

Contribution to the Kitakyushu Eco-Town Project by Yawata Works, Nippon Steel Corporation

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Abstract

In Japan, accompanying the rapid industrialization since 1960s, many local cities have been taking a course of developing their economy by developing industries, giving importance to the manufacturing industry. In the meantime, those cities were subjected to environmental issues opposed to people's life as pollution problems and thus have been making efforts to keep harmony between the growth of industry and the development of society by controlling the production processes of industry. The global environmental issues that came to arouse public attention in the 1990s have been requiring harmonious solution that might deny urban civilization, that is, a struggle between a society based on an industrialized consumption system and its sustainable development. At the same time, local industrial cities laying themselves under economic globalization are required to establish a vision of a new industrial city that promises sustainable development. In Kitakyushu City, "Kitakyushu Eco-Town Project" has been promoted since 1996, aiming to be an "advanced city of environment-related industries", and Yawata Works of Nippon Steel Corporation took part in the project as one of the members of Kitakyushu City Environment-related Industries Committee at the stage of its formulation and has been engaged in embodying a part of the project. The Kitakyushu Eco-Town Project is obtaining concrete results for the first time in Japan, which is aiming to be a state of recycle-oriented society. This report introduces the addressing of Nippon Steel Corporation relating to the history and details of the project.

1. Introduction

In Japan, where rapid industrialization has been taking place since the 1960's, many local cities have also grown into industrialized cen-

ters with emphasis placed on the manufacturing industry. The environmental issues that have emerged in this process are pollution-related ones that confront civic life, making it indispensable to try to harmonize them with economic development, through the process

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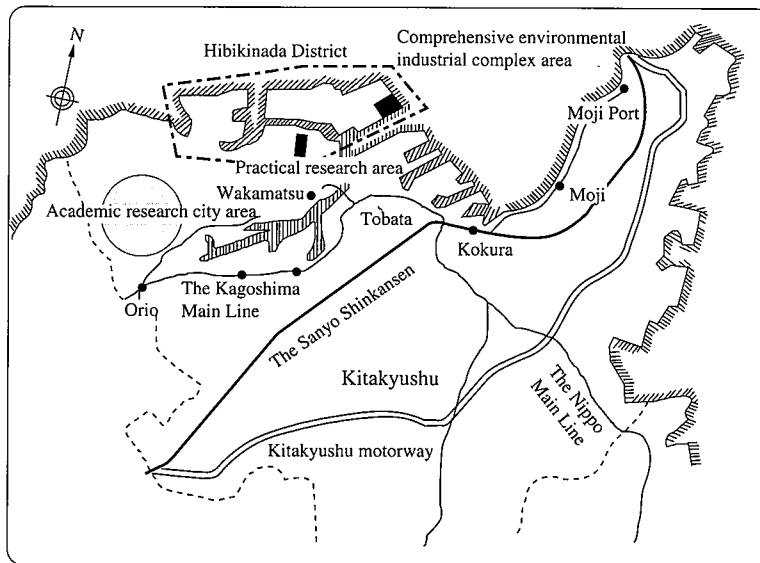


Fig. 1 Map of the Kitakyushu Eco-Town area

of pollution control. The global environmental issues that came to the fore in the 1990's can be considered a conflict between the civilization of industrialized society and its sustainable development, a conflict requiring harmonious solution to a strain on urban civilization including the civic life. To the local industrialized cities exposed to the globalization of economy as well, they are burdened with structuring the image of a new industrial city for sustainable city development.

2. Formulation of the Kitakyushu Eco-Town Project

In Kitakyushu City, "The Kitakyushu Eco-Town Project" is under way. Its aim since 1996 is to become "an advanced city with environment-related industries." With Yawata Works of Nippon Steel Corporation taking part in the Kitakyushu City Environment-related Industry Committee as its member from the stage of project planning, it has also been involved in this project from aspect of its maintenance and has offered a site to materialize part of the project in the implementation stage. The Kitakyushu Eco-Town Project has been achieving concrete results at an early stage in our country which is trying to build a recycle-oriented society. This paper summarizes the above processes and their contents along with how Nippon Steel Corporation has tackled this project.

