Future City Kitakyushu

@teitan & black teitan,City of Kitakyushu

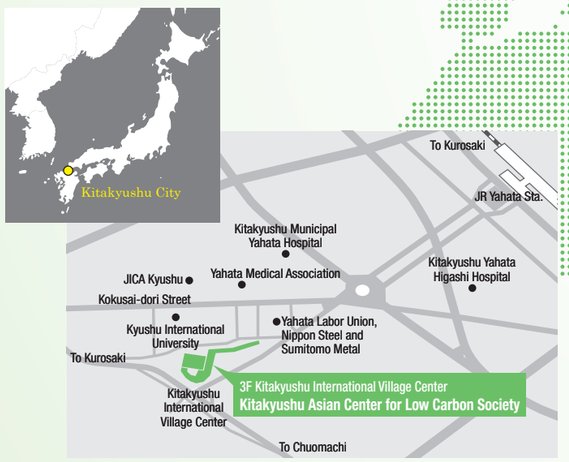
Kitakyushu Environmental Mascot
"Teitan""Black Teitan"

Kitakyushu as the World Capital of Sustainable Development

Although Kitakyushu suffered from severe environmental pollution in the 1960s, the concerted efforts of the local residents, businesses, and the government allowed the city to prevail over the environmental pollution that affected those who lived there. Mobilizing these experiences, Kitakyushu developed a diverse set of international cooperation activities, and built networks with various cities. Kitakyushu has also played a leading role in the development of a recycling society, and has been contributing to the creation of a low-carbon society. These actions received high acclaim from the Organisation of Economic Co-operation and Development (OECD), which characterized Kitakyushu as a formerly polluted industrial zone that has become a "modern industrial city pursuing green growth."

Selected as a model city in the OECD Green Cities Programme!

Together with the cities of Paris, Chicago, and Stockholm, Kitakyushu was selected by OECD as the first model city for green growth in Asia in June 2011.
A report on the environmental policies and measures of Kitakyushu were published in a report by OECD in May 2013.
OECD is the world's largest think tank with 35 member countries and regions, and experts from more than 100 countries around the globe, including Brazil, Russia, and African countries. This sharing of technical knowledge and experience has expanded OECD's sphere of communication and influence on world affairs.



Asian Green Camp

Kitakyushu Asian Center for Low Carbon Society

Creating a better future for Asia with the initiatives of Kitakyushu

Kitakyushu Asian Center for Low Carbon Society

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The collective environmental technologies of the City of Kitakyushu and Japan are used to promote a

“Low-Carbon Asia”

Goals have been set for reducing CO_2 emissions citywide by 50%, and throughout Asia by 150% by 2050 (compared to 2005 levels).

The City of Kitakyushu established the Kitakyushu Asian Center for Low Carbon Society in June 2010.

§ Kitakyushu was selected as an Eco-Model City by the Japanese government in July 2008. In March 2009, Kitakyushu formulated the Eco-Model City Action Plan (Kitakyushu Green Frontier Plan). In this plan, Kitakyushu set a target to reduce greenhouse gas emissions by 50% citywide, and by 150% throughout Asia (compared to 2005 levels). The Kitakyushu Asian Center for Low Carbon Society is dedicated to achieving a low-carbon society in the Asian region.

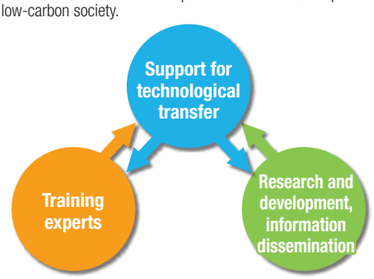
• Center Objectives

To reduce greenhouse gas (GHG) emissions substantially while enjoying a prosperous life, we need to change our attitudes and reconsider conventional ways of living. In the field of environmental technologies, it is becoming more important to both develop new technologies that contribute to innovative environmental solutions and create new business models, as well as improve utilization of existing technologies. In the field of social technologies, the need for eco-conscious urban development through alternative energies will increase, while it also becomes more important to change our lifestyles and attitudes. The Kitakyushu Asian Center for Low Carbon Society is dedicated to promoting technology transfers to Asian societies in the fields of environmental and social technologies, so as to promote social reforms, create new values, and facilitate cultural development. The Center is taking the initiative to promote a low-carbon revolution in Asia.

• Roles and Functions of the Center

Use of local resources
- Experience and know-how in overcoming pollution
- Collection of sophisticated environmental technologies and social systems
  (resource- and energy-saving technologies, Kitakyushu Eco-Town, Kitakyushu Smart Community, etc.)
- Close networks with Asian cities through international environmental cooperation activities

- Support from various areas to link techniques, such as environmental technologies and community development, to the business activities of companies in order to develop a low-carbon society.



- Train experts in low-carbon technologies in cooperation with the industrial sector and universities.
- Provide and disseminate information on studies and research on environmental policies and eco-businesses, and a menu of support from the national government and public institutions directed at businesses.

Promotes a low-carbon Asia and stimulates the local economy

Monitoring through **K-MRV**

In cooperation with

National and public institutions, related organizations in the city, economic organizations, businesses, etc.

President

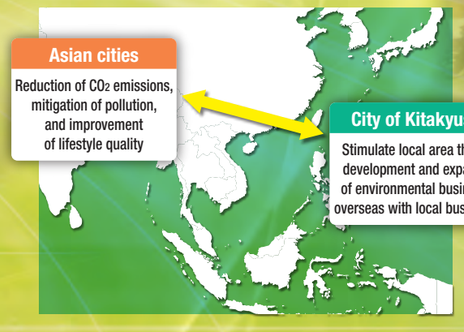
Advisory Board

Hiroshi Komiyama
President

Training experts	Technological transfer	Research and development
Kitakyushu International Techno-cooperative Association (KITA)	International Environmental Strategies Department, Environment Bureau, City of Kitakyushu	Kitakyushu Urban Centre, Institute for Global Environmental Strategies (IGES)

In addition to international environmental cooperation, Kitakyushu aims to promote methods and techniques unique to Japan that are appreciated by, and respectful of, local people in other countries when developing and expanding international environmental business opportunities.

Creating a WIN-WIN situation



• Main services of the Center provided to local companies

>Technology package

If a business's component technology is unable to meet the needs of customers overseas, the Center works with companies to integrate technologies, equipment, products, and even maintenance services to create customized packages and enable increased business opportunities in overseas markets.

