

## Experiences of Small and Medium Enterprises' Pollution Countermeasures in Japan

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### 1: Total Policies for Pollution Control Measures in Japan

#### 1-1 Period of high economic growth and outbreak of pollution problems

In the recovery period following the conclusion of World War II in 1945, the industrial structure of Japan underwent qualitative and considerable changes. With high growth characterised by the expansion of industries together with the economic adjustment phase from 1961-1965 and expansion of industries such as electrical machinery and appliances, and transport equipment from 1966, Japan's GNP exceeded that of France by 1967 and West Germany by 1969, rapidly rising to the number two position as an economic powerhouse, following the United States. However, in this process of economic growth came a great many pollution problems in various areas.

#### 1-2 Concrete policies employed for pollution countermeasures

Pollution control measures in Japan are classified as direct measures (such as regulations that are aimed directly at pollution control) and indirect measures (such as subsidies that are not directly aimed at pollution control but will contribute to its promotion). Details of how indirect measures have contributed to pollution control will not be described here, but they have played an important role.

##### (1) Establishment of environmental quality standards

The national government has established an environmental quality standard that deals with particular regional conditions (by land-use classification such as residential area, industrial area, etc.) and set its maintenance as the most important objective of the environmental measures. Also, it has permitted local government to establish original local environmental quality standards that are stricter than this general standard.

##### (2) Discharge standard for pollution, noise, etc.

As well as the environmental quality standards, industrial discharge standards for air pollution, effluent, noise, etc. have been established. These discharge standards have been set in accordance with classifications such as the area, types and scale of the subject facility, existing or newly built and so forth, but the local government is permitted to set stricter standards or additional provisions. Actually, many local governments have established rules that incorporate stricter standards.

Furthermore, many local governments have made pollution control agreements with large individual enterprises to ensure stricter pollution control measures than the legal regulation, and achieved great success.

##### (3) Creation of pollution control plans and promotion of industrial site dispersion

Based on the application by local government, the national government has specified areas where pollution is serious, and ordered the making of a plan for pollution control plan. The plan is to be revised every five years, and end when the pollution has been improved. The pollution control project that follows this plan will receive help including subsidies from the national government, and a gap has been formed between areas with and without such plan.

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In addition, policies which promoted relocation to industrial areas were adopted in order to address the various pollution problems generated by the concentration of industries and general population in the city centers, which propelled the period of high economic growth.

(4) Promotion of organization and human resources

Japan's administrative organization for pollution control, particularly for large cities, has been formed through, in the technological aspect, the accumulation of human resources in the health and sanitation areas, and in the commerce and industry areas that were formed after the modernizing era, and, in the aspect of supervision and guidance, through the acceptance of human resources from the construction administration and policy areas.

(5) Surveillance and guidance

The surveillance and guidance for enforcing pollution control measures taken by the enterprise and for complying with discharge standards have been conducted based on accumulated technologies and surveillance and guidance experiences by the administrative side.

Systems of notifying a specific facility (facilities that could cause pollution and are specified in the individual regulation), accepting complaints from residents, preparing a monitoring scheme and the obligation system to report data related to pollution control measures have been operated comprehensively.

Fundamentally, Japanese enterprises are reluctant to accept new regulations, but they are eager to observe regulations once they are introduced. In the background of such enterprises' acceptance of guidance by the administration, there is a detestation of enterprises against administrative actions, which would lead to public announcement of violation or non-cooperative acts as the administrative ability for observing was improved, because such actions would aggravate their own public estimation.

Although there are penal regulations for the violation of laws, actual cases of their application have been few. Their very existence has meaning, and enterprises have been terrified of being publicly announced as a violator.

**Measures and methodologies used in industrial pollution control actions in Japan**

Measures Used	Actual Methods
1.Prepare standards/regulations	<ul style="list-style-type: none"> <li>- Stepwise reinforcement of regulations/standards (Balance with technology development, study feasibility)</li> <li>- Entrust local government with the authority to strengthen standards/regulations</li> <li>- Set up self-imposed controls such as pollution control agreements by mutual consent among interested parties</li> </ul>
2. Introduce local plan	<ul style="list-style-type: none"> <li>- Pollution control plan (Designate priority areas and support projects)</li> <li>- Designate areas in the city planning</li> <li>- Industry location plan (Regulate and guide factory locations)</li> </ul>
3.Establish responsible bodies	<ul style="list-style-type: none"> <li>- Pollution control operator system in the enterprise</li> <li>- Training system for staff of the local government</li> <li>- Prepare manuals such as pollution control guidelines</li> <li>- Pollution control education at school</li> </ul>
4.Surveillance/guidance	<ul style="list-style-type: none"> <li>- Prepare monitoring system</li> <li>- Oblige periodical inspection, report any discharge</li> <li>- On-the-spot inspection of enterprise by local government</li> </ul>
5.Funds/technical support	<ul style="list-style-type: none"> <li>- Tax incentives for pollution control measures</li> <li>- Low interest loans and security guarantee for pollution control measures cost</li> <li>- Establish the Japan Environment Corporation (JEC: formerly the Environmental Pollution Control Service Corporation)</li> <li>- Joint works among small and medium enterprises and joint facilities for pollution control</li> </ul>
6.Damage compensation system	<ul style="list-style-type: none"> <li>- Pollution mediation committee system</li> <li>- Pollution-related health damage compensation system</li> <li>- System of entrepreneur's bearing of the cost of the public pollution control works</li> </ul>

#### (6) System of technical assistance and guidance

Japan's pollution control technologies were based on environmental hygienic technologies, particularly water supply and drainage technologies, introduced from Europe and the U.S. and, in air pollution areas, combustion technologies accumulated in the industry. However, for the measures for industrial effluent and industrial exhaust gases, the development of new technologies and introduction of countermeasures appropriate to each individual factory were necessary. Accordingly, the necessary technologies were developed and promoted under the cooperation of public and private sectors in the latter half of the 1960s.