2.1 General Development Plan of the Hibikinada District and Environment-related Industry

The land in the northern coastal area of Kitakyushu City which faces Hibikinada and stretches to the west of the Shimonoseki Straits that separates the island of Kyushu from the island of Honshu, has been strenuously reclaimed since the 1940's. This area has been reclaimed by landfills with the soil dredged from the Kitakyushu Port, industrial wastes from a group of industries, including Nippon Steel, and construction wastes produced in the process of development of Kitakyushu City. Its total area is about 2,000 ha., including about 1,400 ha. of planned and unutilized land.

Kitakyushu City formulated the General Development Plan of the Hibikinada District from fiscal 1994 to 1995 with Yawata Works participating in the study of this plan as the party concerned. In the study of creating a new industry by utilizing this vast stretch of reclaimed land, a proposal, made jointly with Mitui & Co., of creating,

inviting, and developing environment-related industries gave one of the clues for the start of the Kitakyushu Eco-Town Project.

2.2. How Kitakyushu City encouraged environment-related industries

In the 1960's, Kitakyushu City grew into a typical heavy industry city in Japan and experienced the confrontation with serious pollution-related issues. With the advent of the 1970's, Yawata Works also invested much money in anti-pollution measures. In this process, not only Nippon Steel but also all the industrial circles in Kitakyushu City accumulated a vast amount of environment-related technologies and educated many intelligent and capable persons on pollution control. By taking advantage of available technologies and human resources, Kitakyushu City began cooperating with China and other Asian countries to offer them technologies and to accept trainees from those countries.

2.3 Kitakyushu City Environment-related Industry Committee

Nippon Steel's proposal and Kitakyushu's influence led to the establishment of an "Eco-Town System." Appointed as the Eco-Town in 1997, Kitakyushu City started the Kitakyushu City Environment-related Industry Committee, in which the head of Yawata Works is one of its members. At the 1st conference in 1997, the orientation and the background of the plan were confirmed along with the start of formulating the plan. After the work of formulating a one-year plan, a study meeting for starting respective business by private enterprises, and the activity of inviting university institutes, a concrete implementation plan was reported and approved at the 2nd conference in 1998.

The Kitakyushu Eco-Town Project is characterized by making a comprehensive and advanced proposal of "the development of basic and advanced technologies through theoretical and demonstrative researches and the training of capable personnel to carry out these tasks, and the creation of advanced environment-related business and a new social model." The concrete implementation plan consists of: 1) inviting environment-related universities and institutes to the academic research city area in Yawata-nishi Ward; and 2) structuring a demonstrative research area and a comprehensive environmental industrial complex area in the Hibikinada Eco-Town Plan Area. This plan aims at making Kitakyushu an information transmission source

in Japan oriented toward building a recycle-oriented society as well as at training people and accumulating technologies in the environment-related field in the future. Taking advantage of its location at the gateway to Asia, Kitakyushu is planning to occupy a central position in environment-related technical cooperation and business for China and Southeast Asia countries.

On the occasion of formulating and starting this plan, Nippon Steel contributed positively to the promotion of the plan by establishing Nishi-Nippon PET-Bottle Recycle Co. by investing in it and participating in other enterprising study meetings, cooperating to invite Fukuoka University by offering a site for research, and starting the work of preparing the infrastructure of the Practical Research Area.

3. Concrete Contents of the Plan

Of the Kitakyushu Eco-Town Plan, the Practical Research Area and the Comprehensive Environmental Industrial Complex Area, both of which are under preparation, will be summarized along with the activities of Nippon Steel.

3.1 Practical Research Area

The Practical Research Area is 16 ha. in planned area with 6.5 ha. (5.4 ha. for a housing site) already reclaimed as the 1st-term preparation and zoning area. Fukuoka University Institute for Resource Recycling & Environmental Pollution Control System and Kitakyushu City Eco-Town Center are already located together with 17 facilities for practical research by the industrial-governmental-academic consortium and 2 factories for “bean-curd refuse and food wastes recycling” and “waste EPS (expanded polystyrene) recycling” as the research-related business facilities.

The Kitakyushu Eco-Town Center, with a building site of about 1.2 ha., is a comprehensive service facility consisting of a center building capable of displaying, training, and simple lodging, a greenery area constituting a biotope, and an eco-town implementation area with a parking zone. There, services are offered to the researchers staying in the Practical Research Area for research, and visitors, as

many as 50,000 people per year, from the inside and outside of the city are hosted. Group visitors are to be guided to any facility they desire to visit after observing displays and being briefed at the training room.

