by the partner countries. Although it is somewhat difficult to apply Japanese energy saving technologies directly to overseas countries, both the partner countries and Japan pointed out the importance of hearing and seeing how these technologies were actually used. In addition, inviting the stakeholders to Japan resulted in promoting their understanding that JCM was a program by the Japanese government and in building credibility for JCM.

3. What is the progress of project formulation and the status of application and adoption of JCM Model Project?

1) Progress in realization under the Financing Programme for JCM Model Projects

Under the Financing Programme for JCM Model Projects, one project was realized each in Da Nang and Surabaya Cities, and they have been working smoothly. The business operators in the two cities appreciate each project.

This time, almost every interviewee regards the Financing Programme for JCM Model Projects as an effective solution to “high initial cost,” a barrier to introducing Japanese technologies, as well as one of the important tools to implement low-carbon projects in developing countries. The Financing Programme for JCM Model Projects was not conducted under the City-to-City cooperation project with Bangkok¹⁸. In Da Nang, as a result of the City-to-City cooperation project, the introduction of highly efficient pumps by DAWACO, a public sector in Da Nang, was realized under the Financing Programme for JCM Model Projects. DAWACO values the results of the said Financing Programme for JCM Model Projects and thinks that the possibility of the introduction to water suppliers in other cities would be high. Yokohama intends to proactively publicize the program since it is one of the few successful cases in the public field, and it is possible to develop it in other cities. Even after the completion of the project by the Ministry of Environment, Yokohama is looking for projects that may be realized as the Financing Programme for JCM Model Projects under its own City-to-City cooperation by listing energy saving projects at hotels and factories. Yokohama expects the utilization of the City-to-City cooperation project by the Ministry of Environment again in the near future. In Surabaya, the introduction of highly efficient air conditioning equipment to a shopping mall as cooperation between private enterprises was realized under the Financing Programme for JCM Model Projects. That enterprise appreciates the results of the JCM project, indicating its intention that a similar Financing Programme for JCM Model Projects would be applied to the other three buildings of its affiliate. The Department of Planning and Investment (DPI) in Da Nang City shows interest in project formation under the Financing Programme for JCM Model Projects through the cooperation between the private enterprises as the next step.

2) Challenges of using JCM in the public sector

(1) Procurement system (Competitive bidding)

The largest problem in realizing a project in the public sector under the Financing Programme for JCM Model Projects is the procurement system of the partner country. In light of the Financing Programme for JCM Model Projects as a bilateral system with subsidies, some flexibility worked in

¹⁸The number of projects registered as JCM in Thailand is only one as of the end of 2017.

Vietnam while realization under the Financing Programme for JCM Model Projects preconditioning specific technologies was regarded as difficult in Thailand and Indonesia since competitive bidding based on the price is indispensable for procurement in the public sector. In Indonesia, the transfer of any facility requires a permit or approval from the central government, the proceedings of which are complicated. Surabaya City considers it as a major barrier to realization of the JCM projects under public sector.

(2) Service-related projects in the waste and water/sewerage sectors

In the case of the public sector, project needs are high in the waste and water/sewerage sectors. In some cases, however, realization under the Financing Programme for JCM Model Projects was relinquished since the effects of CO₂ reduction are not always high in these fields, and it is not easy to apply the financing programme to the project focusing on the provision of service¹⁹. According to the Global Environment Centre Foundation (GEC), an institution implementing the Financing Programme for JCM Model Projects, reduction cost against total GHG is also assessed in selecting a project subject to the Financing Programme for JCM Model Projects. None of the interviewees knew about this fact this time.

3) Challenges of JCM under private to private cooperation

As for the specific issues related to the cooperation between private enterprises, the following were pointed out: (1) Credibility of enterprises in the partner country; (2) Understanding capability of enterprises in the partner country; (3) Local regulations; (4) Life cycle of products; and (5) Securing initial investment cost. Particularly, the local regulation issues in Indonesia are expected to affect the progress of the JCM project greatly in the future and a prompt inter-government dialog is required.

