Low-Carbon Project Development in Surabaya City, Indonesia using Joint Crediting Mechanism (JCM) through City-to-City Cooperation with Kitakyushu City, Japan

Intercity Cooperation with the City of Kitakyushu and Use of the Joint Crediting Mechanism (JCM)
City located near to other Asian nations, rich in nature, and developed as a manufacturing area

Population: 977,000 (2010)
Area: 487.88 km²
GDP: 3,430 billion yen (2010)

Rich nature and branded food materials

Major companies in Kitakyushu area

Nippon Steel & Sumitomo Metal Corporation
Yaskawa Electric Corporation
TOTO Ltd.
Mitsubishi Chemical Corporation
Toyota Motor Corporation-Nissan Motor Co., Ltd.
Mitsubishi Materials Corporation
Kitakyushu Asian Center for Low Carbon Society opened in June 2010.

Utilization of the environmental technologies developed through the solution of pollution problems and manufacturing processes, and the inter-city network established by international cooperation in the past

Accumulating environmental technologies in Kitakyushu City and throughout Japan, for building low carbon societies in Asia through environmental business skills
Development Scheme for Exporting Urban Environmental Infrastructure

Creating a platform for inter-governmental and inter-city cooperation

Country ‘I’ → City ‘S’ → Kitakyushu → Japan

Inter-governmental (G-to-G)
Logistical support through dialogue and consensus
Recognized and supported as a national project

Inter-city (City to City)
Project conference
Business develop through public-private partnerships

Inter-firm
Local firms ← Japanese firms

Development of a comprehensive environmentally-friendly urban master plan

Kitakyushu model activities

Water → Energy → Recycling → Environmental conservation → …

Consensus-building between the public, industry, government, and other stakeholders

Private financial institutions

Social system development

Project discovery

Project development (feasibility studies & demonstrations)

Commercialization (including fundraising)

Overseas infrastructure development

Support from public and private funds

Financial assistance

Public financial assistance

Greater worker interaction

Support for establishing footholds (subsidies, etc.)

Establishing footholds for constructing local government models

Kitakyushu Asian Center for Low Carbon Society
Establish green community development that accommodates the diverse needs of Asian cities and firms.

Comprehensive financial assistance (cross-industry, continuous-process)

• Ministry of Foreign Affairs
• Ministry of Economy, Trade and Industry
• Ministry of the Environment
• Ministry of Land, Infrastructure, Transport and Tourism
• JICA
• NEDO
• JBIC … and more
1. Objective of the Kitakyushu Model

- Kitakyushu, which faced and overcame pollution for the first time in Asia, became a leading environmental city in Japan.
- Kitakyushu is developing the Kitakyushu Model (support tool) that systematically arranges information on the technologies and know-how of Kitakyushu from its experience in overcoming pollution to its quest as an environmental city.
- Kitakyushu is utilizing the Kitakyushu Model to promote the export of customized infrastructure packages to cities overseas, and grow together with Asia.

2. Applications of the Kitakyushu Model

- Support tool to examine future ideal city image and for cities to take appropriate measures and procedures to achieve this.
- Support tool to examine management systems for waste, energy, water and sewage services, and environmental protection.
- Support tool to develop sustainable master plans that integrates waste, energy, water and sewage services, and environmental protection.

---

Organization of the Kitakyushu Model

- Kitakyushu's Story
  - Overcoming pollution
  - History as green city
  - Background of the Kitakyushu Model

- Sustainable urban development (Sustainability Framework)

- Kitakyushu’s case

- Water Management
- Energy Management
- Pollution Management

1. Understand situation
2. Develop strategies
3. Develop specific policies
4. Verify & measure policies
5. Orders & financing
We have carried out 77 projects in close cooperation with 78 Japanese companies in 44 Asian cities.
Transitions in Intercity Cooperation between the Cities of Surabaya and Kitakyushu

**Environmental Cooperation Network of Asian Cities (1997~)**
- **Kitakyushu Initiative Network (2000-2010)**
- **Environmental Cooperation Network of Asian Cities (1997~)**
- **Training on environmental protection: Surabaya city officials (2003, 2004)**
- **Training on composting practices: Surabaya city officials, NGO staff (2005)**

**Human resource exchange**
- **Ir. Tri Rismaharini**
  - Director, Cleaning & Parks Dep’t. (DKP) (2005~)
- **Organization of trainings:**
  - JICA trainings, CLAIR projects, city projects, IGES projects (2006~2011)

