

**Asia-Pacific Environmental Innovation Strategies (APEIS)
Research on Innovative and Strategic Policy Options (RISPO)
Good Practices Inventory**

[Kitakyushu Eco-Town Project](#)

Summary of the Practice

Keywords: Waste management, urban environment

Strategy: Inter-boundary market for recyclable materials

Environmental areas: Waste management

Critical instruments: Economic instruments, Partnerships, Technologies

Country: Japan

Location: City of Kitakyushu

Participants: City of Kitakyushu, private companies in recycling industry, academic organizations, Ministry of Economy, Trade and Industry

Duration: First stage of this project: FY1997–2002, second stage: FY2003–2010

Funding: City of Kitakyushu, Ministry of Economy, Trade and Industry

Background:

The Eco-Town Project in Japan was introduced by the Ministry of Industrial Trade and Industry (MITI, which later became the Ministry of Economy, Trade, and Industry in 2001(METI)) in 1997. The project aims to promote the Zero Emission Society at local and national levels by creating new environmental towns at the local level and introducing advanced technologies for recycling. METI promotes this project to local governments and provides subsidies for the construction of high-tech model recycling facilities and for marketing efforts in the environmental industry. METI has already approved Eco-Town projects in 14 municipalities.

Kitakyushu Eco-Town Project, located in the entire eastern part of the Hibiki landfill area in the city of Kitakyushu, is the first of the approved projects and the most symbolic. The project is composed of the Comprehensive Environmental Industrial Complex, the Hibiki Recycling Area, and the Practical Research Area.

The Comprehensive Environmental Industrial Complex enables companies to handle and distribute recyclables generated from a broad area. It could be used as a hub for the material-cycle of individual industries and in that way create a recycling chain among them.

The Hibiki Recycling Area supports small- and medium-sized enterprises that are venturing into the environmental industry by preparing business sites for long-term lease.

The Practical Research Area acts as a centre for environmental industries in the city by concentrating organisations that engage in research and development on cutting-edge environmental technologies in this area.

As of 2003, 36 organisations can be found at this site. In August 2002, "the Eco-Town Project Second Stage Plan" was developed and is being run under the 3R policy of Reduce, Reuse, and Recycle. While the first stage of this project had focused on the "Recycle," the second stage emphasises "Reuse."

Objectives:

Kitakyushu had been one of the foremost areas in Japan for heavy industries like iron manufacturing, and gained valuable experience in overcoming serious environmental pollution later on. After a period of

high economic growth during the 1950s through the 1970s, heavy industries such as iron manufacturing in Kitakyushu declined due to intensive competition in the iron industry on the international market. The miserable environmental pollution in the city has diminished over time through considerable effort in getting back the clear sky and the blue sea. By way of this experience, Kitakyushu has a clear strategy for developing the city through promoting a structural shift from heavy industries to environmental industries. The need for resource efficiency and appropriate waste management has been increasing due to the scarcity of raw materials and landfill areas. Thus, the Japanese government has advocated and promoted various activities associated with a recycle-based society. The Kitakyushu Eco-Town Project was established under this strategy and in this context.

Specifically, the project aims to do the following:

- Develop and promote the environmental industry, particularly the recycling business, as a new industry in the city
- Establish a material-cycle society through collaboration among industries, local government, and consumers

Description of the activity:

The Kitakyushu Eco-Town Project occupies the entire eastern part of the Hibiki landfill area in the city of Kitakyushu, which borders the Hibiki Nada Sea. The strategy to boost the presence of environmental industries in the city includes linking together academic research, demonstrative and applied research, and businesses in the environmental industry. The project consists of the Practical Research Area, Hibiki Recycling Area, and the Comprehensive Environmental Industrial Complex.