(1) Credibility of enterprises in the partner country

In the case of general enterprises in the developing country excluding public or listed ones, they occasionally showed reluctance to disclosure of their financial statements or had multiple financial statements, causing problems in giving credit. This issue is regarded as a common problem in

¹⁹Power generation with refuse incineration using waste, which requires the construction of facilities and produces a good CO₂ reduction effect, is advantageous for the realization of projects under the Financing Programme for JCM Model Projects.

choosing a SME as a partner. In fact, JCM is considered to be a system for large enterprises in Indonesia.

(2) Understanding capability of enterprises of the partner countries

For understanding of economic advantages in JCM, it is necessary to know the current energy usage, energy efficiency, and its cost. In developing countries, however, SMEs that have such capabilities are a few. For the renewal of facilities, a technology that requires the least initial investment cost is always selected.

(3) Issues resulting from local regulations

In Indonesia, it is common for electric and gas companies not to conclude a long-term contract with customers due to domestic affairs. This is one of the reasons that halted the realization of a cogeneration project under the Financing Programme for JCM Model Projects midway. According to the Jakarta office of a Japanese enterprise, recent tighter regulations by the government do not allow foreign business projects costing less than a billion yen to obtain permits or a single enterprise to engage both in design and construction. This prevents business operators from becoming a representative of the international consortium, and projects between private enterprises have not developed further under the Financing Programme for JCM Model Projects. The issue in Indonesia is serious, so a prompt inter-government dialog is required.

(4) Service life and duration of use

The Duration of service and life time of equipment could be a challenging issue when cooperation is done between private enterprises of two cities. As observed in the building sector of Surabaya City, the informal approval of using air conditioning equipment was declined in the final stage. This is because of the uncertainty about continual use of these equipments introduced under the Financing Programme for JCM Model Projects over 10 years. It was also unclear how much subsidy should be paid back if the equipment renewed before the expiration of its service life. In addition, unlike Japan, air conditioners are fully used all year round in Indonesia, so concern was expressed that the service life would be shortened there even with the same equipment.

(5) Securing of initial investment cost

Under the Financing Programme for JCM Model Projects, a maximum 50% capital investment subsidy is given, but it is necessary to secure more than 50% of the remaining initial investment cost.

In developing countries, interest rates are generally very high, and it is difficult for SMEs to secure the fund. As reference information, the cases realized under the Financing Programme for JCM Model Projects in a lease manner in Central and South Americas, involving local financial institutions, were introduced. The advantages of the lease-style project are as follows: (1) No initial investment costs are required; (2) Annual amount of payment is fixed, and it is easy to instantly understand its economic advantage; (3) No complicated proceedings are required, so the problem to secure initial investment cost can be avoided.

4) Common issues

Regardless of the public or private sector, the common issues were as follows: (1) Applicable GHGs; (2) Securement of representative of the international consortium; (3) When to introduce equipment and complicated proceedings; (4) Competitiveness of Japanese technologies; (5) Limited project scales; (6) The role of the national and municipal governments in City-to-City cooperation; (7) Publication of JCM; and (8) Personnel relocation.

(1) Applicable GHGs

Waste is a common and urgent urban policy issue. In many cases, a project to reduce the generation of methane gas is required by properly managing segregated disposal and final landfill sites besides CO₂ reduction through power generation using waste. Japanese local governments expect the JCM system to cope with such GHGs other than CO₂.

(2) Representative of the international consortium

Many of the Japanese business operators interviewed said that securement of representative business operators was an issue. Successful cases in representative business operators should be disseminated domestically in the future. The cases where becoming representative business operators is advantageous are as follows: (1) When a Japanese parent company implements a project under the Financing Programme for JCM Model Projects in cooperation with its local subsidiary; (2) When the project is regarded as a chance to gain a foothold for development of its own business there without thought of profit; (3) When maintenance and inspection of the equipment and MRV are accepted from local enterprises under separate contracts to gain profit; and (4) When the representative business operator covering most processes including construction work realizes the project under an agreement with the local enterprise whereby some percentage of the project cost is allocated as a profit with a reduction of the subsidy rate in the same percentage. Particularly in (4), it is even

necessary to prove that the cost is smaller than that of its competitive technology, but the case in Surabaya succeeded.