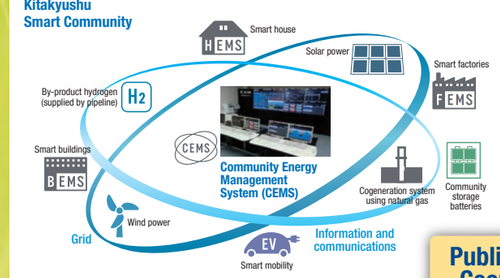
- >Improving technology to meet needs
- >Surveys on marketability
- >Support for demonstration projects
- >Assist in submission of application for subsidy
- >Provide financial or intellectual aid
- >On-site assistance through overseas offices
- >Dispatch of business missions

Priority fields in technology transfer

Energy Management

Smart energy management in the entire area using CEMS

Kitakyushu Smart Community



Water Business

Optimal solutions offered by the integrated approach of the government and private sector

- Kitakyushu Overseas Water Business Association
  - Established in August 2010
    Project formation activities for water infrastructure are developed with the Association at the focal point

  - Construction consultancy firms
  - Plant construction companies
  - Financial/trade companies
  - Engineering and construction
  - Electrical machinery and instrumentation/device systems, etc.
  - Other companies

- Global strategic base for water business
  - Showcase for advanced water and environmental technologies

New administration building for the Hagan Sewage Treatment Plant (scheduled to start April 2015)

Implementation of International training projects

Exhibition of technologies and products

Business matching

Development of state-of-the-art technologies

Public/Private Cooperation
Transfer environmental technologies and social systems as a package

Cleaner Production and Prevention of Pollution

Development of production systems with low environmental impacts and end-of-pipe measures

Introduction of cleaner production (CP)

- Assessment and improvement of the use of raw materials and fuel
- Improvement of production processes
- Complete and accurate control of operations and maintenance
- Development of human resources, etc.

→

- Achievement of energy savings and conservation of resources
- Mitigation of environmental impacts + improvement of production

End-of-Pipe (EOP) measures

Electrostatic precipitator

Flue gas desulfurization equipment

Wastewater treatment equipment

Recycling & Waste Treatment

Kitakyushu Eco-Town Project

Home appliance recycling

Automobile recycling

Economic effects (27 projects)
- Direct investment JPY 71.4 billion
- Jobs created About 1,000 people
- CO_2 reductions About 380,000 tons annually

Shaft gasification furnaces represent the most advanced technology for waste treatment

Shin-Moji Plant

Achieve safe and effective use of resource recovery of waste and heat energy

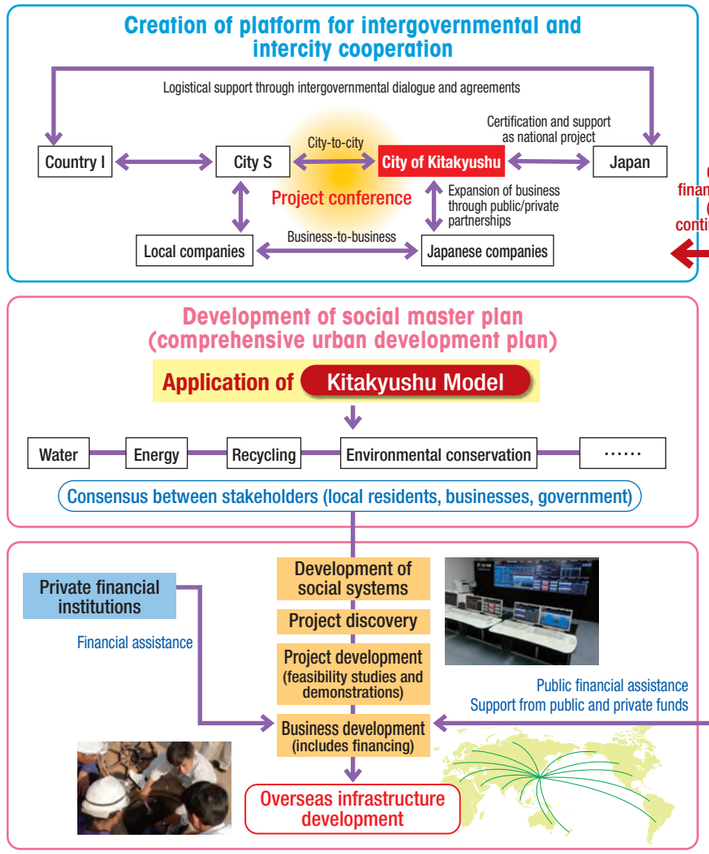
Take Asia's vitality and grow together with the region as it takes a leading role on the global stage

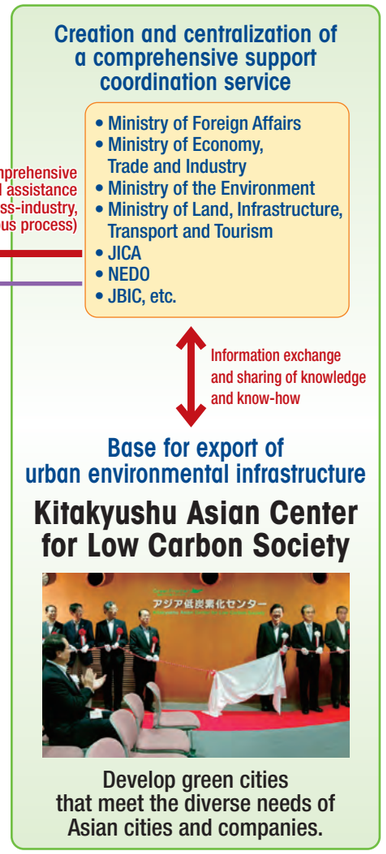
Target: 75 projects by 2020, formation of JPY 20 billion in new businesses

