

Chapter 5

Promoting Recycling Industries as a Part of Industrial Policy in Japan

Michikazu Kojima

Institute of Developing Economies, JETRO

March 2009

This chapter should be cited as

Kojima, M. (2009), 'Promoting Recycling Industries as a Part of Industrial Policy in Japan', in Kojima, M. and E. Damanhuri (eds.), *3R Policies for Southeast and East Asia*. ERIA Research Project Report 2008-6-1, p.87-97. Jakarta: ERIA.

Chapter 5. Promoting Recycling Industries as a Part of Industrial Policy in Japan

Michikazu KOJIMA

Institute of Developing Economies, JETRO

Introduction

In most countries in Asia, recycling policy is not regarded as a part of industrial policy. Ministries in charge of industry are likely to be not interested in the recycling industry. But in Japan, the Ministry of International Trade and Industry (MITI), now, Ministry of Economy, Trade and Industry (METI) initiated some policies in the field of promoting recycling in early 1970s. This paper reviews some industrial policies for promoting recycling by MITI and METI. In Section 1, the background of starting recycling industrial policy is explained. One of the first steps undertaken by MITI was the implementation of policy on the establishment of industrial associations specializing in recycling. In section 2, the activities of these organizations are also summarized, such as making guidelines for classification of used paper and supports to industrial waste information exchange programs. In Section 3, supports for technological developments are reviewed. Japanese government has supported experimental, pilot and demonstration project of recycling technologies since 1970s. In Section 4, Eco-town Project which is a kind of recycling industrial park is reviewed. Section 5 deals with recent activities on recycling particularly the Japanese Industrial Standard (JIS) for recycled product. Section 6 overviews how the ministry develop such policies, based on dialogue with industries.

I. Background of Recycling Industrial Policy

In 1950s and 1960s, Japan suffered from air pollution and water pollution. At that time, industrial waste was indiscriminately disposed of into river or air, or incinerated without pollution control. It was around 1970s that pollution control regulation was tightened and enforcement was strengthened. The Air Pollution Control Law and the Water Pollution Control Law were enacted in 1968 and in 1970, respectively. From the installment of wastewater and emission treatment facility, industrial wastes such as sludge and dust were generated. Although, the official statistics did not exist, but it was seen that industrial waste were likely to increase rapidly, thus the air and waste pollution control was strengthened.

In 1970, the government enacted the Waste Disposal and Public Cleansing Law. Although the Ministry of Welfare was in charge of waste management in general, the law required MITI to guide the management of industrial waste and control the recycling of waste materials.

In addition to legal obligation, the concept of “Difficult Waste” (Tekisei Shori Kon-nanbutsu) was a pressure to industries and MITI to start the activities on recycling. Along with the process of economic development, new waste such as plastic waste, electronic appliances and automobile were generated. In conventional waste treatment facility including incinerator these wastes could not be treated properly. Local

governments were considering to put the responsibility of waste disposal on manufacturers of these products. For example, the local government and the Ministry of Welfare were against on the plan of manufacturers to use plastic bottle for milk. In February 1974, an advisory committee for Tokyo metropolitan government made a report on “difficult waste.” These movement forced MITI and industries to do something about recycling.

The Industrial Structure Council, an advisory committee, also proposed in May 1971 the development of “closed system” which did not emit any hazardous substances into the environment. Particularly, the development of the social closed system for solid waste was emphasized. It also mentioned that putting responsibility on manufacturer would not solve the problem.

MITI made a committee for considering policy on utilizing waste in 1973. Interim report was compiled in 1974, which emphasized the importance of recycling to save resources (MITI, 1974). The report reviewed the current situation and future direction of waste paper, end-of-life vehicle, plastics, waste oil, waste tire, waste steel can, waste aluminum can, waste home appliances and so forth. It identified the technologies to be developed, and the roles of stakeholders. The arguments on roles of stakeholders were a reaction on how to address the growing volume of “difficult waste.” The Industrial Structure Council made the sub-committee of utilizing waste, which made a report on recycling policy in 1977.