(3) When to introduce equipment and complicated proceedings

It takes about two years to prepare for the Financing Programme for JCM Model Projects due to its complicated procedures. Some business operators understand that this period is appropriate and required for general preparations for them while some expect that improvement should be made since good business development timing will be lost. Some also request that applications should be received periodically, not annually. Evaluation differs according to business categories. Some pointed out that for example, in Thailand, the enterprises having sufficient funds chose other domestic subsidy systems or implementation as their own projects with a focus on business timing, avoiding the complicated procedures for the Financing Programme for JCM Model Projects and the length of time required to execute it. On the other hand, some expressed their awareness that in Indonesia the Financing Programme for JCM Model Projects was suitable for large enterprises having high fund-raising capacities and management capabilities.

(4) Competitiveness of Japanese technologies

It is necessary to overcome the high costs of Japanese technologies for the development of JCM on a large scale in the future. Japanese enterprises developing business in Indonesia expressed their concern that expensive yet highly efficient Japanese technologies had allowed recovery of the initial investment balance over several years, but in recent years, the competitiveness of Japanese technologies declined due to unchanged higher costs against small differences in efficiency with other countries' technologies.

(5) Limited project scales

Referring to Financing Programme for JCM Model Projects, the scale of projects was a challenging issue. Some said that the project scale was limited, and the program was not applicable to large projects such as power generation using waste. On the other hand, some also mentioned that such projects should be realized as JICA projects or use loans from development banks, not implemented under the Financing Programme for JCM Model Projects, or the core technology should be covered by the Financing Programme for JCM Model Projects.

(6) Role of the national and municipal governments in City-to-City cooperation

As a case in Surabaya, the municipal government did not have authority over decision-making for City-to-City partnership which should be issued by the national government. In the other cases, cooperation was smoothly promoted as the national government coordinated overall coordination between partner cities and controlled credits while matching between enterprises and cultivation of projects should be handled by municipal government.

(7) Promotion of JCM

It is necessary to further disseminate the existence and mechanism of JCM to the administrative bodies and private enterprises concerned for the popularization of JCM through publications and public dissemination tools. Some said that workshops should be organized and information channels should be opened up for that purpose.

(8) Personnel relocation

As cases in Bangkok, common awareness of the issue that the progress in cooperation developed so far has slowed down due to relocation of the responsible person was shared both in the public and private sectors.

5) Measurement, Reporting and Verification (MRV)

Many of the enterprises that joined the projects under the Financing Programme for JCM Model Projects indicate that MRV is not burdensome and regarded as a matter of course. They confirmed that the data provided by MRV, analysis of the data and advice can be used for promoting the management and operation of the facilities. On the contrary, representative business operators of the international consortiums generally feel long-term MRV is overly burdensome.

6) Toward the large-scale development in the future

The Coordinating Ministry for Economic Affairs in Indonesia welcomes the policy of the Japanese government that JCM will be expanded under the commitment of the Paris Agreement. On the other hand, the Ministry expresses deep concern about a reduction in the budget of the Financing Programme for JCM Model Projects. The Ministry has pointed out that fewer models would prevent full deployment even in other approaches although they understand well that the equipment subsidy program is a model project.

Many of the stakeholders think that there may be some schemes where selling and buying emission reduction credits work as an incentive similar to Clean Development Mechanism in large-scale deployment. If emission reduction credits work as an incentive, JCM will be able to use them even for service-related projects other than facility construction types without being confined to CO₂.

Some people pointed out that in that case, available credits would be underestimated due to the current very conservative methodology, which would not result in an apparent decline in the CO₂ reduction cost per ton. As for the credits available from the Financing Programme for JCM Model Projects, both Vietnam and Indonesia confirmed that using credits by private enterprises was not specified yet since there were no domestic carbon markets and voluntary dealing systems yet.

As for Bangkok, some Japanese enterprises said that it might be possible to realize the initiatives to optimize the energy efficiency and allocation in the area, like the concept of a smart city, as energy-saving projects, which did not exist there previously. Some also mentioned that in Vietnam and Thailand, where agriculture is the core industry, the potentials of biomass power generation and thermal usage would be high.