New System for the Development of a Low-Carbon Asia

• Development scheme for the export of urban environmental infrastructure

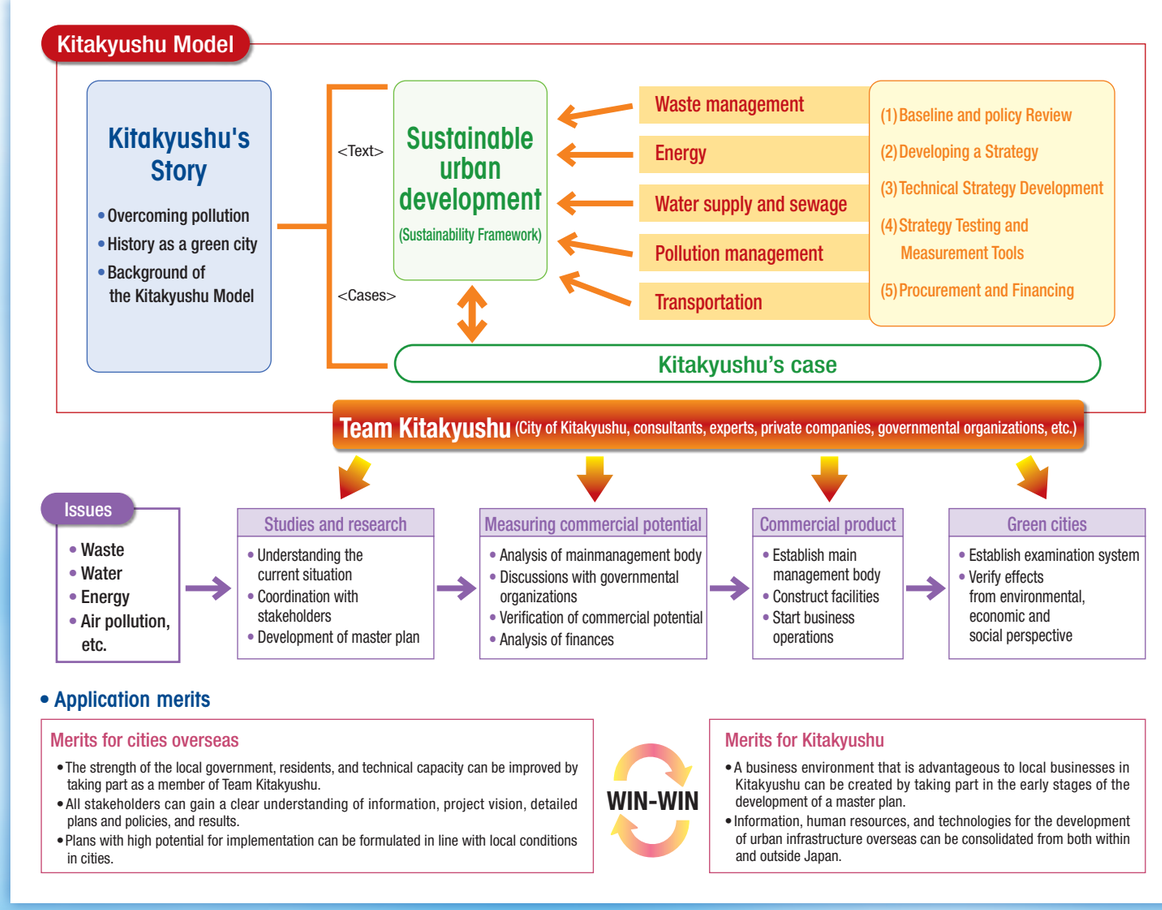
In addition to the transfer of technology and plants, newly emerging economies that are facing unprecedented growth are also seeking to develop as green cities (eco-friendly or sustainable cities), such as eco-cities and smart cities. The Center uses intercity cooperation frameworks and the Kitakyushu Model to create green cities that meet the varied needs of Asian countries and promote the export of urban environmental infrastructure.





• Comprehensive urban solutions using the Kitakyushu Model

The Kitakyushu Model systematically arranges information on the knowledge and environmental technologies of Kitakyushu from its experience in overcoming pollution to its quest as an environmental city. The Kitakyushu Model is used to develop customized master plans to create sustainable cities that meet the needs of Asian cities, and for the export of green cities (eco-friendly cities).



• Application merits

Merits for cities overseas

- The strength of the local government, residents, and technical capacity can be improved by taking part as a member of Team Kitakyushu.
- All stakeholders can gain a clear understanding of information, project vision, detailed plans and policies, and results.
- Plans with high potential for implementation can be formulated in line with local conditions in cities.

WIN-WIN

Merits for Kitakyushu

- A business environment that is advantageous to local businesses in Kitakyushu can be created by taking part in the early stages of the development of a master plan.
- Information, human resources, and technologies for the development of urban infrastructure overseas can be consolidated from both within and outside Japan.

Export of Green Cities (Case of Surabaya)

The export of the green city concept to the city of Surabaya in Indonesia is one of the Center's most important projects. Activities have been developed in various sectors, such as waste, water and sewage systems, energy, and urban development, in order to create a model for the export of green cities. These activities are used to formulate a comprehensive urban development plan that incorporates both the creation of a social system and changes in public awareness, and which is based on a "green" and "low-carbon" perspective.

Conclusion of MoU as Green Sister Cities (November 2012)

Kitakyushu New Low-Carbon Measurement, Reporting and Verification Mechanism (K-MRV)

K-MRV

• Project Outline

The Kitakyushu New Low-Carbon Measurement, Reporting and Verification Mechanism (K-MRV) **visibly quantifies greenhouse gas reductions** through low-carbon projects carried out in Asia by the City of Kitakyushu and local businesses in Kitakyushu. By visually quantifying greenhouse gas emissions, the mechanism will promote the export of high, value-added technologies of local businesses and stimulate the local economy, in order to contribute to the reduction of greenhouse gas emissions in the entire Asian region.
The mechanism is also designed for coordination with Japan's Joint Crediting Mechanism (JCM).

§ MRV is the acronym for the "measurement," "reporting," and "verification" of greenhouse gas emission reductions, and is made up of the first letter of each word. The K-MRV is Kitakyushu's version of the MRV.

• Target Projects

In principle, target projects are those that contribute to the following three types of low-carbon activities carried out in overseas.

- Projects implemented or being implemented with the City of Kitakyushu as the main implementation body
- Projects implemented or being implemented by businesses with offices in Kitakyushu
- Projects implemented or being implemented by businesses outside Kitakyushu that are supported by the City of Kitakyushu

Application → Review → Approval → Implementation → Reporting
Approval → Certification issued

• Issuance of certification

Written recognition is issued by the Mayor of Kitakyushu for certified projects.