**Survey on Proper Treatment of Waste (FY 2002), JBIC**
- **Cooperation Project on Composting of Kitchen Waste (FY 2004-2006), JFGE assistance project**
- **F/S on the Production and Sale of Compost (FY 2007)**

**Technology transfer**
- **Improvement of water quality management capacity (FY 2007-2008) JICA Grassroots Cooperation project**
- **Improvement of decentralized wastewater treatment facilities (FY 2011-2013) JICA Grassroots Cooperation project**
- **F/S on JCM Projects towards Environmentally Sustainable Cities in Asia : IGES, other (2013~)**

**System development**
- **Support for the development of master plans in each sector**

**Policies**
- **New Growth Strategy (2009.12~)**
  - JICA Partnership Program (PPP, BOP, support for small- and mid-sized businesses)
- **Kitakyushu Asian Center for Low Carbon Society est. (2010.6)**
  - Reduction of CO₂ emissions by 150% in the Asian region (2050) (Eco-Model City Action Plan (2009.3))
- **Green Sister Cities agreement (2012.11)**
- **Joint Statement on Strategic Environmental Partnership (2011.3)**

**Intercity cooperation framework**
- **Surabaya Vision Plan (2005-2025)**
- **Mr Satriyo Soesanto**
  - 2014
- **Mr. Gingin Ginanjar**
  - 2012
- **Cogeneration and energy-saving project:**
  - Nippon Steel & Sumikin Engineering, other (2012.3~)
- **Waste treatment project:**
  - Nishihara Corporation (2012.12~)
- **Waste power generation project:**
  - Hitachi Zosen, other (2014.6~)
- **Sewerage system improvement project:**
  - Original Engineering Consultants, other (2014.6~)
  - Kikai Engineering, other (2014.5~)
- **Drinking water supply project in areas without electricity:**
  - Suido Kiko Kaisha, other (2011.11~)
- **Drinking water supply project:**
  - Ishikawa Engineering, other (2014.5~)
- **Training for Surabaya city staff: CLAIR project**
Exporting Green Cities (Surabaya)

**Development of a green city master plan**
Comprehensive urban development plan that incorporates the formation of a social system and the training of human resources in urban development

**Reinforcing the foundation that is the source of growth**
(local governmental strength, civic-mindedness, technological strength)

**Intercity Cooperation**
(Learning together/mutually enhancing & intensifying linkages/expanding cooperation)

**Application of Kitakyushu Model**
Kitakyushu City systematically arranges information on the technologies and know-how of Kitakyushu from its experience in overcoming pollution to its quest as an environmental city

**Export of green cities**

- Waste treatment
- Maintenance/improvement of sewage systems
- Studies on quantification techniques to reduce CO2 emissions
- Purification of tap water
- Co-generation and energy saving
- “Green Sister City agreement” was signed in November 2012 between Surabaya and Kitakyushu.

Exporting Green Cities (Surabaya)
Project on the Development of Green Growth Action Plan in Haiphong

**Japan-side**

**City of Kitakyushu**
- Project Management: IGES
- Kitakyushu Asian Center for Low Carbon Society

**Vietnam-side**

**City of Haiphong**
- People’s Committee
- Dept. of External Affairs, Dept. of Planning and Investment

**Conclusion of Sister City Agreement (April 2014)**

**Agreement for Friendship and Cooperation (April 2009)**

**Reduction of CO₂ emissions by implementation and expansion of pilot project: ~120,000 t/year (target year: 2020)**

**Low-carbon City Development**
- Preparation of Green Growth Action Plan

- **Nikken Sekkei Civil Engineering Ltd.**
- M. I. Consulting Group Corp.
- DEA, DPI, DONRE, DOC, DOIT, DOT, DARD, HEZA

- NTT DATA Institute of Management Consulting Inc.
- University of Kitakyushu
- NTT Facilities Inc.

**Energy sector**
- Generation of power from waste heat in cement plants, energy savings in commercial facilities and factories, conversion of street lighting to LED, etc.

- **Energy Conservation Center (ECC)**
  - Manufacturing plants
  - Large-scale buildings and offices, Infrastructure

**Solid waste sector**
- Separation and composting of household waste, manufacturing of raw materials for cement from industrial waste, etc.

- **NTT DATA Institute of Management Consulting Inc.**
  - Nishihara Co., Ltd.
  - Amita Co., Ltd.

- DOC, DONRE, HEZA, URENCO, Local companies

**Conservation of Cat Ba Island**
- Comprehensive resource recycling (production of biogas and solid fuel, use of liquid fertilizer), project on generation of solar power in agri-tourism areas

- **NTT DATA Institute of Management Consulting Inc.**
  - Amita Institute for Sustainable Economies Co., Ltd.
  - Other companies, etc.