4. Did the city involved in any similar initiatives other than Japan?

The Coordinating Ministry for Economic Affairs in Indonesia, and the Department of Planning and Investment (DPI) in Da Nang use low-interest loans provided by international development institutions such as the World Bank for initiatives on low-carbon technological transfer.

Compared to these, Japan's Financing Programme for JCM Model Projects, which directly provides subsidies for enterprises, is unique, and is regarded as very attractive in implementing individual projects. However, there are some cases where realization under the Financing Programme for JCM Model Projects was attempted but other country's technology was ultimately introduced due to the above-mentioned diverse issues. In Bangkok, the subsidy of the Ministry of Energy and the tax holiday incentive of the Office of the Board of Investment were referred to as competitive systems for energy-saving investment.

5. How can these initiatives be further developed or progressed?

1) Positioning in the overall package

Both Kitakyushu and Yokohama implement their City-to-City cooperation by combining diverse funding sources well. For example, Surabaya feels the partnership between the two

cities has not changed even after the completion of City-to-City cooperation project by the Ministry of Environment (MOE) in FY 2015. This is because Kitakyushu conducts comprehensively the City-to-City cooperation by using its own subsidy program, JICA's grassroots technical cooperation projects, JICA's feasibility survey program, JICA's Support for Japanese SMEs Overseas Business Development, and the program of the Ministry of Economy, Trade and Industry in promoting the cooperation between the two cities. In fact, Kitakyushu has acquired more than 10 billion yen of the project cost from the outside during eight years for smooth City-to-City cooperation. The situation has been clarified that the features of the City-to-City cooperation project by MOE are fully made use of and its objectives are fulfilled.

On the other hand, some people said that it was considerably difficult to produce tangible results through the MOE's single-year City-to-City cooperation project itself since the period required to conduct the project is substantially short (from July through February in the next year), and duration of every business trip is also limited within a week. For example, realization of the project for DAWACO in Da Nang succeeded under the Financing Programme for JCM Model Projects, but the time taken for cultivation of other potential private enterprises was insufficient.

2) Problem-solving approach

After understanding the partner city's needs, both Kitakyushu and Yokohama adopt "problem-solving approaches" by creating an environment with established systematic plans and policies, and proposing detailed projects as a tandem approach. As a result, response to typical urban issues such as waste and water/sewerage, which the partner city prioritizes, is often requested. On the contrary, the needs of CO₂reduction for a low-carbon society are not high in the partner city, so realization of the project succeeds in the context of cost reduction by energy saving.

3) Incentives for realization under the Financing Programme for JCM Model Projects

As for the promotion of the Financing Programme for JCM Model Projects realization through the City-to-City cooperation project, there is a possibility that the enterprises involved in the feasibility study (FS), the failure risks of which are few, may lack from the adequate incentives to succeed under the Financing Programme for JCM Model Projects. In this survey, however, the motivation of the Japanese private enterprise involved was highly esteemed in the cases where realization under the Financing Programme for JCM Model Projects succeeded..

The emergence of the above-mentioned various problems resulted in the failure in the other unsuccessful cases of JCM financed Model projects. It has been shown that the JCM system continues to be an attractive option to private enterprises in the case of transferring Japanese technologies to developing countries.

4) Private support

Kitakyushu City understands that the MOE's City-to-City cooperation project played a key role to implement City-to-City cooperation for low-carbon development in a package. Private enterprises involved in the City-to-City cooperation project evaluate it as a very useful scheme in looking for business opportunities in unknown overseas countries. For large enterprises, subsidies for traveling costs were not very important, but facilitation in contacting the local government departments and private enterprises under the framework of the City-to-City cooperation was more considerable. For SMEs, support for traveling costs was also indispensable.

5) How to implement projects

The Coordinating Ministry for Economic Affairs in Indonesia expects that JCM projects will be promoted more proactively under the City-to-City cooperation based on the premise of close coordination with the JCM Secretariat. As seen, the central government in Indonesia interested in sharing information and knowledge on details of the City-to-City cooperation project because of its lacking in information and data on projects implementation as a barrier facing now.