II. Industrial Association for Recycling

II-1. *Establishing Industrial Association for Recycling*

In 1970s and 1980s , several major associations or organizations specializing on recycling, such as the Paper Recycling Promotion Center and the Clean Japan Center (CJC) were established with support from MITI. Table 1 shows the major industrial associations for recycling established in this period.

Table 1. Selected Industrial Association for Recycling in Japan

Name of Association	Year of Establishment	Examples of Activities
Plastic Waste Management Institute	1971	R & D on plastic recycling, study on recycling in foreign countries, data collection for LCA (Life Cycle Analysis)
Steel Can Recycling Association	1973	Promoting recycling of steel can, data collection for LCA, campaign against

		scattering garbage
Aluminum Can Recycling Association	1973	Pilot collection program in 1974, creating recycling mark of aluminum can, data collection on recycling of aluminum can
Paper Recycling Promotion Center	1974	Guarantees for member company, activities to improve quality of used paper, data collection
Association of Electronic Home Appliances (original name: Center for Promotion of Recycling Home appliances)	1974	Technological development of recycling home appliances, designated organization for Home Appliance Recycling Law since 2000.
Iron and Steel Recycling Institute (original name: Japan Iron and Steel Scrap Industry Association)	1975	Industry data collection and management, negotiation on behalf of industry, improving business practices in the industry
Clean Japan Center	1975	Supporting industrial information exchange program in 1980s, study on recycling technology, information dissemination on 3R
Nippon Slag Association	1978	Research on quality and technologies for iron and steel slag product, investigate and collect information on production, supply and demand of iron and steel slag products

II-2. Classification for Collecting Recyclable Waste

There are many kinds of recyclable wastes. If a waste is mixed with other wastes, the recycler should sort out the waste from other waste. So recycling costs becomes higher. To utilize the recyclable wastes effectively, Japan developed a classification of recyclable wastes and criteria for receiving recyclable wastes.

Classification of recyclable wastes depends on the technology of recycling. It is obvious that paper, plastics and steel cannot be recycled in a one system. But people may not be aware of types of recyclables. To make smooth transactions of recyclable wastes, standard classification was resorted to by the Japanese government and association of recyclers.

To cite an example, the papers are classified into several categories. Recycling process of each category of paper is slightly different from others. The value of waste papers is also different. It is not clear which one is the oldest classification of recyclable waste paper in Japan. The Ministry of Commerce and Industry made the “Classification of Waste Paper” in 1939, which classified waste paper into 27 categories. Current

classification was done in 1971 by the Paper Recycling Promotion Center, consisting of 9 categories and 29 sub-categories. The nine categories are “hard white shavings; cards,” “white woody shavings; white manila,” “fine printed paper,” “woody printed paper,” “old newsprint,” “old magazines,” “craft browns,” “old corrugated containers,” and “others.”

The criteria for receiving recyclable wastes are also important. If contraindications are mixed with recyclables and put into recycling process, the recycled material may not be sellable. Recycling factory also loses money, if it buys non-recyclable wastes at price of recyclable wastes. If each of the users has its own criteria, the collector faces difficulty to handle recyclable waste. On the other hand, collectors can earn more money when they mix non-valuable waste with valuable recyclable waste and sell it at value of recyclable waste. This situation made it necessary to determine the criteria that set the minimum standards of contraindications and allowable level of other paper wastes.