For small and medium enterprises in particular, in which technical knowledge and human resources are lacking, the preparation and distribution of technical guidelines and manuals for pollution control technology and on-site technical guidance by technical staff of the local government have been actively conducted.

#### (7) Environmental education and public relations

By preparing special supplementary readers and so forth, environmental education has been actively pursued in primary, junior high and senior high schools. At the same time, many environmental education measures for the people have been advanced through the publication of an environmental white paper, the establishment of Environment Week, special events, etc.

## **2: National support policies for pollution countermeasures**

### **2-1 Subsidy System for the Industrial Pollution Control Project**

#### ***2-1-1 Financial Supports by Governmental Financial Institutions***

As a supporting mechanism for enterprises to deal with the industrial pollution control measures, a loan system utilizing the Fiscal Investment and Loan Program Fund (\*1) of governmental financial institutions has been established as well as legal regulations and tax incentives.

There were four reasons for adopting the above scheme:

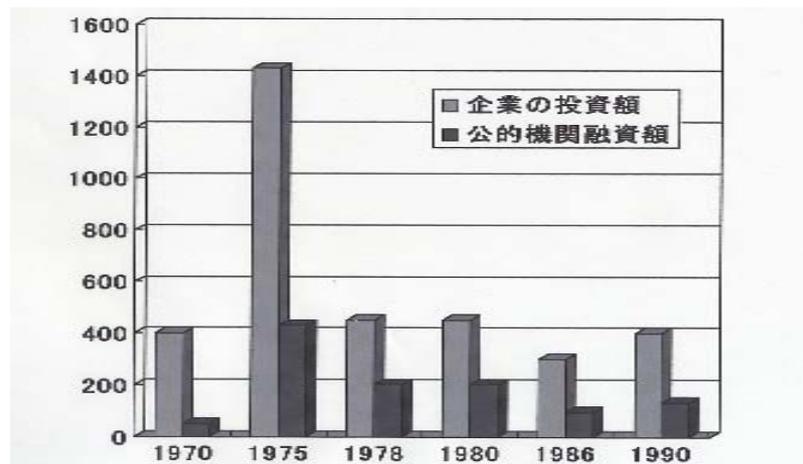
- ① Private financial institutions were unwilling to deal with the funding for pollution control measures because they thought that it was a negative investment that wasn't directly connected to production and the risk was high.
- ② Infrastructure for environmental measures could be prepared without a tax burden.
- ③ It could guide the distribution of private funds
- ④ Projects could be streamlined.

As a governmental loan system, a loan system to fund the pollution control measures was established in the Development Bank of Japan (formerly the Japan Development Bank) in 1960 to finance mainly pollution control investment by large enterprises. In 1965, the JEC was established as a support organization specializing in pollution control measures, mainly for pollution control funding support for small and medium enterprises (\*2). There was a notable change to make the national government directly involved in the project, in contrast to the previous indirect measures, which were in the form of regulation.

The role of governmental institutions such as the JEC and various projects that those institutions dealt with in the pollution control measures in Japan will be described in detail in the following, as they are considered helpful for developing countries to plan pollution control measures. Incidentally, in Korea, the Environmental Management Corporation, which was established following the JEC, has achieved great success.

The amount of pollution control investment by the enterprise peaked in the period when various legal regulations that were established in the Diet in 1970 had become effective. The share of funding by the governmental financial institutions in this fund raising by the private enterprises is as follows.

Figures are partly estimated because of insufficient data (unit: 100 million yen)



#### \*1 Fiscal Investment and Loan Program Fund

The Fiscal Investment and Loan Program Fund (FILP) is a scheme whereby the national government will generally and systematically manage the fund, gathered on the basis of the nation's credit such as deposit and insurance installments of the people through post offices or pension installment operated by the government, for the purposes of economic development and the promotion of national welfare.

This fund is an onerous fund to be managed, and separated within national accounts from the general account fund mainly based on tax revenue.

In order to invest in the project for preparing and expanding infrastructure of a highly public nature such as the construction of highways and water and sewage systems, and to finance industries requiring national support (agriculture, forestry, fishery, small and medium enterprises, etc.), the institutions manage funds by lending money at an interest rate lower than general open market rates to public service corporations that are conducting such projects.

A resolution by the Diet is required for the fund management plan, and each institution will set their interest rate with the long-term prime rate (the most favorable rate when private financial institutions finance the enterprise) as a basis and depending on the importance of the policy. As a rule, it is a long-term fund, and will be supplied to areas where private financial institutions are difficult to deal with.