6. Are there any potential for co-benefit with aligning the local issues with the SDGs and contributing to it through the city-to-city cooperation?

Indonesia has two systems of Sustainable Development Implementation Plan (SDIP) and Sustainable Development Implementation Report (SDIR). The Financing Programme for JCM Model Projects will also be properly positioned under these systems, not for CO₂ reduction only. The Coordinating Ministry for Economic Affairs is certain that there is a large possibility of linkage between JCM and the Sustainable Development Goals (SDGs). The Ministry expects that the linkage with the SDGs will be strengthened by transferring the Ministry in charge of JCM from the Coordinating Ministry for Economic Affairs to the Ministry of Environment and Forestry in the early stage in the future.

Both Yokohama and Kitakyushu think that the linkage with the SDGs is a future issue should be addressed. For example, as for water projects, the importance of reduction of the water leakage, effective use of water, and conservation of energy make opportunities for many people to use affluent water at lower prices. Regarding traffic, it is necessary to construct a public transportation facility required for commuters while developing a large-scale industrial complex. This issue not only associated with energy saving but also connected to the SDGs. Concerning waste, it is an issue to generate power with urban refuse, which should be sorted and recycled. It is also possible to provide employment for scavengers in these processes. Contributions to developing countermeasures against dengue fever and malaria have being started by using technologies of local enterprises.

As for renewable energy, it is possible to link it with various goals such as the SDGs by introducing it into isolated islands as a dispersion-type power source. Kitakyushu is considering its introduction to remote islands in Indonesia. Indonesia is an island nation with numerous islands having no electricity, and construction of facilities such as power distribution installations (electric poles and wires) is required, increasing the cost as a project barrier.

7. Other matters that should be considered for the improvements of the future city-to-city cooperation.

1) Role sharing between the national and local governments

For smooth implementation of projects, it is important to clarify the roles shared by the national and local governments on both sides in the developing country. The JCM joint committee deals in overall coordination at the national level while the municipal government handles concrete business matching and MRV.

2) Centralization of the urban channels in the developing country

Centralization of urban planning channels as an interconnecting system in the developing country is effective. In the case of Da Nang, the Department of Planning and Investment, the head department, became the primary point of contact at the beginning of cooperation, which resulted in smooth coordination with other departments.

3) Collaboration with other frameworks

Collaboration with other frameworks such as JICA's feasibility survey for Support of Japanese SMEs Overseas Business Development is also functional. In the case of DAWACO,

an energy-saving diagnosis was made under JICA's dissemination and implementation program followed by participation in the Financing Programme for JCM Model Projects under the City-to-City cooperation project.

4) Support from citizens and the municipal assembly

Both Kitakyushu and Yokohama Cities appreciate the City-to-City cooperation: the municipal assembly values industrial development through overseas advance by local enterprises and acquisition of outside funds other than the municipal government's budget. Overseas expansion not only by large enterprises but also by SMEs is also highly esteemed. Citizens support the international cooperation, taking pride in achieving their city name recognition and contributing to partner cities. Site visits by members of the assembly and high school students are also useful for better understanding and enhance public awareness.

5) Initiatives by incorporated associations

A general incorporated association, "Yokohama Urban Solution Alliance (YUSA)," was established mainly by private enterprises having their bases in Yokohama as a platform to promote business negotiations with overseas enterprises in cooperation. In January 2018, YUSA concluded a contract with a local enterprise developing and operating industrial complexes in Thailand, which has attracted attention as a mechanism to develop Japanese low-carbon technologies overseas.

1.4.2 Suggestions

1) Promotion of the City-to-City cooperation projects

(1) Securement of flexibility in project objectives

At present, the substantial objectives of the City-to-City cooperation project are as follows: (1) creating an enabling environment for diffusing and implementing low-carbon projects such as low-carbon planning; (2) developing matching mechanisms between individual enterprises; and (3) formation of JCM projects. However, how these objectives have been fulfilled is not necessarily reported clearly as project outcomes. Clarifying the outcomes of the City-to-City cooperation project is expected in the future.