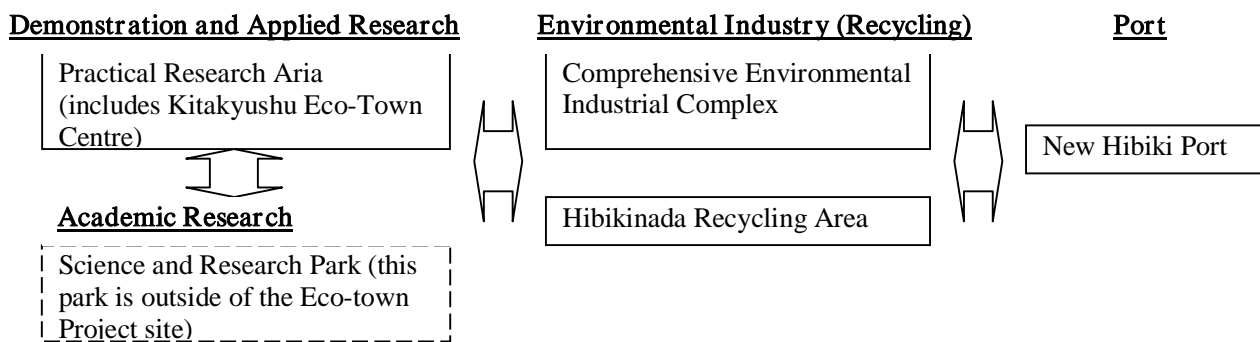


Figure 1: The Composition of the Kitakyushu Eco-Town Project

1. The Comprehensive Environmental Industrial Complex

This area is located in the Hibiki-Nada area in the coastal zone of the city. It aims to create a circulating-system for energy and materials by concentrating recycling industries into this site. Table 1 shows the companies located in this area (as of March 2004).

Table 1: Recycling Activities in the Comprehensive Environmental Industrial Complex

Project	Operating Company	Outline
Plastic PET Bottle recycling Project	Nishi-Nippon PET-Bottle recycle Co., Ltd.	Cities, towns, and villages are imposed to sort and recycle the plastic (PET) bottles. The recycling is commissioned to the company by the municipalities.
Office equipment Recycling Project	Recycle Tech Co., Ltd.	Discarded office equipment such as copiers, fax machines, printers, and computers is disassembled and sorted into categories. High-quality parts and materials are recovered for reuse.
Automobile Recycling Project	West Japan Auto Recycling Co.	High-quality iron scrap, recyclable materials and parts dismantled from automobile are salvaged for reuse. Oil and Freon gas from the used automobile are treated properly.
Home Appliance Recycling Project	Nishinippon Consumer Electronics Recycle Co., Ltd.	High-quality recyclable materials and parts dismantled from home appliance such as air conditioners, televisions, refrigerators, and washing machines are recycled. Freon gas from the used home appliance is treated properly.
Fluorescent Tube Recycling Project	Japan Recycling Light Technology & System	Separating used fluorescent light tubes, glass, and metallic substances mainly from office waste and recycling those materials.
Medical Wastes Recycling Project	Aso Mining Co.,Ltd. Kitakyushu Office	Used medical instruments are pulverized, sorted after being treated at high frequency, and made into collection vessels. They are also recycled into solid fuel and concrete materials.
Construction Waste Recycling Project	Hibiki Ecosite	Waste discarded from construction sites is sorted by hand or machine and recycled into materials such as concrete, wood and metals. Waste wood is shredded and recycled into board-manufacturing materials. Waste plasterboard is also recycled.
	Nakayama Recycle Industry Co., Ltd.	Waste discarded from construction sites is sorted by hand or machine and recycled into materials such as concrete, wood and metals. Waste plasterboard and plastic are also recycled.

Source: The author created this table based on the pamphlet, “KITAKYUSHU ECO-TOWN PROJECT, March 2004, The City of Kitakyushu.”

2. Hibiki Recycling Area

This area located next the Comprehensive Environmental Industrial Complex aims to support small and medium sized recycling companies advance to environmental industries by renting land to them for a certain term. Most of the small & medium sized recycling companies located at this area is local companies which cover the local market concerning recycling. On the contrary, companies located at the Comprehensive Environmental Industrial Complex cover broader market for recycling than the one covered by the small & medium sized recycling companies. This project site is categorized the Automobile Recycling Zone and the Frontier Zone. As of March 2004, following companies have been located in this area.

Table2: Recycling Activities in the Hibiki Recycling Area

Project		Operating Company	Outline
Automobile Recycling Zone	Automobile Recycling Project	Kitakyushu ELV Cooperative Association	Seven automobile scrapping companies in Kitakyushu City will move as a group to achieve more efficient recycling of used automobiles.
Frontier zone	Cooking Oil and Fat Recycling Project	Kyushu and Yamaguchi Oil & Fat Cooperative Association	Used cooking oil and fats from the food industries are refined and made into construction paints and feed for animals.
	Detergent and Organic Solvent Recycling Project: Waste Plastic Recycling Project	Takano Kosan Co., Ltd.	Organic solvents produced through washing semiconductors and refining chemicals and medicines are distilled and made into recycled, high purity solvents.
	Project for Recycling Used Paper into Livestock Litter	Nishi-Nippon Paper Recycle Co., Ltd.	Recycling, after shredding of used paper from offices, into livestock litter.
	Empty Can Recycling Project	Kitakyushu Akikan Recycle Station	Empty cans are separated into steel and aluminum. High purity and quality steel manufacturing material, which makes the “Can to Can” concept possible, is produced.