#### \*2 Small and medium enterprises

Industry in Japan consists of large enterprises, which manufacture final products, and small and medium enterprises, which support the former by manufacturing parts for the product. Those small and medium enterprises that support the economic basis are clearly positioned in the policy actions and provided with various support programs. In the framework of the "Basic Law for Small and Medium Enterprise," they are classified and prescribed as follows:

- a. In the manufacturing, construction and transportation business, enterprises with capital less than 300 million yen and regular employees less than 300.
- b. In the wholesale and retail business, enterprises with capital less than 100 million yen and regular employees less than 100.
- c. In the service business, enterprises with capital less than 50 million yen and regular employees less than 100.

In the manufacturing business, such enterprises numbered more than about 6.11 million by 2002.

### 3: Roles of the Governmental Financial Institutions

The governmental finance institutions have played the role of "quantitative supplement" to make up insufficient funds from private finance institutions in the industry reconstruction period, and the role of "qualitative supplement" to finance in the long-term areas which private institutions have difficulties dealing with.

The public subsidy system for industrial pollution control measures has been playing the role of qualitative supplement, and has been quite effective in promoting the enterprise to advance pollution control measures, coupled with tax incentives, a security guarantee and an governmental interest subsidy system.

In the period when investment in industrial pollution control measures was highest, the money was raised mainly from governmental finance institutions including the Development Bank of Japan (formerly the Japan Development Bank), which is mainly intended for large enterprises, and the JEC, which is intended for small and medium enterprises, and their share of financing amounts to 20 to 30% of the total. (MITI: History of MITI Policies, 15)

At the time when enterprises started to invest in pollution control, the private finance institutions were quite negative to financing non-productive areas such as pollution control measures because of its high risk. Subsequently, it has been gradually understood that pollution control measures are indispensable to the performance of governmental finance institutions and survival of the enterprise, and also the risk of investment has lowered as the technology development has advanced. Therefore, they have gradually become active in financing pollution control, and now 70 to 80% of the total investment in Japan, required for the pollution control measures to date, is estimated to come from private finance institutions.

Actually, the total amount of loans supplied by the JEC, which has applied a large amount of its fund to pollution control measures in small and medium enterprises, was about two trillion yen from its establishment to the end of FY1999, and amounts to a little less than 10% of the total pollution control investment in Japan, which is said to be 20 to 25 trillion yen.

To sum up the above, the roles of governmental finance institutions are: In the first place, they have stimulated the private sector to finance pollution control measures.

Secondly, they have been carefully financing small and medium enterprises, which have difficulties in securing pollution control funds but which make up more than 90% of the enterprises in Japan and more than 50% of the pollutant discharge, and consequently have promoted their advance with pollution control measures and contributed to their modernization and rationalization.

#### **4: Industrial orientation policies (industrial site regulations and guidance)**

##### **4-1 Policies for regional dispersement of industries**

The national government actively promoted policies for the displacement of large-scale factories, as countermeasures for pollution generated by the concentration of industries in the city centers, which promoted high economic growth, as follows:

- ① Creation of comprehensive national development plan
- ② Establishment of regional and area plans in urban planning regulations, regulation of land use in residential, commercial and industrial areas
- ③ Policies for the legal regulation of industrial areas in large cities
- ④ Policies for the legal regulation of large-scale industrial expansion located in large cities
- ⑤ Policies for the legal promotion of relocation to large-scale industrial areas and taxation and financial support policies
- ⑥ Policies to support the relocation and concentration of industries in order to control pollution by small- and medium-sized enterprises located in large cities

##### **4-2 Policies to support the relocation and concentration of industries in order to control pollution from small- and medium-sized enterprises**

The industrial structure of Japan is designed with large businesses producing final products, and small- and medium-sized businesses producing necessary parts and providing support. Small- and medium-sized businesses comprise 99% or more of all enterprises, with the number of businesses in the manufacturing industry exceeding 6,110,000 in 2002 and employing approximately 60% of all workers. These small- and medium-sized businesses that support the foundations of the economy are clearly placed in policy aspects, with various support policies.

With the establishment of the Small and Medium Enterprise Agency in 1948, the Small and Medium Enterprise Basic Law was enacted in 1963 to address the productivity and wage differences between large-scale and small and medium-sized businesses.

#### ***4-2-1 Advanced funding for small- and medium-sized enterprises***

In order to promote appropriate policies for enterprise scale with the modernization of equipment of small- and medium-sized businesses and cooperative projects, national and prefectural cooperative financial systems were established. To date, a large number of small- and medium-sized enterprises have made use of these funds to address the issues of industrial relocation and advancement of business. National projects are implemented by the Japan Small and Medium Enterprise Corporation, which is governed by the Small and Medium Enterprise Agency.

##### **(1) Outline of the system**

- Utilizing this fund, the business that is made to relocate its factory establishes a joint union on the basis of the law regarding organizational restructuring of small- and medium-sized businesses.
- The union develops the plans for the project with the support of the prefecture of the particular area, and makes an application to the prefecture for the fund
- The prefecture verifies the contents of the plan and makes an application for the national financial grant to the Japan Small and Medium Enterprise Corporation.

##### **(2) Implementation of project**

- After financial support from the Japan Small and Medium Enterprise Corporation is decided, the union develops the project implementation plan and makes an application to the prefecture for financial support
- With the joint financing of the prefecture and the Japan Small and Medium Sized Enterprise Corporation, the financial support received via the prefecture is broken down as follows: 65% allotted for general business expenses, 2.7% yearly interest, and repayment period of 20 years. The remaining funds are provided in-house or obtained from other joint-financial ventures.
- The union carries out the creation of the necessary site for relocation and construction of factories.