Referring to increase the number of City-to-City cooperation projects, it is necessary to design the system for evolvement of diverse cities under the precondition that Japanese partner cities

would be expanded according to the administrative capabilities of the cities or based not on industry but on agriculture from top environmental cities such as Kitakyushu and Yokohama to other cities while the overseas partner cities would be expanded according to the administrative capabilities of the cities or based not on industry but on agriculture from capitals and large cities to small and medium-sized cities.

Although the achievement of all the three objectives would be required, but securing the project effectiveness is a key issue should be addressed. Accordingly, it would be beneficial to encourage flexibility to choose the objectives that would be feasible on a case-by-case basis. For example, under the cooperation between the large cities with high performance capabilities, it is desirable to create an environment where the partner city voluntarily promotes GHG reductions. To facilitate this approach, the establishment of a system to report emission reduction should be integrated as the first step to start the climate change policy. Also, development of low-carbon town planning in response to the local needs based on the experience of the Japanese local government should be supported. Furthermore, the expertise to formulate guidelines and implementation methods for the reduction of emissions at factories and offices should be transferred. On the other hand, for cooperation with small and medium-sized cities, formulation of low-carbon planning should be excluded from the goals, and it would be more acceptable to focus on the formation of individual problem-solving projects from the beginning as an effective option. Or the lateral expansion of the JCM project expected highly by the partner city might be regarded as an objective of the project.

As for the formation of the JCM project in (3), it should be noted that focusing on initiatives in the public sector such as waste, clean water, sewerage, ports & harbors, airports, schools and hospitals under the City-to-City cooperation, the project outcomes are more sensible in general. For the introduction of technologies from private enterprises, it is necessary not to depend only on technologies owned by the enterprises located in the Japanese partner city but to flexibly involve outside enterprises like Kitakyushu for exploiting major opportunities. From the perspective of exploring environmental infrastructure, project boosters might be financing not only by JICA but also by support of Japan Bank for International Cooperation (JBIC). As observed in the case of Surabaya, during FS of a large-scale project such as power generation from refuse, although consideration was made under the condition conducted in overall as a JICA project but the core technological transfer should be realized under the Financing Programme for JCM Model Projects.

(2) Approach from the “upper stream” for success of the project

In many cases, low-carbon planning is formulated as part of the overall development plan of the city as it would generally be difficult to support the formulation of a low-carbon plan under the City-to-City cooperation project alone. Such cooperation is often implemented as a JICA project. On the other hand, it would be a realistic approach to make a proposal by incorporating an individual project under the Financing Programme for JCM Model Projects in the specific low-carbon project plan which drawn up under the general development plan or the environmental plan. In fact, this survey has disclosed the fact that by adopting the approach from such an “upper stream,” the specifications of the project focusing on Japanese technologies are determined, facilitating the realization under the JCM including competition with overseas technologies and bidding.

(3) Maintenance of the mid-and-long term cooperative relationships in collaboration with JICA, JBIC and international financial institutions

Kitakyushu and Yokohama have already established organic cooperation with JICA projects for continual City-to-City cooperation. To produce specific results from the City-to-City cooperation project implemented on a single-year basis by the MOE, it is very effective to implement the project at the right time under the framework of such mid-and-long term cooperation.

In line with the viewpoint of continual cooperation, providing necessary preconditions would be considered as another practice helping formation of JCM projects. As observed in Bangkok case, the energy-saving potential surveys and projects for Support of Japanese SMEs Overseas Business Development provided preparation stages required for the formation of JCM projects. Regarding the successful cases in technological transfer by Germany studied so far, the German Federal Ministry for Economic Cooperation and Development (Bundesministerium für wirtschaftliche Zusammenarbeit und Entwicklung: BMZ), the German Agency for International Cooperation (Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH; counterpart of JICA), and the German Development Bank (Kreditanstalt für Wiederaufbau: KfW; counterpart of JBIC) collaborate with one another on a project basis, leading to successful cases.