Project proponents can utilize this written recognition as PR for approved technologies or products.

Steady Development in the Asian Region

Kitakyushu Asian Center for Low Carbon Society is involved in a variety of projects that use funding from the national government, including the Ministry of Economy, Trade and Industry (METI), the Ministry of the Environment (MOE), and the Ministry of Foreign Affairs (MOFA), and is moving through the various project stages of feasibility studies (FIS), demonstrations, and commercialization together with local businesses.
To date, the center has been involved in the implementation of 143 projects in 57 cities in Asia, in cooperation with 106 companies in Japan (as of March 2017).

Feasibility Studies and Commercialization

1 ~ 3 **Yaskawa Electric Corporation: Energy conservation projects**
- 1 Ministry of Economy, Trade and Industry (FY 2010: Beijing, China)
- 2 Ministry of the Environment (FY 2011: Shaanxi Province, China)
- 3 Sixth Japan-China Energy Conservation and Environmental Forum Cooperation Project (FY 2011: Tianjin, China)

4 ~ 5 **TOTO Ltd.: Projects to promote low-energy home appliances**
- 4 Ministry of the Environment (FY 2011: Dalian, China)
- 5 Ministry of Economy, Trade and Industry (FY 2012: Ho Chi Minh, Hanoi, Vietnam)

6 **TOTO Ltd.: F/S project for the creation of a large-scale JCM project through the increased adoption of water-saving equipment**
Ministry of the Environment (FY 2013: Ho Chi Minh)

7 **TOTO Ltd.: Environmental improvement project for the creation of a large-scale JCM project through the increased adoption of water-saving equipment**
Ministry of the Environment (FY 2013: Surabaya, Indonesia, Iskandar RDA, Malaysia)

8 ~ 9 **Nippon Magnetic Dressing Co., Ltd.: Projects for recycling discarded electrical appliances**
- 8 Ministry of Economy, Trade and Industry (FY 2011: India)
- 9 Ministry of Economy, Trade and Industry (FY 2012-FY 2013: Vietnam)

10 **Nippon Magnetic Dressing Co., Ltd: R&D demonstration project on advanced recycling systems for electrical and electronic waste equipment**
NEDO demonstration project (FY 2012-FY 2013): Mumbai and surrounding regions, India)

11 **Hitachi Ltd., others: Dahej Eco-City Development Support**
Ministry of Economy, Trade and Industry (FY 2010: Dahej area, India)

12 **Eco-Material Corporation: Project for recycling waste plastics**
Ministry of the Environment (FY 2011, FY 2012: Tianjin)

13 **Kyushu Metal Industry Co., Ltd: Project for recycling used automobiles**
Ministry of Economy, Trade and Industry (FY 2012, FY 2013: Tianjin)

14 **Project for cooperation and advancement of recycling-oriented cities through a Kitakyushu-Dalian partnership**
Ministry of Economy, Trade and Industry (FY 2009-FY 2011: Dalian)

15 **Matsumoto Mitsuharu Shoten: Project for building a used paper recycling system**
Ministry of Economy, Trade and Industry (FY 2012: Dalian)

16 **Matsumoto Mitsuharu Shoten: Production and sales of recyclable refuse paper and plastic fuel (RPF)**
Ministry of the Environment (FY 2014: Dalian)

17 **The Japan Research Institute, Limited, others: Building environmentally-friendly cities in Malaysia**
NEDO (FY 2011: Putrajaya, Cyberjaya, Malaysia)

18 **The Japan Research Institute, Limited, and other bodies: BEMS Aggregation Project**
Ministry of Economy, Trade and Industry (FY 2012: Putrajaya)

19 **Toray Group: Indonesia BoP Project**
JICA (FY 2011 – FY 2012: Sumbawa Province, and other areas in, Indonesia)

20 **Isikawa Engineering Co., Ltd.: Water purification equipment for communities**
JETRO (FY 2011: Surabaya)

21 ~ 22 **Nippon Steel & Sumikin Engineering Co., Ltd.: Cogeneration and energy-saving project in Surabaya Industrial Estate Rungkut (SIER)**
- 21 Ministry of Economy, Trade and Industry (FY 2012: Surabaya)
- 22 Ministry of Economy, Trade and Industry (FY 2013: Surabaya)

23 **Nishihara Corporation: Pilot project for intermediate waste disposal and recycling facilities**
Ministry of Foreign Affairs (FY 2012: Surabaya)

24 **Nishihara Corporation: Project to promote intermediate processing and compost-making for the recycling of waste**
JICA (FY 2013-FY 2014: Surabaya)

25 **Hitachi Zosen, and other bodies: Power generation project from municipal solid waste**
Ministry of the Environment (FY 2014: Surabaya)

26 **Shinryo Corporation: Project for total recycling in electronic manufacturing processes in Malaysia and other**
Ministry of the Environment (FY 2012: All Malaysia)

27 **Shinryo Corporation: Project to construct a recycling system spanning the entire electronics industry value chain**
Ministry of the Environment (FY 2013: Special Capital Region of Jakarta, and other areas, Indonesia)

28 **Nippon Steel Chemical: Licensing of nitrate nitrogen removal technology**
(FY 2010: Dalian)

29 ~ 30 **Nishihara Corporation: Materials recycling project from plastic shopping bags and other flexible plastic waste**
- 29 Ministry of the Environment (FY 2013: Metro Cebu area, Philippines)
- 30 Ministry of the Environment (FY 2014: Metro Cebu area)

31 **Isikawa Engineering Co., Ltd.: Project on the safe and stable supply of drinking water for communities**
JICA (FY 2013-FY 2015: Surabaya)

32 **Shabondama Sekken Co., Ltd.: Model project to promote the adoption of firefighting technology for peat and forest fires**
JICA (FY 2013-FY 2015: Balikpapan, Indonesia)

33 **Kitakyushu Environmental Preservation Association (KITA): Collaborative project for the improvement of farmers' livelihoods with a focus on castor beans**
JICA (FY 2013-FY 2015: West Nusa Tenggara, Indonesia)

34 **Shinryo Corporation: Waste management optimization: Recycling of municipal garbage and effective utilization of surplus biomass from the palm industry**
JICA (FY 2013-FY 2015: Medan, Indonesia)