#### ***4-2-2 Japan Environment Corporation project***

Many of the enterprises which are located in urban areas have been in operation since the period of high economic growth and have contributed to pollution problems such as noise pollution, in and around residential and commercial areas. In addition, complaints against these factories made to the city administration have become an important issue in addressing the myriad environmental problems. Because of this, in addition to the existing laws, the Japan Environmental Corporation governed by the Ministry of the Environment carried out the implementation of the relocation of industries.

### **5: Set-up of Japan Environment Corporation (JEC)**

#### **5-1 Foundation of JEC (\*3)**

##### ***5-1-1 Roles and Functions of JEC***

JEC was established as an organization wholly owned by the Government to conduct business necessary for preventing industrial pollution caused by air pollution, water pollution and so forth in areas where factories and other business establishments are concentrated on a massive scale.

It raises funds from the Government's Investment and Financing Program, government subsidies programs and other grant programs to implement the (a) Construction and Transfer Program and (b) Loan Program.

In 1965, when JEC was established, Japan had just managed to scrape through a period of serious industrial pollution crises thanks to various measures taken nationwide by public and private initiatives. Its success could be attributed to the appropriateness of the combination of various sets of "regulatory measures" and "promotional measures" introduced by the Government. JEC, as an organization specializing in "promotional measures," assumed the following roles.

Firstly, JEC actively took the initiative in preventive measures for industrial pollution, thereby taking the lead in various measures, which was then followed by private industries. The "Construction and Transfer Program" method collectively moved factories and other business establishments of small and medium sized enterprises (SME's), which were located as sources of pollution in urban residential and commercial areas, to proper industrial areas and promoted the introduction of pollution control facilities in addition to rationalization and improvement of their management and production regimes.

This method is very useful for SME's, which cannot respond to various emission controls on their own due to lack of human and technological resources, to implement pollution control measures timely. At the time of JEC's foundation, pollution control was a new problem accompanied by the development of technology for enterprises. Projects furnished with advanced technology and methodology introduced by JEC were regarded as harbingers of measures to be taken subsequently by enterprises themselves.

Secondly, JEC played the role of pioneering fund provider for the introduction of preventive measures against industrial pollution. Funds provided by JEC are estimated to amount to 10% of the total investment for the same purposes by private enterprises.

Since at the time of JEC's foundation, private financial institutions were unwilling to provide loans for pollution control facilities which did not directly contribute to productivity improvement, JEC's loans were at the vanguard of the financing activities in this field.

Taking advantage of expertise obtained in the daily business diagnosis and implementation of the Program for prospective borrowers, JEC had recommended suitable pollution control technology to be adopted and its scale. Later, private financial institutions extended their loans in this field based on precedent models and results established by JEC. Shares of public loans given by JEC and DBJ (the former Japan Development Bank (JDB)) up to now in the total amount of loans extended to private enterprises for pollution control facilities are higher than those for other production facilities. JEC has provided funds mainly to SME's, while DBJ has done so mainly to big businesses and key industries. Incidentally, DBJ has provided more money than JEC in absolute terms.

\*3 JEC

JEC is a public service corporation founded in 1965 by a special law and operating under the auspices of the Ministry of the Environment, etc. with a capital fund of 5 billion yen. Its main office located in Tokyo. Employees number about 200.
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**5-1-2 Mechanism of Fund Raising**

As mentioned above, JEC's Construction and Transfer Program and Loan Program are operated with funds raised from the Government's Investment and Financing Program.

JEC's operations for SME's are partly subsidized by the Government's General Accounting Budget, i.e. the Government grants a part of the interest to be paid by JEC when JEC repays its borrowings to the Government's Investment and Financing Program (\*4).

As the interest rate on loans (cost of money) raised from the Government's Investment and Financing Program is thus cut, JEC can extend its loans to SME's at a rate which is lower than its fund cost. In other words, SME's can obtain loans or facilities from JEC at a long-term fixed interest rate below the level at which JEC raises its funds from the Government.

As general administrative expenses of JEC's Administration and Loan Departments are granted from the Government's General Accounting Budget, such expenses are not passed on the rate of interest to be borne by its customers. In contrast, expenses incurred on the Construction and Transfer Department are added to the cost of the facilities to be delivered to its customers. The construction cost of these facilities is reimbursed by customers in installments after JEC has paid it to contractors with funds from the Government.

In such a way, JEC could make long-term funds available to its customers for pollution control facilities at a fixed interest rate below the level offered by private financial institutions. It is also worth noting that interest rates charged by JEC will be adjusted in accordance with the change of those of loans to public service corporations from the Government depending upon the current economic situation.

As JEC's operations are thus closely linked to fiscal policies, its annual operations plans and budget must be submitted to and reviewed and approved by the Ministry of the Environment in advance. The expenses budget, which depends on grants or borrowing from the Government must be submitted through the Ministry of the Environment to and examined by the Ministry of Finance in the preceding fiscal year. JEC's operations are thus controlled by competent Government authorities including the Ministry of the Environment.