Nippon Steel, with “a facility for demonstrating resource recovery from wastes” in the Practical Research Area, is participating in Nishi-Nippon EPS Recycle Co., Ltd. as an investor. This company is attracting public attention as a unique business establishment to recycle industrial waste EPS discharged from perishable foods markets and distribution industry to construction materials.

3.2 Comprehensive Environmental Industrial Complex and Hibiki Recycling Area

In the Comprehensive Environmental Industrial Complex Area, 25 ha. of land (20.6 ha. for a housing site) was reclaimed. Kitakyushu City obtained 6.2 ha. (5.4 ha. for a housing site) from the above site to prepare as “Hibiki Recycling Area”, and expects to sell or lease the land for joint accommodation of automobile parts dismounting companies and for medium and small recycle venture businesses. Construction is already partly underway. Six recycle companies are already located for operation in 8.4 ha. out of the 15.2 ha. for a housing site of ordinary companies. Out of remaining 6.8 ha., 5.4 ha. is expected to be used as a site for “a core facility project” described later and for expansion of existing factories. Only 1.4 ha. is left for new site. Furthermore, the development of the 2nd-term site (27 ha. expected for a housing site) is being planned on the south side of the Industrial Complex site. A construction materials recycle company already decided to locate its office and facility there.

The characteristics of this industrial complex plan lie in aiming at a maximum resource recovery ranging from material recycle to thermal recycle by accumulating recycle companies and arranging the combined core facilities for final resource and energy recovery. This project will offer one of the models of zero-emission areas by accumulating companies that recycle over a wide range from container packages to construction materials.