- People’s Committee, DOC, DONRE, DCST, URENCO, Cat Hai District, and any other related stakeholders
Support for Development of Green Growth Promotion Plan in Haiphong

**Check of Related Items**

<table>
<thead>
<tr>
<th>Main Sectors</th>
<th>Other Sectors</th>
</tr>
</thead>
<tbody>
<tr>
<td>Waste</td>
<td>Water &amp; Sewage</td>
</tr>
<tr>
<td>Energy</td>
<td>Rainwater Drainage</td>
</tr>
<tr>
<td>Transport</td>
<td>Environmental Protection</td>
</tr>
<tr>
<td>Cat Ba Island</td>
<td>Green Production</td>
</tr>
</tbody>
</table>

**Identify issues in each sector**

1. **Baseline assessment**
   - Forecasts
   - Existing master plans
   - Confirm regulations, legislation
   - Current industrial situation
   - Understanding market structure

2. **Formulation of strategy**
   - Set vision, targets for each area, quantitative targets, and evaluation indicators
   - Consistency with GGS

3. **Detailed policies & measures**
   - Examine project implementation risks, financing, contract methods, and project implementation schedule
   - Examine project implementation risks, financing, contract methods, and project implementation schedule

4. **Validation of strategies and policies / measures**
   - Examine effects of improvement such as GHG emissions and the environment, generate approximate project costs
   - 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 GGS action plan

**Items under deliberation**

<table>
<thead>
<tr>
<th>Waste</th>
<th>Energy</th>
<th>Transport</th>
<th>Cat Ba Island</th>
<th>Water &amp; Sewage</th>
<th>Rainwater Drainage</th>
<th>Environmental Protection</th>
<th>Green Production</th>
</tr>
</thead>
<tbody>
<tr>
<td>• No proper disposal, treatment, resource recycling.</td>
<td>• Necessary to correct inefficient use of energy.</td>
<td>• Air and noise pollution due to traffic congestion is a problem.</td>
<td>• Waste, water, and sewage management lags behind. • Degradation of natural environment</td>
<td>• Improvements to systems are overdue. Preservation of public health is pressing need.</td>
<td>• Floods during heavy rain are an issue.</td>
<td>• Measures to deal with waste gas in factories. • Improvements to wastewater treatment facilities.</td>
<td>• No progress in shift to eco-industries from traditional models.</td>
</tr>
</tbody>
</table>

**Main Sectors**

- **Waste**: Separation and recycling of waste.
- **Energy**: Support development of energy conservation plans based on energy conservation laws.
- **Transport**: Support development of urban development centered around public transport (buses, etc.).
- **Cat Ba Island**: Protection of natural environment. • Waste recycling.

**Other Sectors**

- **Water & Sewage**: Improve water purification and treatment facilities using the Kitakyushu Method.
- **Rainwater Drainage**: Flooding prevention measures such as improvements to levees and pumping stations.
- **Environmental Protection**: Measures to deal with waste gas in factories. • Improvements to wastewater treatment facilities.
- **Green Production**: Promotion of cleaner production. • Development of green agriculture.
Haiphong has the largest cluster of iron foundries in Viet Nam

With over a 1000-year history, the district of My Dong is referred to as the “cast metal village.” Today, Japanese companies, which have commissioned the production of casting products to China, are now searching for new factories.

My Dong District

140 casting companies

Existing cast metal industrial estate (22 companies)
Comparatively large-scale factories

4 companies relocated, established facilities

New industrial estate: 20 companies
Remaining 16 companies relocated or established facilities from other parts of My Dong district, other than from the existing industrial estate.

【Manufactured materials】
・Iron (FC, FCD): 90 companies
・Aluminum alloys: 30 companies
・Copper alloys: 20 companies

【Main products】
・Pump parts
・Sewing machine parts
・Parts for water & sewage

Introduction of Highly-efficient Electric Furnaces in Iron Foundries

Most factories (120) use coal furnaces. There are only 20 factories that use electric furnaces.

Companies using coal furnaces want to introduce electric furnaces to improve quality and production, and cut costs. Companies also recognize that without the introduction of electric furnaces, they will not survive in the market.

Most electric furnaces are older models. Although inexpensive, there have been many cases of furnaces malfunctioning, excessive consumption of electricity, and short service life (about 8 years).