Subsidies provided to JEC by the Government are restricted to operations for SME's. JEC's annual operation budget is heretofore in the range of 70 to 120 billion yen. The accumulated total of annual operation budgets amounts to 2 trillion yen up to FY 2000. The accumulated total of subsidies received from the Ministry of the Environment amounts to about 55 billion in the same period.

## **5-2 Construction and Transfer Program**

Under the Construction and Transfer Program, JEC has constructed joint pollution control facilities and concentrated pollution-causing factories, buffer green belt, industrial waste disposal complexes, etc. on behalf of industrial cooperative associations, local municipalities, etc. which would install and use such facilities, and transferred them to such users on a long-term installment basis at a low interest rate. Two types of operations from among the activities which seem to be particularly useful for pollution control measures to be adopted in SME's of future China will be summarized below.

### **5-2-1 Joint Pollution Control Facilities**

Measures to establish joint pollution control facilities collectively are often successfully adopted by SME's in Japan as part of their pollution control policies. It is very meaningful to transfer this method overseas.

#### **(1) Procedures of Operation**

- An industrial cooperative association shall be established by four or more SME's, which have pollution problems. (Such enterprises will be selected from among those controlled by the municipal authorities in charge of the environment.)
- JEC will procure the site and construct the necessary facilities in accordance with an agreement to be concluded with the cooperative association and transfer them to the cooperative association. (The ownership of the facilities is transferred to the cooperative association and a mortgage will be created thereof on behalf of JEC.)
- The cooperative association shall pay 5% of the total investment amount to JEC upon commencement of the operation. The remaining amount corresponding to 95% is raised by JEC from the Fiscal Investment and Loan Program Fund.
- The assessment rate of collateral will be 80%. The remaining 20% shall be covered separately by the cooperative association. (Generally, a letter of guarantee will be prepared by its main financing bank.)
- The balance of 95% of the total investment amount shall be solidly repaid in installments over 20 years after delivery by members of the cooperative association.
- The interest rate to be imposed on the cooperative association is about 1% lower than that of funds procured from the Fiscal Investment and Loan Program Fund. The difference will be borne by JEC with funds appropriated from the General Accounting Budget by the Ministry of the Environment.
- If one or more member enterprises of the cooperative association should become insolvent before full repayment of the obligation, other members shall pay the balance on behalf of the failed member. In practice, the problem is resolved by adding to the cooperative association other enterprises which also have similar problems.

For the operation, the administrative authorities in charge of the environment will give recommendations and advice to the parties concerned on planning, design, construction and financing of the facilities.

At the time of JEC's foundation, when industrial pollution was one of the gravest social problems, the construction of joint pollution control facilities was a typical JEC operation. These projects responded successfully to great social expectations. Among them, there were some pioneering projects which would be introduced for the first time in Japan and designated as the model of subsequent projects of a similar kind (\*5).

#### **(2) Advantages and Disadvantages**

Generally, but particularly in the case of chemical plants, economies of scale, i.e. cost reduction per unit in this case, are attained proportionately to their dimension. Projects of this type aim mainly at such economies of scale. Smoke, wastewater, hazardous gases and other waste, which are discharged from industrial activities, will often be treated efficiently from the perspective of space, equipment and operation if they are processed collectively in joint pollution control facilities established by member plants, when compared with those of individual treatment. Joint facilities have technical and economic advantages in terms of operation management.

Some advantages of joint treatment facilities, e.g. in the case of processing industrial effluent, are enumerated as follows:

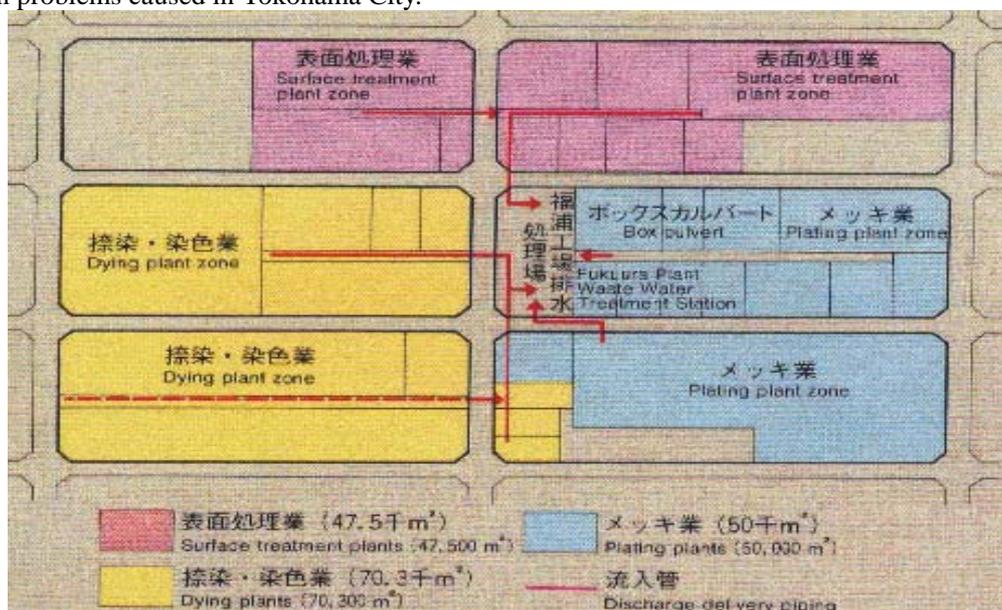
- ① Improvement of effluent characteristics by interaction of its chemical components (neutralization of acid and alkaline wastewater; neutralization of oxidizing and reducing wastewater; supplementary activity of wastewater containing nutrition such as phosphor and nitrogen in sludge processing; agglomeration in the agglomerating and precipitating process of wastewater containing iron salts; dilution of thick waste liquid by thin).
- ② Reduction of construction cost of facilities by virtue of economies of scale.
- ③ Reduction of operating cost, including wages, energy, chemicals by virtue of cooperative work.
- ④ Other rationalization effects derived from cooperative work.