3.3 PET-bottle recycle business

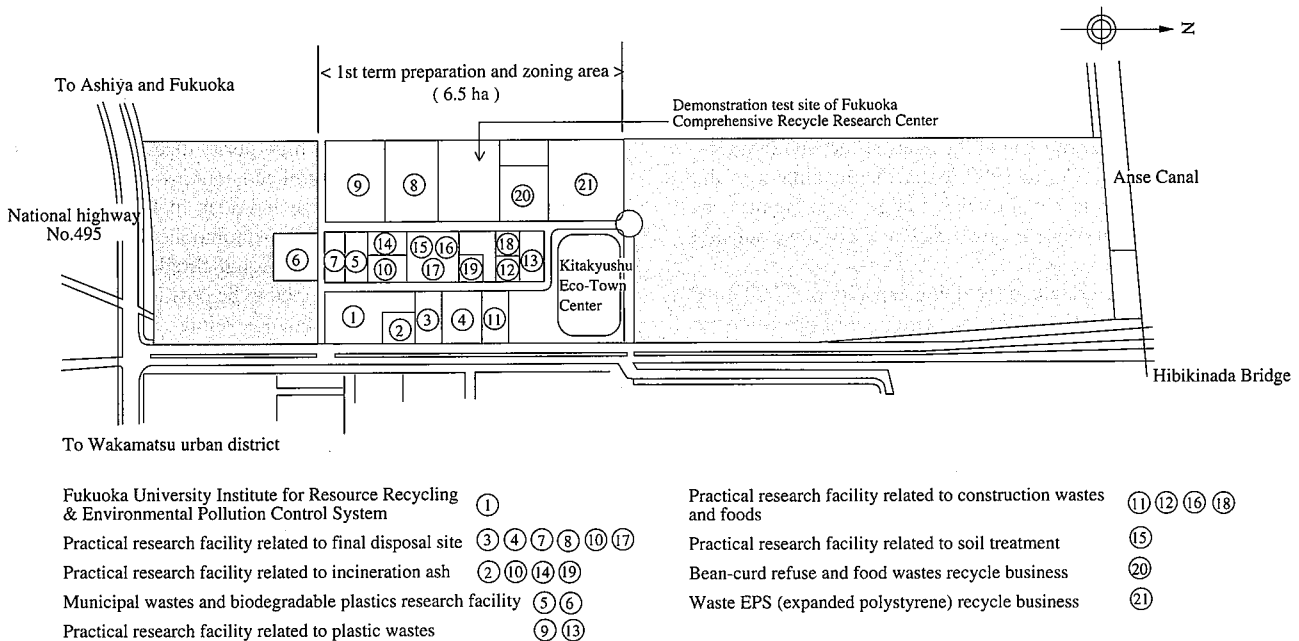


Fig. 2 Development of practical research area

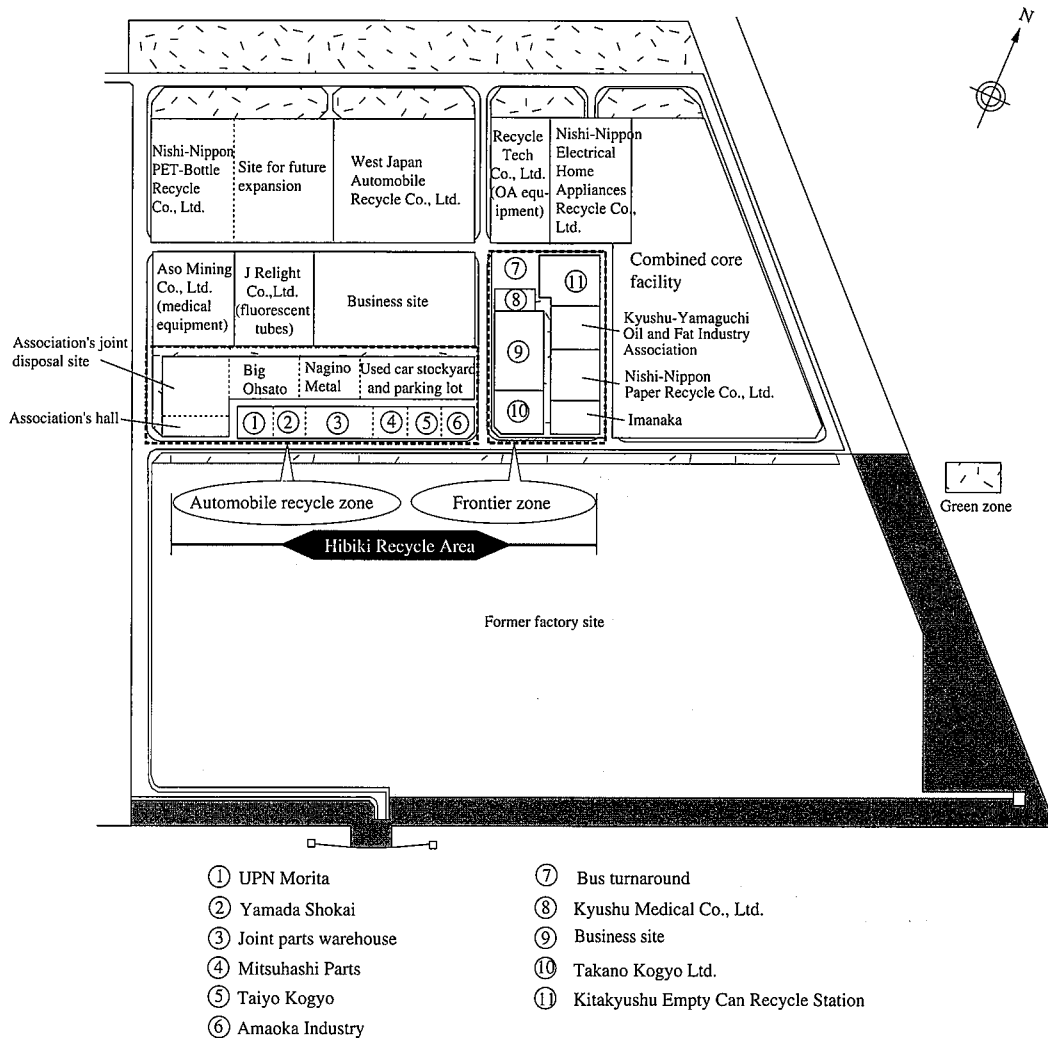


Fig. 3 Development of comprehensive environmental industrial complex

Nippon Steel established Nishi-Nippon PET-Bottle Recycle Co., Ltd. as a large shareholder ranking at the head of the shareholders' list in line with Mitsui & Co. in 1997. After the enactment of the Container Package Recycle Law in 1995, a large-scale factory was constructed as the first in western Japan with an Eco-Town subsidy given first in Japan.