Source: The author created this table based on the pamphlet, “KITAKYUSHU ECO-TOWN PROJECT, March 2004, The City of Kitakyushu.”

3. The Practical Research Area

This area aims to promote the research and development of cutting-edge environmental technologies, by mobilising various research organizations to demonstrate recycling and waste treatment technologies. In this area, Fukuoka University’s Graduate School of Engineering Recycling and Eco-Technology Research Centre was established in April 1998. It has had an important role in attracting other research organizations from the private sector. This centre, which deals with environmentally sound waste treatment technologies and recycling technologies, has taken a leadership role for collaborative research and development, and coordinating collaborative research projects. As of March 2003, 19 research organizations from various fields, such as universities and private companies, have located here, and about 250 researchers, including part-time researchers, were engaged in the research projects listed in Table 3.

Table3: Research Activities in the Practical Research Area

Research Project	Research entity
Fukuoka University Institute for Resource Recycling & Environmental Pollution Control System	● Fukuoka University in association with Kyushu University, Kyushu Institute of technology, Saga University, private enterprises, and others
Dome-shaped Waste Disposal Sites Experiment and Research Facility	● Fujita Corp.
Eco-Town Research Demonstration Facility, Kyushu Institute of Technology	● Shirai Laboratory, Graduate school of Kyushu institute of Technology
Research Facility for the Development of Leak-Proof Waste Disposal Sites	● Yokogawa Bridge Corp.
Fly Ash Neutralization Research Facility	● Miyoshi Oil & Fat Co. Ltd, Fukuoka University, Environmental Technology Service Co. Ltd.
Research Facility for Waste Neutralization System	● Wash-out Waste Landfill System Research Group represented by Shinko Pantec Co. Ltd.
Research Demonstration Facility for Technology Development of Final Disposal Site Stabilization in the Early Stage Research Demonstrations, connected with stabilization technology utilizing on-site	● Nishinohon Environment Research Co. Ltd, Fukuoka University, Kubota Corporation
Nippon Steel Corporation, Kitakyushu Environmental Technology Centre	● Nippon Steel Corporation
Research Demonstrations concerned with Producing Lactic Acid from Food waste	● Kitakyushu Foundation for the Advancement of Industry Science and Technology, Ebara Corporation, Organo Corporation, Environment Technos Co. Ltd., Electric Power Development Co. Ltd, Musashino Chemical laboratory, Ltd.
Research Demonstrations concerned with Empty Can recycling Utilising Induction Heat Type Dry Distillation Furnace	● R-Nissei Co. Ltd, Nisei kogyo Co. Ltd., Fuji Electric, Holdings Co. Ltd.
Recycling Project for Tofu and Other Food Residue	● Kitakyushu Food Recycling Cooperative Association
Styrene Foam Recycling Project	● Nihi-Nihon Styrene Foam Recycle Co. Ltd.
Industrial Waste Research Facility, Kitakyushu Eco-Town Centre	● Kitakyushu Eco-Town Centre
Development of Advanced Recycling Technology for Shochu (Distilled Sprits) Lees	● Kyushu Medical Co. Ltd.
Research Demonstration Facility for Advanced Reuse Technology of Disposed FRP Fishing Boats	● Fisheries Research Agency
Research Demonstration Facility for the Development of Cleaning/Recycling Technology for Toxic Ash	● Sumitomo Metal mining Co. Ltd.

Source: The author created this table based on the pamphlet, “KITAKYUSHU ECO-TOWN PROJECT, March 2004, The City of Kitakyushu.”

4. Kitakyushu Eco-Town Centre

The environmental learning centre was established in June 2001 to promote the dissemination of the Eco-Town Project's activities and to raise awareness of the material circulating society. The centre also serves as a core facility for comprehensive support of the Eco-Town Project. The following are functions of the Eco-town Centre:

1. Environmental learning for citizens
2. Implementation of environmental training/seminars
3. Visitor support
4. Support of research demonstration activity
5. Comprehensive environmental management for the Eco-Town project
6. Exhibition of environmental/recycling technology
7. Exhibition/introduction of the environmental industry in the Kitakyushu area

5. The Second Stage Plan area

In August 2002, the "Eco-Town Project Second Stage Plan" was adopted to further endeavour toward a material circulating society. The feature of this plan is that its emphasis is the promotion of reusing rather than recycling. Table 4 outlines this plan and on-going projects.