Later, some local ordinances in Japan prescribed stricter standards of effluents proportionately to their volume to be discharged. Joint large-sized pollution control facilities were thus more strictly controlled than individual small-sized facilities and they had to install more sophisticated equipment to respond to these new rules. In addition, innovative technology made it possible for small-scaled facilities to process wastewater more efficiently. For large-scaled facilities some disadvantages have occurred, including:

- ① Reduction of construction costs, i.e. the major advantage of large-scaled facilities, was not so simply achieved as expected.
- ② If a user member should discharge an extraordinary quantity or quality of wastewater, all the production lines of other members would also be forced to stop their operation.
- ③ Efforts of individual members to reduce the load on joint facilities would be neglected unless management standards and/or the tariff structure of wastewater were not featured with the utmost care, and in such a case, joint facilities would not necessarily lead to the reduction of operating costs.
- ④ Factories of individual members and joint facilities might not be operated in a synchronized manner; the current capacity of joint facilities might not suffice the new need of individual members, especially in the case of a change of quantity and/or quality of wastewater due to the addition of products or processing alterations. In fact, joint facilities have rarely been constructed since the 1980's because of such reasons.

Production facilities were often replaced, taking it as an opportunity for factory relocation. Quality and quantity of wastewater were thus difficult to estimate. At the commencement of the Program, some fatal errors were committed due to a lack of accumulated data.

\*5 Joint Effluent Treatment Facilities at Fukuura, Yokohama, a case of joint facilities built in the newly established Kanazawa Industrial Park for SME's, which were collectively relocated to resolve effluent pollution problems caused in Yokohama City.





#### Outline of Facilities

Equipment cost and processing cost of effluent: to be borne by individual enterprises

* Area of site:	approx. 11,000 m <sup>2</sup>
* Volume of wastewaters to be processed:	
Highly concentrated cyanamide wastewater	3 m <sup>3</sup> per day
Lowly concentrated cyanamide wastewater	130 m <sup>3</sup> per day
Chrome salt wastewater	75 m <sup>3</sup> per day
Acid and alkaline wastewater	1,245 m <sup>3</sup> per day
Printing and dyeing wastewater	4,000 m <sup>3</sup> per day
* Total construction cost:	3,670 million yen

#### **5-2-2 Collective Relocation of Pollution-Causing Factories**

Zone restrictions were first introduced in 1970 in Japan. Urban land use still continues to be chaotic. This is the so-called “Problems of mixing residences and factories” and a longstanding challenge to urban planning in Japan (\*6).

The pollution problem caused by SME’s and mostly complained about by neighboring people is factory noise ancillary to residences. It is often resolved by way of a collective relocation of factories. JEC has heretofore implemented about 400 projects (i.e. the relocation of 4,000 factories) to resolve vibration, odor, malodor, water pollution and air pollution caused by SME’s).

\*6

There are no statistics on “Problems of mixing residences and factories,” but it is clear that most SME’s have been burdened explicitly or implicitly with this problem. According to a census by Yokohama City, the factories of 1,500 enterprises were close to residences and noise has been a problem with neighboring citizens. They were operating very inefficiently, as in the agreement with neighbors on the limitation on operating time. Yokohama City systematically constructed reclaimed land in the city area to relocate about 300 SME factories, which have had serious problems with the local population.

#### (1) Procedures of Operation

- An industrial cooperative association shall be established by four or more SME’s, which have problems with pollution. (Such enterprises will be selected from among those controlled by municipal authorities

in charge of the environment.)

- JEC will procure a lot and construct the necessary facilities in accordance with an agreement to be concluded with the cooperative association and transfer them to the cooperative association. (The ownership of facilities is transferred to the cooperative association and a mortgage will be created thereon on behalf of JEC.)
- The cooperative association shall pay 5% of the total investment amount to JEC upon commencement of the operation. The remaining amount corresponding to 95% is raised by JEC from the Fiscal Investment and Loan Program Fund.
- The balance of 95% of the total investment amount shall be solidly repaid in installments over 20 years after delivery by members of the cooperative association.
- The assessment rate of collateral will be 80%. The remaining 20% shall be covered separately by the cooperative association. (Generally, a letter of guarantee will be prepared by its main financing bank.)
- The interest rate to be imposed on the cooperative association is about 1% lower than that of funds procured from the Fiscal Investment and Loan Program Fund. The difference will be borne by JEC with funds appropriated from the General Accounting Budget given by the Ministry of the Environment.
- For the operation, the administrative authorities in charge of the environment will give recommendations and advice to the parties concerned on planning, design, construction and financing of the facilities.
- If one or more member enterprises of the cooperative association should become insolvent before full repayment of the obligation, other members shall pay the balance on behalf of the failed member. In practice, the problem is resolved by adding to the cooperative association new members which have similar problems.