Companies want to use Japanese electric furnaces that are highly efficient had have a long service life. However, many companies have abandoned this idea because of the high cost. Recently, manufacturers from other countries have come to market their own equipment.

If production quantity increases and subsidies are available, Japanese companies could use this opportunity to introduce electric furnaces to companies that use coal furnaces, as well as for companies that currently own electric furnaces.
Development of Comprehensive Resource Recycling System on Cat Ba Island

**Solid fuel facility**
- Fuel
- Boiler
- Plastic
- Pruned branches
- Waste paper/textiles

**Tourism industry**
- Application to be listed as a World Natural Heritage Site

**Candidates for use of solid fuel**
- Factories producing fish meal, ice.
- Coal prices are high and unstable.

**Cement factory**
- Recycling (sales)

**Biogas facility**
- Liquid fertilizer
- Electricity
- Animal manure
- Organic waste
- Sludge from wastewater, septic tanks

**Generated waste**
- Landfilled: 40～65t/day. More than double the amount from 10 years ago.
- Composition is unclear. ⇒ Survey required.

**Tourists**
- Environmental protection tax

**Marine products**

**Suitable for use of solid fuel**
- Factories producing fish meal, ice.
- Coal prices are high and unstable.

**Tourism**
- Purified water

**Agriculture**
- Farmland: ~100ha.
- Lack of fertilizer, chemical fertilizers are expensive.

**Ecological agriculture**

**Cans, bottles, PET bottles**

**Other waste**

**Cans, bottles, PET bottles**

**Other waste**

**Residue from agricultural products**

**Fishery residue**

**STPs, septic tanks**
- STP located in town area.
- Sewage sludge is landfilled (~2.5m³/d)

**Survey required to assess situation, needs**

**MRV methodology, Examination and development of PDD**

**Source:** AMITA Institute for Sustainable Economies Co.,Ltd.
This project aims to develop the Large-Scale GHG Emissions-Reduction Project through the application of “Fujisawa-model by Panasonic”, “Kitakyushu-model” and “ESCO business-model”, in the field of residential area, industrial area and individual buildings, based on LCSBP in Iskandar development region, Malaysia.

<table>
<thead>
<tr>
<th>Goals, Methods, Plans of the project</th>
<th>Co-proposer</th>
<th>Goals</th>
<th>Methods</th>
<th>Research plan</th>
<th>Partners</th>
<th>日本総合研究機関 リミテッド</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Panasonic Corporation</td>
<td>● GHG emissions reduction in the residential area</td>
<td>● Developing the projects and systems based on the “Fujisawa model” in order to realize GHG emissions reduction in the residential area</td>
<td>● Communicating two developers Participating the basic design and details design in order to develop the Low carbon residential area, based on the research results of FY2014</td>
<td>● Developer A ● Developer B</td>
<td></td>
</tr>
</tbody>
</table>
| | Kitakyushu City | ● GHG emissions reduction in the industrial area | ● Developing the relationship and cooperation based on the “Kitakyushu model” in order to realize GHG emissions reduction in the industrial area | ● Developing the round table for discussion in order to cooperate between Kitakyushu city and Pasir Gudang city ● Identifying the field for realizing the Low carbon industrial area | ● Pasir Gudang city | | |}
| | Japan Facility Solutions Inc. | ● GHG emissions reduction on the individual buildings | Developing the ESCO-business in order to construct the system of GHG emissions reduction on the individual buildings | Implementing details energy conservation diagnosis, developing the methods of verification of benefits and the standard of form of Agreement | TNB Energy Services | | |
Green & Healthy City of Pasir Gudang

1. Green Industry
   - Cleaner Production
   - Efficient energy management
   - Pollution prevention
     (wastewater/waste gas measures)
   - Recycle industrial waste
   - Manufacture eco-products

2. Solid Waste Management
   - Reduce urban waste (emission stages)
   - Promote recycling
   - Proper treatment of waste (waste-to-energy)
   - Secure final disposal sites
   - Illegal dumping prevention measures

Kitakyushu Model
Offering solutions

3. Carbon Sequestration
   - Promote spread of public transport systems
   - Introduce low-emission vehicles
   - Energy-saving homes and offices
   - Introduce renewable energies
   - Climate change measures

4. Green Community
   - Urban greening
   - Protect the natural environment
   - Environmental education & learning
   - Practice eco-lifestyles
   - Develop monitoring systems
In addition to international environmental cooperation, when it comes to international environmental business development, our hope is to see the advancement of a uniquely Japanese approach, different from that of other countries, that will respect and bring joy to local residents.