(4) Follow-up after the completion of the project

The City-to-City cooperation has been continually implemented as described in (3) but the MOE's City-to-City cooperation project is a single-year based one resulting that the future development from individual projects has not been fully followed up. For example, although both the DPI of Da Nang and private business operators in Surabaya show willingness to implement new projects under the Financing Programme for JCM Model Projects in this survey, no follow-up has been conducted for them. Establishment of a system for future follow-up of projects could be an efficient way particularly for the partner to whom capacity building has been provided. While, following up the project formation between private enterprises by the local government is limited, however utilization of private enterprises developing Energy Service Companies (ESCOs) there might be an option.

(5) Utilization of local consultants

As for the promotion of the Financing Programme for JCM Model Projects realization through the City-to-City cooperation project, there is a possibility that the enterprises involved in FS, the failure risks of which are few, may have weak incentives to succeed under the Financing Programme for JCM Model Projects. Since local consultants in the partner country may be often involved in construction under the project and MRV, their incentives to realize the project are expected to be high. Although general communication through interpreters is limited, participation of local consultants will enhance the knowledge and information exchanged between the two parties, promoting the quality of communication.

2) Toward large-scale development of JCM

(1) Shift to projects focusing on GHG reductions

In the refuse and sewerage fields, the reduction of methane gas had higher priority to achieve rather than CO₂ reduction under the City-to-City cooperation, Needs for service-providing projects are also high, in addition to facility construction projects. For development of the Financing Programme for JCM Model Projects on a large scale under the City-to-City cooperation, it would be important to cope with such on-site needs. Therefore, it is necessary to promote the shift to another type of project where economic incentives are created in accordance with the amount of reduced GHGs generated from the project besides the current subsidy program for construction of facilities. The methodology to secure the proper amount of credits is also expected to be reconsidered while taking account of international negotiation

trends under the UN Framework Convention on Climate Change.

As for the conventional Financing Programme for JCM Model Projects for CO₂ reductions, it would also be better to regulate the energy efficiency and CO₂ emission reduction rules/standards and introduce benchmarking to the Financing Programme for JCM Model Projects.

(2) Showcasing the existing JCM projects

The current Financing Programme for JCM Model Projects must play the role of verifying the effectiveness of Japanese technologies as a model case, but it does not necessarily demonstrate its function as a showcase fully. It would be necessary to proactively promote the publication and dissemination of the JCM system with projects realized under the Financing Programme for JCM Model Projects.

(3) Collaboration with financial institutions

To smoothly and massively promote the Financing Programme for JCM Model Projects for construction of facilities, it would be expected to involve SMEs with weaker capital strength other than large enterprises. For SMEs, securement of 50% initial investment will be a major challenge. To facilitate the issue, it would be very effective to improve the system of low-interest loans provided by the Environmental Restoration and Conservation Agency (ERCA) or a project system provided under fixed monthly payments like ESCO in collaboration with the partner country government, the local government, and a financial institution. In India, JBIC offers a system titled Global Action for Reconciling Economic Growth and Environmental Preservation (GREEN) for local banks to support local business. This is one of the better cases to reference.

(4) Lateral expansion from the support to the existing local project

It is important to laterally expand the project under the Financing Programme for JCM Model Projects in the partner country and to its neighboring countries without completing it as a single project. For that purpose, it is necessary to promote lateral expansion technically by gradually reducing the subsidy rate for the same types of technologies in combination with lease schemes.

In the successful cases in Germany, there were some projects where relationships with local stakeholders were established through the involvement of the existing project in Indonesia, and support was provided in laterally expanding the same model project later. By taking this

approach, a system based on the local customs has been established, leading to gain credibility. In that case, a system using the students from the partner country and their network were constructed. Also in Japan, it would be very important in terms of software to provide support using the database of foreign alumni and making full use of their network after their return.

(5) Utilization of local consultants

Although in Japanese projects, Japanese consultants usually visit the partner country to implement the Financing Programme for JCM Model Projects, this approach does not work well because of communication difficulties caused by non-fluency in local languages. To solve such problems, collaboration with local consultants is also expected for better exchange of knowledge, skills, and information. As observed in Bangkok, there was a case where a local consultant was requested for the introduction of new facilities to a hospital in Bangkok. In addition, interviewee mentioned that they prefer locally renowned consultants to foreign consultants that are not well known there.