## (2) Examples of Projects

Integration of SME factories to “factory buildings” newly built in the area where they are located.



Integration of SME factories to “industrial parks” newly established in the area where they are located.

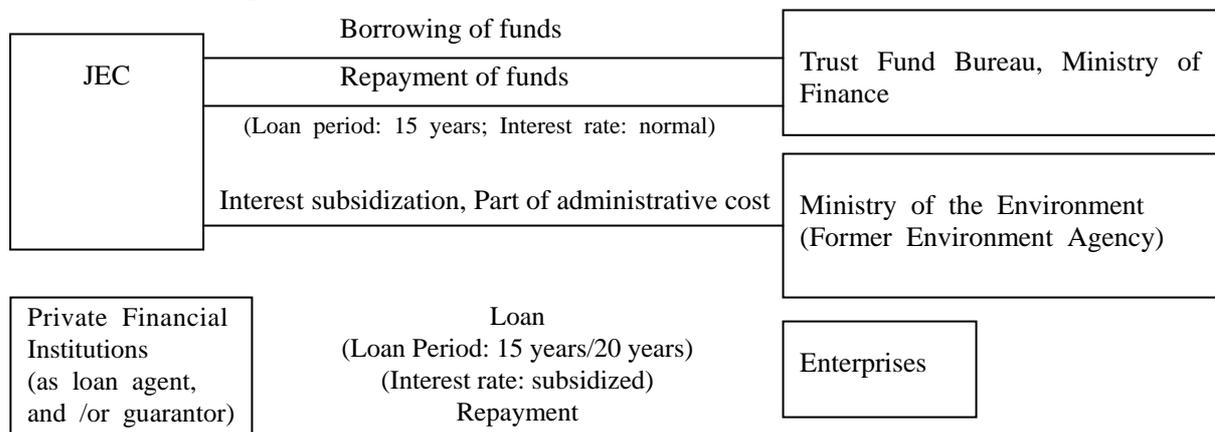


Kobe inner park factory complex

### 5-3 Loan Program

#### (1) Procedures of Operation

- JEC is engaged in the lending to SME’s, industrial cooperative associations, local governments, etc. of funds required for the setting up of pollution control facilities (joint or individual pollution control facilities, industrial waste management facilities, integrated septic tanks) or the taking of measures against pollution soils and underground water.
- JEC’s Loan Program is classified into two categories: (a) Loans through Agent which are extended to the end customers through about 5,000 offices of financial institutions (various banks); and (b) Direct Loans which are extended to local governments, public service corporations established by local governments or a part of large enterprises. Lending terms and conditions including JEC’s financing share and interest rate depend upon the scale of borrowers and types of projects.
- Loans to pollution control facilities or environment conservation facilities imply a supplementary or secondary financing for customers as such loans are directed to the peripheral facilities of factories.
- A lot of land may be procured with proceeds of such loans as a part of pollution control facilities. As a source of equipment funds JEC often assumes the role of a main financing bank for borrowers.
- In this case, JEC’s financing share in the total amount of funds raised is so big that JEC has a mighty voice in the credit risk management after disbursement. JEC functions as a financial institution and at the same time, as a supervisor who gives guidance and recommendation on environmental improvement to enterprises and waste disposers. JEC will not only review the loan application from the viewpoint of a financier, but will also prepare an environmental impact assessment.
- JEC has to operate its Programs with sophisticated expertise and know-how of finance, environment and business management (\*7).



## (2) Procedures of Operation

### a. Loans through Agents

- Upon a bank's request, JEC concludes an agent agreement with the said bank
- A prospective borrower applies to the agent bank for a loan.  
(At the time of JEC's establishment, the applicant would submit a recommendation letter prepared by the environment authorities of the municipality where they were located stating that the applicant required the setting-up of pollution control facilities. This Program was thus conducted in close partnership with the administration.)
- The agent bank investigates the management and operation of the applicant in general and confirms that the loan will be repaid.
- The agent bank refers the loan applicant to JEC if it is convinced of the applicant's creditworthiness.
- JEC further reviews the applicant's management, scrutinizes the technical feasibility and gives advice if necessary. Having confirmed the soundness of the project, JEC concludes a loan agreement with the applicant through the agent bank and disburses funds.
- If the borrower has difficulty in repaying the loan, the agent bank shall repay 20% of the outstanding balance to JEC on behalf of the borrower and JEC bears the remaining 80%.
- The ratio of non-performing loans is less than 1% of the total.
- JEC pays an agent fee for the agent banks to make up costs incurred to them.

### b. Direct Loans

- Local governments, public interest corporations established by local governments and a part of large enterprises are allowed to apply for direct loans to JEC.
- JEC investigates the applicant's management, scrutinizes the technical feasibility and gives advice if necessary. Having confirmed the soundness of the project, JEC concludes a loan agreement with the applicant and disburses funds.
- The borrower reimburses the loan in accordance with provisions of the loan agreement with JEC.
- If the borrower has difficulty in repaying the loan, JEC ultimately suffers the loss of the outstanding balance. Heretofore JEC has no non-performing debts in respect of direct loans.