35 **Kitakyushu International Techno-cooperative Association: Promotion of small and medium-sized enterprises: Support for staff training, technology improvement, and expansion of sales channels**
JICA (FY 2013-FY 2015: Haiphong, Vietnam)

36 **Nippon Magnetic Dressing Co., Ltd.: Project for recycling electrical and electronic waste equipment**
Ministry of Economy, Trade and Industry
(FY 2013: Manila, Metro Cebu area, Philippines)

37 **IGES: Technical cooperation for low-carbon city plan development**
Ministry of the Environment (FY 2013: Surabaya)

38 **IGES: Support for low-carbon city plan development**
Ministry of the Environment (FY 2014: Surabaya)

39 **IGES, other: Study on construction of basic infrastructure to expand coverage of low-carbon projects in Surabaya**
Ministry of the Environment (FY 2015: Surabaya)

40 **Nikken Sekkei Civil Engineering Ltd., other: Project to support the formulation of the Haiphong Green Growth Promotion Plan**
Ministry of the Environment (FY 2014: Haiphong)

41 **Amita Corporation, and other bodies: Low-carbon development of Haiphong City**
Ministry of the Environment (FY 2015: Haiphong)

42 **Panasonic Corporation, other: F/S on the formation of a large-scale project on the reduction of greenhouse gases**
Ministry of the Environment (FY 2014: Iskandar RDA)

43 **NTT Data Institute of Management Consulting, Inc.: Study on construction of basic infrastructure to expand coverage of low-carbon projects**
Ministry of the Environment: FY 2015: Iskandar RDA)

44 **Amita Institute for Sustainable Economies: F/S on comprehensive resource recycling system to create a low-carbon society**
Ministry of the Environment (FY 2014: Koror State, Airai State, Palau)

45 ~ 46 **Amita Corporation: Recycling waste project in Malaysia**
- 45 Ministry of the Environment (FY 2014: Malaysia)
- 46 Ministry of the Environment (FY 2015: Malaysia)

47 **Nippon Steel and Sumikin Engineering Co., Ltd.: Community-based sound material cycle waste-to-power project in an industrial park (Laguna Techno-Park) and surrounding areas**
Ministry of the Environment (FY 2014: Laguna Province, Philippines)

48 **CTI Engineering Co., Ltd., and other bodies: F/S on project development for the introduction of smart community technologies in housing and urban development**
Ministry of Economy, Trade and Industry
(FY 2014: South Tangerang, Banten Province, Indonesia)

49 **Fuji Electric Co., Ltd., and other bodies: Introduction of co-generation system in hotels**
Ministry of the Environment (FY 2014: Surabaya)

50 **The Merry Corporation, and other bodies: Improvement of solid waste management in Fraser's Hill**
JICA (FY 2014-FY 2016: Pahang State, Malaysia)

51 **Fuji Electric Co., Ltd., and other bodies: Demonstration project on smart grid technologies in India**
NEDO (FY 2014-FY 2015: Panipat District, Haryana State, India)

52 **Nippon Steel & Sumikin Engineering Co., Ltd.: Promotion for the development and expansion of waste power generation technologies**
JICA (FY 2014-FY 2015: Davao, Philippines)

53 **EX Research Institute Ltd.: Research on the advancement of waste treatment in Thailand**
NEDO (FY 2014-FY 2015: Rayong Province, Thailand)

54 **MI Consulting Corporation, and other bodies: Development of urban environmental improvement plan in Rayong Province**
HIDA (FY 2014: Rayong Province, Map Ta Phut City, Rayong City, Thailand)

55 **Nippon Steel & Sumikin Engineering Co., Ltd.: F/S on waste-to-energy from landfill waste**
Ministry of the Environment (FY 2015: Samut Prakan Province, Thailand)

56 **Amita Corporation, and other bodies: Municipal waste management in Rayong Province and promotion of low-carbon development of eco-industrial town**
Ministry of the Environment (FY 2015: Rayong Province)

57 **IGES: Reduction of short-lived climate pollutants in solid waste management by local governments**
UNEP/Ministry of the Environment (FY 2015: Rayong Province)

58 **Amita Corporation: Waste Recycling in Taiwan**
Ministry of the Environment (FY 2014: Taiwan)

59 ~ 60 **AMITA Institute for Sustainable Economies Co., Ltd.: Development of comprehensive resource recycling system in island regions**
- 59 Ministry of the Environment (FY 2015: Koror State, Airai State)
- 60 Ministry of the Environment (FY 2016: Koror State, Airai State)

61 **NTT Facilities: Project on energy savings in air conditioning at shopping malls using a high-efficiency turbo refrigeration machines**
Ministry of the Environment (FY 2015: Surabaya)

62 **NTT Facilities: Introduction of smart LED street lighting system to industrial parks**
Ministry of the Environment (FY 2015: Karawang Province, Indonesia)

63 **NTT Data Institute of Management Consulting, Inc.: Introduction of high-efficiency inverters and air conditioners in hotels**
Ministry of the Environment (FY 2015: Hanoi)

64 **Nippon Magnetic Dressing Co., Ltd.: Project to support the development of a recycling system for electrical and electronic waste**
Ministry of Economy, Trade and Industry (FY 2014: Vietnam)

65 **Nippon Magnetic Dressing Co., Ltd. : F/S on the collection and recycling of used products**
Ministry of Economy, Trade and Industry (FY 2015: Vietnam)

66 **Nippon Steel and Sumikin Engineering Co., Ltd.: Waste-to-energy project through co-combustion of solid fuel from sewage sludge and municipal waste**
Ministry of the Environment (FY 2015: Haiphong)

67 **IGES: Reduction of short-lived climate pollutants in solid waste management by local governments**
UNEP/Ministry of the Environment (FY 2015-2016: Surabaya)

68 **TOTO Ltd.: Introduction of high-efficiency combustion furnaces in sanitary ware production factories**
Ministry of the Environment (FY 2015: Hung Yen Province, Vietnam)

69 **SoftEnergy Controls Inc.: Development of zero emission EV buses through cooperation on photovoltaic power generation feasible for Cat Ba Island**
Ministry of the Environment (FY 2015-FY 2016: Haiphong)

70 **Shabondama Sekken Co., Ltd.: Study on the development of projects to introduce initial firefighting technology to control forest fires**
JICA (FY 2016: Indonesia)