The factory, constructed with a receiving capacity of 8,000 tons/year, has been in full operation since the beginning of operations in fiscal 1998 with waste PET-bottles coming in from all over the country from Hokkaido to Okinawa. Since the company has responded to customers' demands for good quality since its start, its recycled goods are enjoying a high reputation for their fine quality. With its manufacturing equipment improved and reinforced during the last 4 years up to fiscal 2001, it can receive about 20,000 tons per year as of October, 2001.

3.4 Automobile recycle business

West Japan Automobile Recycle Co., Ltd. abbreviated to WARC, was established by Yoshikawa Industry and Mitui & Co. as its main shareholders. Nippon Steel also invested in this company. An Eco-Town subsidy was given to this company in fiscal 1999.

The company is featured by 1) dismantling parts in the large

factory and increasing its sales, 2) streamlining automobile disassembling, and 3) manufacturing high-purity dice-shaped iron scraps by thorough elimination of harmful and nonferrous ingredients. This has rendered it possible to realize an epoch-making auto parts dismantling technique by which ASR (Automobile Shredder Residue), inevitably produced by the conventional shredder method, can be removed. This technique is expected to be positioned as a new recycling method among the Automobile Recycling Law now under study.

One year after the start of operation, the disassembly line is run in two shifts, and the number of automobiles disassembled is nearing 20,000 per year. All the dismantled parts in the inventory are computer-controlled with orders coming in from all over the country. Buyers of parts from foreign countries come to the factory, and the parts are exported in the unit of a container. In addition to disassembling and material recycling, the ratio of reuse in the unit of parts is estimated to increase. This means that the feature of this business is made the best use of toward the bright future.

3.5 Combined core facility plan

In the Comprehensive Environmental Industrial Complex each company there strives to recycle to the utmost. However, leftovers, such as impurities, are produced in this process. Moreover, in the

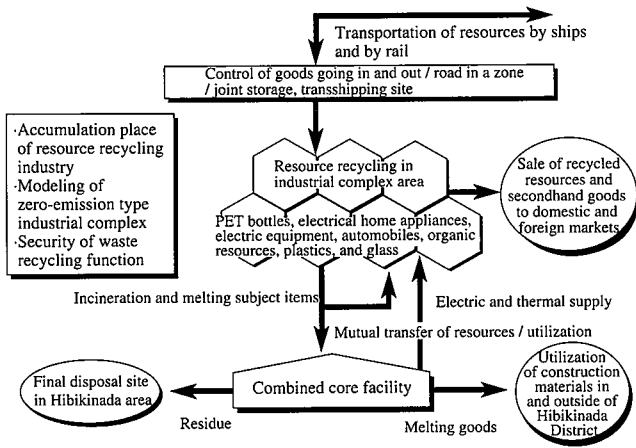


Fig. 4 Block diagram of zero-emission type industrial complex

Hibikinada District a large quantity of shredder dust, mostly ASR, is land filled. It is this “combined core facility” that realizes a model facility to recycle to the utmost those wastes and other subject items in line with material and thermal recycling. Based on Nippon Steel’s direct-melting furnace, this facility is expected to treat subject items

characterized by a high calorie and a high ratio of incombustibles so that large-capacity high-efficiency power generation and melt resource recovery can be realized. This facility is supposed to be worthy of being called “a combined one” provided with plural functions, such as a function of treating received subjects properly, a function to convert wastes to fuel (gasification), and a function to utilize wastes for power generation and thermal use, for power supply in a combined form to the industrial complex. In fiscal 2002 a new company is to be established, and a facility is to be constructed for operation in fiscal 2004.

4. Conclusion

Yawata Works, Nippon Steel has contributed to the promotion and realization of “the Kitakyushu Eco-Town Project” from the stage of planning to materializing part of the project. This project is achieving concrete results at an early stage in our country moving toward a resource recycling society with the cooperation of Kitakyushu City, participating companies, universities, and local people. Yawata Works located in Kitakyushu City hopes to cooperate and contribute continuously for the promotion of the Kitakyushu Eco-Town Project together with its affiliates by utilizing to the utmost its technologies, human resources, and infrastructure, brought up to date.