\*7

For the Loan Program, JEC organizes the Loan Division (about 8 persons) in charge of loan documentation to be exchanged with borrowers and agent banks and the Credit Assessment Division in charge of management investigation (5 persons, part of whom are loaned from private financial institutions) and technical investigation (about 3 persons). The staff in charge of the technical investigation majored in chemistry, chemical engineering, environment engineering, etc. at university. They are trained for one month at banks and 2 months at JEC in advance of practice, respectively.

## (3) Terms and Conditions of Loans

Appropriate collateral and/or guarantor are required as is usual in commercial loans from private financial institutions. Facilities constructed with the loans from JEC are also eligible for collateral. This is a very favorable condition for borrowers as compared with the terms and conditions of commercial loans.

## (4) Eligible facilities

### ① Pollution control facilities

- Effluent treatment facilities (equipment for coagulation sedimentation, activated sludge, dissolved air floatation, neutralization, concentration, etc.)
- Smoke and soot treatment facilities (dust catcher, exhaust gas desulphurizer, absorption tower, Nox removal equipment, tall chimney, etc.)
- Other facilities (deodorizer, deduster, sound absorber, vibration damper, CFC collector/regenerator, etc.)

### ② Treatment facilities of general waste from business activities

- Final disposal facilities (controlled, inert type), waste treatment facilities
- Intermediate treatment facilities (facilities for incineration, dehydration, crushing, drying, solidification, etc.)
- Recycle facilities (equipment for compost, reusing, regeneration of wastes, etc.)
- Waste vehicles and carriers

## **6. Tax Incentives (National and Local Taxes)**

### **6-1 Tax measures**

In order to promote industrial pollution control measures, the following incentives have been incorporated into national and local tax laws.

#### **6.1.1 Tax Incentives since FY 1972**

In the national tax laws, a tax holiday on fixed assets tax was introduced in respect of smoke and soot treatment equipment and wastewater treatment equipment, and special methods were allowed in the calculation of depreciation; and in the local tax laws, a tax holiday on fixed assets tax was introduced in respect of smoke and soot treatment equipment and wastewater treatment equipment, and special methods were allowed in the calculation of depreciation.

#### **6.1.2 Tax Incentives since FY 1998**

##### **(1) Incentives in National Tax Laws**

The following incentives have been introduced since FY 1998 on those facilities and equipments designated in the national tax laws.

###### **① Income tax**

From the viewpoint of environment conservation, special measures are taken for capital gain at the time of replacement of the following designated business properties: noise emitting facilities, facilities specified in the Water Pollution Control Law, facilities specified or designated in the Law Concerning Special Measures for Conservation of Lake Water Quality (Lake Law) and smoke and soot emitting facilities.

###### **② Corporate tax**

From the viewpoint of environment conservation, special measures are taken for capital gain at the time of replacement of the following designated business properties: noise emitting facilities, facilities specified or designated in the Water Pollution Control Law, facilities designated in the Lake Law and smoke and soot emitting facilities.

###### **③ Income Tax and Corporate Tax in common**

From the viewpoint of environment conservation, special measures and special tax credit are allowed in income tax and corporate tax.

##### **(2) Local Taxes**

As for pollution control measures by local tax laws, the following incentives are allowed in fixed assets tax, special landholding tax, business office tax, automobile tax, light automobile tax and automobile acquisition tax.

###### **① Fixed Assets Tax**

From the viewpoint of environment conservation, following facilities are exempted from fixed assets tax:

- Factories installing facilities specified in the Water Pollution Control Law, wastewater treatment facilities which are located in the business establishments.
- NO<sub>x</sub> controlling facilities.
- Smoke and soot treatment facilities (buildings and structures, machinery, equipment).
- Designated dust (asbestos) treatment facilities.
- Garbage treatment facilities, final disposal site of general waste and industrial waste treatment facilities, etc.

###### **② Business Facility Tax**

From the viewpoint of environment conservation, following facilities are exempted from business facility tax:

- Factories installing facilities specified in the Water Pollution Control Law, wastewater treatment facilities which are located in the business establishments, facilities designated in the Lake Law and wastewater treatment facilities located at water sources designated in the Law Concerning - Special Measures for Water Quality Conservation at Water Resources Area in Order to Prevent the Specified Difficulties in Water Utilization.
- Facilities for conversion to industrial water.
- General waste treatment facilities and industrial waste treatment facilities

③ Automobile Tax

Tax reducing measures are allowed on low-emission automobiles from the viewpoint of their promotion: • Electric vehicles, methanol vehicles, hybrid vehicles and natural gas vehicles.

- Replacement by vehicles which meet the newest pollution control regulation.

④ Light Automobile Tax

Tax reducing measures are allowed on light electric automobiles from the viewpoint of their promotion.

⑤ Automobile Acquisition Tax

Tax reducing measures are allowed on low-emission automobiles from the viewpoint of their promotion.

- Electric vehicles, methanol vehicles, hybrid vehicles and natural gas vehicles.
- Replacement by vehicles which meet the newest pollution control regulations.
- Vehicles which meet the newest exhaust gas pollution regulations.

These incentives in fiscal policy cover not only the end-of-pipe pollution control facilities of individual enterprise, but also a wide range of land, factories and buildings, low-emission production facilities and low-emission vehicles. They contribute to imbedding pollution control investment costs into the total costs of respective enterprises and are appreciated as effective methods in the sense that they have promoted pollution control investment by enterprises.