71 **Isikawa Engineering Co., Ltd.: Study on the development of projects to improve drinking water supply in Surabaya**
JICA (FY 2016: Surabaya)

72 **NTT Data Institute of Management Consulting, Inc.: Project to promote the implementation and expansion of low-carbon development models in eco-industrial towns**
Ministry of the Environment (FY 2016: Rayong Province, other)

73 **Nippon Steel & Sumikin Engineering Co., Ltd., and other bodies: Project on power generation with the use of waste heat from the incineration of municipal solid waste**
Ministry of the Environment (FY 2016: Rayong Province, other)

74 **Nishihara Corporation: Project on the development of a system for business waste countermeasures centered on separation and composting complex facilities**
Ministry of the Environment (FY 2016: Surabaya)

75 **NTT Data Institute of Management Consulting, Inc.: Project to promote low-carbon development in Haiphong**
Ministry of the Environment (FY 2016: Haiphong)

76 **NTT Data Institute of Management Consulting, Inc.: Promotion of the Iskandar Model Project to promote the JCM**
Ministry of the Environment (FY 2016: Iskandar RDA)

77 **Nikken Sekkei Civil Engineering Ltd.: Project to support the formulation of the Phnom Penh Climate Change Strategic Action Plan**
Ministry of the Environment (FY 2016: Phnom Penh Capital City, Cambodia)

78 **NTT Data Institute of Management Consulting, Inc.: Promotion of low-carbon development by promoting the introduction of energy savings and renewable energies**
Ministry of the Environment (FY 2016: Phnom Penh Capital City)

79 **Nomura Kohsan Co., Ltd.: Project for the wide-area treatment of waste containing mercury for the Philippines**
Ministry of the Environment (FY 2016: Philippines)

80 **Aeon Mall Co., Ltd.: Introduction of large-scale photovoltaic power generation and high-efficiency chillers in large shopping malls**
Ministry of the Environment (FY 2016: Phnom Penh Capital City)

81 **Kawasaki Heavy Industries Ltd., and other bodies: Introduction of a power generation system in a cement factory with the recovery of waste heat**
Ministry of the Environment (FY 2016: Saraburi Province, Thailand)

82 **Fuji Electric Co., Ltd.: Demonstration project on smart grid-related technology**
NEDO (FY 2015-FY 2018: Panipat District, Haryana State)

83 **Kitakyushu Environmental Preservation Association: Project to support waste management improvement**
JICA (FY 2016-FY 2019: Davao)

84 **Mizuho Research Institute Ltd., and other bodies: Information collection and identification of environmentally-friendly industrial clusters and logistics hub concept**
JICA (FY 2016: Ba Ria–Vung Tau Province, Vietnam)

Support Project for Small- and medium-Sized Businesses for Development in Asia

Newly established in FY 2011 as a system to partially subsidize costs and carry out on-site demonstrations, tests and project feasibility studies (F/S) on technologies and products owned by small and medium-sized businesses in Kitakyushu that contribute to low-carbon development in line with needs overseas.

1. **Hohkohsya Co., Ltd.: Project to promote low-energy lighting in Thailand** (FY 2011: Pathum Thani Province, Thailand)
2. **Fujico Co., Ltd.: Project to promote photocatalytic antibacterial tiles in Korea** (FY 2011: Pohang, Korea)
3. **Kokura Synthetic Industries Ltd.: Project to refine castor oil in Indonesia** (FY 2016: Sumbawa Province Besar, Indonesia)
4. **Sepa-Sigma Inc.: Project to recycle liquid waste from semiconductor manufacturing in Korea** (FY 2012: Korea)
5. **Recycle Energy Co., Ltd.: Project on creating oil from waste plastics in Malaysia** (FY 2012: Johor State, Malaysia)
6. **Beetle Management Co., Ltd.: Project for intermediate waste processing in Indonesia** (FY 2012: Surabaya, Indonesia)
7. **Kitakyushu Environmental Investment Ltd.: Project on materials for processing soil contaminated with heavy metals in Shanghai** (FY 2013: Shanghai, China)
8. **Kitakyushu Environmental Investment Ltd.: Project on materials for processing soil contaminated with heavy metals in Shanghai** (FY 2013: Shanghai, China)
9. **Isikawa Engineering Co., Ltd.: Demonstration project on production systems for drinking water** (FY 2014: Surabaya)
10. **EIS Co., Ltd.: Demonstration project on the installation of LED lighting on streets in Ho Chi Minh** (FY 2014: Ho Chi Minh, Vietnam)
11. **Environmental Technology Service Co., Ltd.: Demonstration of on-site analysis technology for contaminated soil in China** (FY 2014: Dalian, China)
12. **Kyushu Medical Co., Ltd.: F/S on the development of an Asian market for microbial insecticides for mosquitoes that carry the dengue virus** (FY 2014: Singapore)
13. **Nessan Heat Corporation: Business linkages for heat treatment technologies in power generation projects in Indonesia** (FY 2014: Indonesia)
14. **Nagata Engineering Co., Ltd.: F/S on the introduction of dry coal cleaning systems in Mongolia** (FY 2015: Ömnögovi Province, Mongolia)
15. **Shabondama Sekken Co., Ltd.: Study on the marketability of effective soap-based, fire-extinguishing agent to protect forest resources and that have a small impact on the environment** (FY 2015: Surabaya)
16. **Fujico Co., Ltd.: Development of business for air fresheners and sterilizers using photocatalysts in the Hong Kong and Taiwan markets** (FY 2015: Hong Kong, Taiwan)
17. **Kyushu Medical Co., Ltd.: F/S on the development of an Asian market for insecticides for mosquito larvae that carry the dengue virus** (FY 2015: Surabaya)
18. **Uni-Elex Co., Ltd.: Demonstration test on energy-saving systems feasible for the private water supply sector in Cambodia** (FY 2016: Cambodia)
19. **The Merry Corporation: F/S on recycling projects for business food waste in Malaysia** (FY 2016: Malaysia)
20. **SoftEnergy Controls Inc.: Study on communications protocol and charging/discharging data for standard Vietnamese and Chinese chargers for the promotion of low-pollution vehicles on Cat Ba Island** (FY 2016: Haiphong, Vietnam)