Purpose: Being the stronghold city for the promotion of international resource circulation and the environmental industry in Asia

Proposed year for completion: FY2010

Project Area: was expanded to cover the entire eastern part of the Hibiki Landfill area

1. Emphasized projects: Substantial research demonstration area
2. Promotion of reusing and rebuilding of business establishments
3. Strengthening training for human resources
4. Business expansion utilizing the existing industrial infrastructure
5. Developing the next generation of the environmental industry utilizing new energy technology, micro/nano technology, etc.

Table 4: On-going projects:

Project	Operating Company	Outline
Wind Power Generation Project	NS Wind Power Hibiki Co.	The first wind power generation business project in Japan. The Power generation capability is the largest class in western Japan.
Pachinko Machine Recycling Project	Yuko Repro Co., Ltd.	Pachinko and slot machines discarded from pachinko parlours are sorted in a highly systematic manner. The machine parts are reused and the metal and wood materials are collected.
Waste Wood/Plastic Recycling Project	Eco-Wood Co., Ltd.	Waste wood and plastic are mixed together to produce highly water-/weather-resistant construction materials.
Printer Toner Cartridge Reuse Project	Beston Kitakyushu Co., Ltd.	Used toner cartridges are collected, disassembled, cleaned, and then reassembled. Recycled toner cartridges are sold after being refilled with toner and undergoing a quality inspection.
Beverage Container Recycling Project	Coca-Cola West Japan Co., Ltd.	Beverage containers are collected from company-owned trash cans installed next to vending machines. The containers are sorted/collected by material, such as aluminum and PET bottle, and supplied to steel manufactures as recycled material.

Source: The author created this table based on the pamphlet, "KITAKYUSHU ECO-TOWN PROJECT, March 2004, The City of Kitakyushu".

6. General Recycling Port Construction

In May 2002, Kitakyushu Port (Hibikinada Area) was designated as a recycling port by the Ministry of Land, Infrastructure, and Transport. The Recycle Port system was established in the 2002 fiscal year by the ministry in an effort to develop a comprehensive material-cycle network system. In total, 18 ports have already been designated as material-cycle based ports by the ministry. The designated ports garner the following support services to convert them into bases for material recycling.

a. The provision of guidelines for dealing with recyclable materials in ports

There are some differences of criteria and/or procedures in the treatment of recyclable materials among authorities of ports and local governments. Such differentiation has been an obstacle in promoting the efficient movement of recyclable materials in Japan. In order to get rid of this obstacle, the ministry provides guidelines for dealing with recyclable materials in ports.

b. The promotion of linkages between public and private sectors

The recycle port as a material-cycle base needs a concentration of various kinds of companies such as manufacturing, transportation businesses, etc. Linkage among these companies and linkage between the private sector and public sector is essential to promote the concentration of various companies into this area and to establish an efficient material-cycle network. Therefore, the ministry promotes such linkages at the national level as well as the local level. An active exchange of information on the establishment of a material-cycle system at the local level and the national level is further enhanced through such linkages.

c. The promotion of facility development for recycling in the designated port

The ministry provides support to a private company's development of incidental port facilities such as trans-shipment and storage for recyclable materials. In addition, the ministry enhances exclusive wharfs for recyclable materials and related infrastructures in the designated port.

7. The Core facility for Zero-Emissions in the Environmental Industrial Complex

Industrial waste—mainly residual substances from recycling and automobile shredder dust—discarded by enterprises in the Eco-Town area, are appropriately processed. In this process, molten material is recycled, and power generated during the process is supplied to enterprises in the Eco-Town area. (Operated by: Kitakyushu Eco Energy Co., Ltd.)

Critical Instruments

Overview

The success of this Eco-Town project relies on the following instruments, particularly the subsidies that were provided by the Ministry of Industrial Trade and Industry for promoting the recycling industry.

Economic instruments

The Eco-town project in Japan was introduced by the Ministry of Industrial Trade and Industry (MITI, transferred to the Ministry of Economy, Trade and Industry in 2001(METI)) in 1997, in order to promote the Zero Emission Society at the local and national levels. The basic concept of this project is to promote a material-cycle society through the creation of new environmental towns at the local level and introducing advanced technologies for recycling.

METI's subsidies of this project provide assistance for the construction of high-tech model recycling facilities such as eco-cement manufacturing plants and PET bottle recycling facilities by private companies and other bodies. Moreover, METI provides assistance for (1) environmental industry marketing efforts such as the holding of environmental trade fairs, technology exhibitions, and forums for joint business negotiations; (2) information provision projects involved in such things as providing

recycling information to local residents and related businesses; and (3) the holding of environmental lectures and training courses and the provision of environmental guidance.

For utilising these subsidies, local government bodies have to draft promotion plans (Eco-Town Plans) and these plans have to be approved (approvals were jointly given by METI and the Ministry of the Environment). To maximize the effect of this subsidy system, it is important for METI to carefully select innovative facilities and systems in “recycling industries” to grant subsidies. Through this system, METI intends to further promote the private sector's initiatives in developing the recycling industry.