Water Supply and Sewage maintenance project

■ Cambodia

1. Support for the basic design of a water purification plant in Siem Reap
2. Water supply improvement project in Sen Monorom
3. F/S on the application of Japanese technologies for regional water supply in Kampot and Kep
4. Preliminary study on water supply extension and improvement project in Battambang and Kampon Cham
5. Formulation of the sewerage system improvement plan in Siem Reap
6. Improvement of the management capacity for waterworks facilities in Siem Reap
7. Delivery of electrical products to Cambodia
8. Water supply extension plan in Battambang and Kampong Cham
9. F/S on the formulation of JCM projects in Phnom Penh
10. Support for the organization of trainings in Cambodia on Japanese sewerage systems
11. Preliminary study on plans to extend water supply in Kampot and Sihanoukville
12. Energy reduction through efficiency improvement in water purification facilities of the Phnom Penh Water Supply Authority
13. Delivery of an on-board ceramic membrane filtration system in Cambodia
14. Extension of water supply in Kampong Cham and Battambang
15. Sewage and wastewater improvement project in Phnom Penh Capital City
16. Study on promoting overseas deployment of infrastructure systems in Cambodia
17. Expansion and detailed design work of water supply facilities in Kampot
18. Expansion of water supply and detailed design work in Siem Reap
19. Water supply improvement project in Sen Monorom
    (Introduction of main facilities for water purification plants)
20. Water supply improvement project in Kampot (construction contract order)
21. Management capacity for sewage and wastewater facilities in Phnom Penh Capital City

■ Vietnam

22. Study on block water distribution system in Haiphong
23. Human resources development for sewerage systems in Haiphong
24. U-BCF improvement project in Haiphong
25. Identification and formulation of public-private partnership projects for overseas water business in the water supply business
    (Vietnamese Ministry of Health, Labor and Welfare)
26. Capacity building for management of water distribution networks in Haiphong, Vietnam
27. U-BCF needs survey in 8 cities in Vietnam
28. Preparatory study on improvement plans for the An Duong Water Purification Plant in Haiphong
29. Capacity building projects for maintenance and management of the sewerage system in Haiphong
30. Reconstruction of the mapping system of Haiphong Water Supply One Member Co., Ltd. in Vietnam
31. U-BCF demonstration project in 6 regional cities in Vietnam
32. Improvement plan and detailed design for the An Duong Water Purification Plant in Haiphong

■ Indonesia

33. Formulation of a sewerage improvement plan for Surabaya
34. Supplementary study on the sewerage improvement project in the Special Capital Region of Jakarta
35. Support project for the organization of trainings in Indonesia on Japanese sewerage systems
36. Capacity building project for the formulation of a plan to improve the sewerage system in the Special Capital Region of Jakarta
37. Consulting work related to the capacity building project for the formulation of a plan to improve the sewerage system in the Special Capital Region of Jakarta, Indonesia

■ Myanmar

38. Project on improving operation and management capacity at a water purification plant in Mandalay

■ China

39. Delivery of high-voltage inverter at a water purification plant in Dalian, China

Industrial Waste Recycling Projects in Taiwan and Malaysia

Amita Corporation

Amita Corporation established a resource recycling plant in Kitakyushu Eco-Town (six sites nationwide), with the aim of achieving global resource recycling in Asia. Since 2010, Amita has been engaged in the manufacturing of raw fuel for cement from industrial waste. In 2016, Amita Corporation opened a resource recycling plant in Changhua County, Taiwan, recycling 100% of industrial waste, such as silicon slurry waste liquid, and carrying out operations to supply recovered coolant, abrasive grains, and chip shavings to users as recyclable resources. In 2017, Amita plans to open a recycling resource manufacturing plant in the State of Selagor, Malaysia to provide the raw fuel for manufacturing cement from industrial waste to be supplied to local cement factories.

Intermediate Recycling Treatment of Waste in Surabaya

Nishihara Corporation

With support from the Ministry of the Environment and JICA, Nishihara Corporation has constructed intermediate recycling treatment facilities and composting facilities in Surabaya, Indonesia. Using these facilities, waste pickers have been hired to collect valuables, such as cans and PET bottles from municipal waste, and a business model has been developed for the production of compost from organic waste. Nishihara Corporation has already launched a local subsidiary and is ready for full-fledged business development. At this time, a national fertilizer company, PT Pupuk Indonesia, has shown interest in Nishihara Corporation's business model and is exploring possibilities for collaboration.

Citywide Low-Carbonization Using JCM

Kitakyushu is promoting initiatives for the low-carbon development of entire cities designed around intercity cooperation and making use of the framework of JCM (Joint Crediting Mechanism), as promoted by Japan's Ministry of the Environment. Starting with Surabaya, Indonesia in 2013, Kitakyushu has gradually expanded these initiatives to the target cities of Haiphong in Vietnam, Rayong Province in Thailand, Iskandar RDA in Malaysia, and Phnom Penh in Cambodia.

Kitakyushu's initiatives to formulate large-scale JCM projects

Surabaya, Indonesia: Second largest city in Indonesia with a population of 3 million

<2013-2015> Low-carbon city development project in Surabaya

Target areas: Energy, waste management, transportation, water resources — Participating companies: 13

Conclusion of agreement as environmental sister cities (November 2012)

Haiphong, Vietnam: Leading port city in Vietnam with a population of 1.9 million

<2014-2016> Support for the formulation of the Green Growth Promotion Plan of the City of Haiphong

Target areas: Low-carbon urban planning, energy, waste management, conservation of Cat Ba Island — Participating companies: 10

Conclusion of sister city agreement (April 2014)

Iskandar RDA, Malaysia: Malaysia's second largest economic development zone

<2014-2016> Reduction of greenhouse gas emissions in the Iskandar region

Target areas: Waste-to-energy, energy savings, recycling of industrial waste in industrial estates — Participating companies: 4

Conclusion of Letter of Understanding (LOU) (August 2016)

Rayong Province, Thailand: Leading heavy industrial complex in Thailand with two major industrial parks

<2015-2016> Reduction of greenhouse gas emissions in Rayong Province

Target areas: Waste-to-energy project, energy savings, total recycling in industrial estates — Participating companies: 4

Conclusion of Memorandum of Understanding with the Department of Industrial Works, Ministry of Industry (December 2014)

Phnom Penh Capital City, Cambodia: Cambodia's capital with a population of 1.7 million

<2016> Support for the formulation of the Phnom Penh Climate Change Strategic Action Plan

Target areas: Low-carbon urban planning, energy — Participating companies: 4

Conclusion of sister city agreement (March 2016)

The Case of Haiphong

Kitakyushu concluded a friendship city partnership with Haiphong in Vietnam in May 2009, and has been carring out a number of exchange programs ever since. In April 2014, the two cities developed a sister city agreement to further deepen the friendly exchange.

With the conclusion of this sister city agreement and based on a request from Haiphong, Kitakyushu offered support to Haiphong to create a master plan for the improvement of the overall urban environment, called the "Green Growth Promotion Plan." This plan consists of seven areas, including waste management, energy, water supply and sewage, transportation, and green production, as well as 15 pilot projects which will be conducted by 2020 with a focus on the involvement of local companies in Kitakyushu, including SoftEnergy Controls and Amita Corporation.

Support for the Formulation of the Green Growth Promotion Plan of Haiphong

【Items under deliberation】

(1) Baseline assessment

Main Sectors

Waste	Energy	Transport	Cat Ba Island	Water Supply & Sewage	Rainwater Drainage	Environmental Protection	Green Production
●No proper treatment, disposal, resource recycling	●Necessary to correct the inefficient use of energy	●Problem of air and noise pollution due to traffic congestion	●Lagging improvements for waste management, water supply, and sewage ●Degradation of natural environment	●Overdue improvements to systems. Pressing need to preserve public health	●Problem of flooding during heavy rains	●Serious water quality, air, and noise pollution	●No progress in shift to eco-industries from traditional models

[Check of related items] Forecasts / Existing master plans / Confirm regulations, legislation / Current industrial situation / Understanding market structure

Identify issues in each sector

(2) Formulation of strategy

Set vision, targets for each area, quantitative targets, and evaluation indicators — Plan for consistency with the country's Green Growth Strategy

(3) Detailed policies and measures

Main Sectors <Examination of measures by sector (example)>

Waste	Energy	Transport	Cat Ba Island	Water Supply & Sewage	Rainwater Drainage	Environmental Protection	Green Production
●Separation and recycling of waste ●Proper treatment and recycling of industrial waste	●Support the development and application of energy saving plans based on energy conservation laws	●Urban development centered on public transport (buses, etc.)	●Protection of the natural environment ●Recycling of waste	●Improve water purification and treatment facilities using the Kitakyushu Method	●Flooding prevention measures, such as improvements to levees and pumping stations	●Measures for waste gas in factories ●Improvements to wastewater treatment facilities	●Promotion of cleaner production ●Development of green agriculture

Examine effects of improvement, such as GHG emissions and the environment, generate approximate project costs

(4) Validation of strategies and policies / measures

Verify feasibility and validity of measures, examine validation methodology after application of methodology

(5) Methods to develop contracts and raise funds

Examine project implementation risks, financing, contract methods, and project implementation schedule

(6) Compilation of plan

Green growth promotion plan that is instrumental to the development of the national Green Growth Strategic action plan

15 Pilot Projects under Development

EV Bus Demonstration Project on Cat Ba Island

Cat Ba Island, a site that has also applied to be listed as a World Natural Heritage Site, is a tourist destination visited by over one million people a year. A demonstration project is being promoted on the operation an environmentally-friendly electric bus by utilizing the Ministry of the Environment of Japan's project on low-carbon technology innovation for developing countries. As the first project for Vietnam, various hurdles needed to be jumped over, including obtaining approval from the Prime Minister on import procedures for the electric bus and having the Ministry of Transport create guidelines for the bus to operate on public roads.

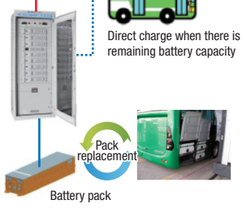
Current initiatives

- EV bus development and demonstration project (first initiative in Vietnam)
  - Conduct of EV bus demonstration operational test linked to photovoltaic power generation on Cat Ba Island
  - Implementation period: February 2017 to March 2020

Future initiatives

- After confirming the impacts of the EV bus, measures will be considered to ban diesel buses on Cat Ba Island
- In order to promote initiatives that contribute to environmental protection, such as the expanded use of EV buses, the introduction of tourism fees to Cat Ba Island was also discussed.

Photovoltaic power generation (CIGS thin film solar cell) 51KW



Direct charge when there is remaining battery capacity

Pack replacement

Battery pack

Battery type	Lithium ion battery
Voltage	576V
Current value	240A (5 packs)

Composting at Trang Cat Waste Disposal Facility

Although the Haiphong Urban Environment Company (URENCO) has developed sorting and composting facilities with Korean ODA, the compost produced could only be used as landfill covering material. For this reason, experts were dispatched from Kitakyushu in November 2015 to provide technical guidance. An analysis of the compost revealed that it meets standards for organic fertilizer specified by agricultural and rural developers in Vietnam. From FY 2017, high-quality compost has started to be produced, with a focus on market waste.

Current initiatives

- Amount of organic waste collected: 50 t/d
- Collection points: Do market, Cau Rao market, Ben Binh market, other Restaurants, hotels

Insertion of organic waste in compost

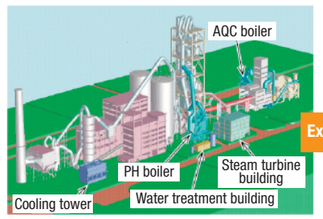
Stirring compost (Steam is generated due to steady fermentation)

Eco-Development in Cement Factory

In Thailand, construction started on a power generation facility for waste heat recovery in a cement plant using JCM's equipment subsidy scheme. The city is currently involved in introducing the same facilities in other cement plants in Haiphong as a form of horizontal expansion. A project to recycle industrial waste as raw materials for cement plants is also underway.

Introduction of recovered waste heat to produce power

- NTT Data Institute of Management Consulting, Kawasaki Heavy Industries
- Siam City Cement (Saraburi Province, Thailand)
- Adopted under the JCM equipment subsidy project in FY 2016
- Amount of subsidy: Approximately JPY 600 million



Expansion

Production of raw materials from industrial waste

Waste emitters (businesses)

Waste

Amita Corporation

Sludge, soot and dust, cinders, waste oil, waste solvent, waste acid, waste alkali, minerals, used catalysts, metal scrap, waste plastic, other

Formulation / adjustments

Cement factory in Haiphong