Partnerships

The fact that Kitakyushu City used to be one of the major areas in which heavy industries were concentrated, and which have produced fundamental materials such as iron and chemical materials, has fortunately brought kinds of seeds for blooming the environmental industries in the city. For example, there are various networks between manufacturers formally and informally, horizontally and vertically, that were inherited from previous activity. Such networks have contributed to a reduction of transaction costs and communication costs in terms of industrial materials business, and the accumulation and sharing of related technologies. These have become part of a significant centre for environmental industries in the city. Specifically these networks have also contributed to networking for environmental business industries, and the creation of eco-markets.

Technologies

METI's subsidies of this project have performed an excellent role for attracting the companies that can develop high-tech model recycling facilities. Hence, many important technologies have converged into this area. In addition, the same technology that is used by heavy industries in producing fundamental materials has been fostered and utilized in environmental technologies. The strong nexus fostered among various organizations in the heavy industrial complex has become an integral part of the centre for R&D in the environmental industry.

Impacts

Zero Emissions Environmental Industries

As shown in the previous section, a considerable number of organizations engaged in the environmental industry have converged into the project site. Since individual organisations have attained advanced technology or excellent capability in R&D, the site has become the largest and most cutting-edge Eco-Town in Japan. Kitakyushu city has been successfully transformed from being a major area of heavy industry into one of the foremost cities of the environmental industry. To promote the resource-circulating society, the creation of further interactions between various organizations on the site are needed to establish a recycling flow among the organizations as well as linkages between businesses and R &D.

Symbol Project of the City

Kitakyushu City has been promoting international environmental cooperation among major cities in Asia, using its wisdom and experiences to tackle and overcome serious environmental pollution. Thus, Kitakyushu City has weighed environmental policy conventionally, and has been establishing itself as a kind of brand name for an environmentally sound city. Since the Eco-Town Project attracted much attention from internal and foreign sources, this characteristic has been further strengthened. In terms of economic impact, 50,200 million yen was invested, seventy percent of which was private investment, and employment increased by over 1,000. Moreover, 109,300 million yen was invested from fiscal year 1998 to fiscal year 2003.

Lesson Learned

The concept of this Eco-Town project includes the promotion of the environmental industry, R&D in environmental technology, and networking for international resource recycling. It may be said that this project was well designed and established with a good combination of the above concepts, drawing on the city's prior exposure to heavy industry and its experience in overcoming serious environmental pollution. Specifically, heavy industry has a huge potential supply capacity for recyclable materials, the experience of overcoming the environmental pollution has seeded a certain degree of environmental technologies, and the heavy industry itself has a potential demand for recyclable materials. Predictably, the enterprise that has engaged in heavy industry knows very well what kind of recyclable materials are needed or generated, and where such recyclable materials are supplied or demanded. In short, they have the best position for obtaining market information on recyclable materials. The recognition of this advantage has also encouraged other cities that have faced stagnation of their heavy industries. In this respect, similar cities in developing countries can incorporate comparable forms of this project.

Although the combination of environmental industry promotion, R&D for environmental technologies, and networking for international resource recycling was very attractive idealistically, the actual linkage between these three segments has not appeared to have a synergetic effect among companies on the site. The synergy within companies in the comprehensive environmental industrial complex, Hibiki Recycling Area, and the Practical Research Area is also a critical challenge for further enrichment of this project.

Potential for Application

As emphasized in previous sections, the condition that a city happened to be a major centre for heavy industry is a key factor for a successful Eco-Town project and for enhancing the environmental industry. In addition, the fact that this city has one of the major international ports in Japan is also a critical factor in the promotion of international resource circulation. Since recyclable materials are very much related to heavy industries and they are usually transported by ship, then an industrial city located in a coastal area with an international port has the most potential for the application of this type of project.

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URL: <http://www.kitaq-ecotown.com/index.html> (Japanese Only)

References

KITAKYUSHU ECO-TOWN PROJECT (Pamphlet), The City of Kitakyushu, March, 2004.
IMANAGA, Hiroshi, Kitakyushu Eco-Town Project: aim at the Sustainable society; Environmental Research Quarterly March 2005/No.136
Kitakyushu-City Renaissance Plan's Evaluation Report, Evaluation Research Team for the Kitakyushu City Renaissance Plan, March 2003.
Source: <http://www.meti.go.jp/english/information/data/cemeasuree.html>
Source: <http://www.meti.go.jp/english/topic/data/eEcotowne.html>

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