To make these kinds of the criteria, the Paper Recycling Promotion Center conducted a survey in 1979 to the paper mills and consolidators. The survey showed that 33.3% of paper mills have written criteria for receiving used paper and 59.1% have the criteria but not in written form. Findings showed that the instability in transactions resulted due to unclear criteria, as well as due to the different criteria set by each of the paper mills. Consequently, both paper mills and consolidators recognized the importance of having common criteria. They considered that the criteria would ensure stable supply of qualified used paper to paper mills and that the criteria could reduce the claims of paper mills from the consolidators. The survey identified the problems in the quality of used paper, such as water content, allowable level of mixed other type of paper, and contraindications. The results of the 1979 survey were scrutinized by committees consisting of representatives from paper mills, consolidators, the government’s Ministry of International Trade and Industry, as well as from the Clean Japan Center--a foundation specializing waste management and recycling, and from the Paper Recycling Promotion Center.

The criteria had been revised several times because new types of papers and new technologies of treatment have been introduced. The revisions were also undertaken by a committee consisting of stakeholders. The latest contraindications for used paper are listed in Box 1 and Box . The range of the contraindications and specifications continue to be extended.

Similar classifications, standards, or guidelines for sorting of recyclable waste have been developed, such as in the case of glass cullet of bottles. To make this kind of criteria, it is noted that stakeholders participated and accorded in the formulation process. In Japan’s experience, the survey was used as starting point for stakeholders to reach a common understanding of current conditions and problems (refer to Box 1, Box 2, and Table 2).

Box 1 Contraindications for Waste Paper Listed in Criteria in 1979

Carbon, resin processed paper, oiled paper, waxed paper, aluminum foil, plastic processed paper, non-woven fabric, cellophane, synthetic paper, expanded polystyrene, pitch, plastic bag and others.

Source: Paper Recycling Promotion Center (1979).

Box 2 List of Contraindications for Waste Paper in 2005

List A: materials which is not related to raw materials for paper which may cause big problem

- 1) Stone, glass, metals, sand, and wood tips, etc.
- 2) Plastics
- 3) Resin-impregnated paper, parchment paper, textile
- 4) Tarpaulin paper, waxed paper, construction materials such as gypsum board
- 5) Textile printing paper, thermal foaming coated paper, synthetic paper, non-woven fabric
- 6) Paper touched with infectious waste in medical facilities and others
- 7) Other materials which may cause damages to process or products

List B: Materials which is not good for mixed with raw materials for paper

- 1) Carbon
- 2) Carbonless paper
- 3) Vephyl or polyethelen coated or laminated paper
- 4) Adhesive tape (but adhesive tape attached on the carton box is excluded.
- 5) Thermal paper, perfumed paper
- 6) Other materials not suitable for paper production

Source: Paper Recycling Promotion Center (2006).

Table 2. Criteria for Standard Quality of Waste Paper

	Contraindications		Other Papers	Moisture
	List A	List B		
Newspaper	Not acceptable	Less than 0.3%	Less than 1% *	Less than 12%
Carton	Not acceptable	Less than 0.3%	Less than 3%	Less than 12%
Magazine	Not acceptable	Less than 0.5%	Less than 5%	Less than 12%
Miscellaneous Paper	Not acceptable	Less than 0.5%		Less than 12%
Office paper	Not acceptable	Less than 0.5%		Less than 12%

Source: compile from Paper Recycling Promotion Center (2006)

* excluding inserted leaflet.

II-3. Waste Information Exchange Program

Industrial waste information exchange program has been conducted by some local government sine 1970s. CJC helps the development of such programs in some prefecture. In addition, CJC organizes the joint industrial waste information exchange

program, which covers more than two prefectures. This program is reviewed in Chapter 10 in this report.

II-4. Financial Support

Since 1960s, government has provided low interest loan for pollution control investment, through some semi-governmental organization. In 1970s, some recycling industries such as lead acid recycling industries made investment in pollution control equipment (Kojima and Jain, 2008). Japanese government still maintains low interest loan for investment for environmental protection, including investment in waste treatment and recycling.

Industrial associations also play a role in such kind of investment. Industrial association was an information dissemination channel to companies on such programs. In addition, Paper Recycling Promotion Center also has program to give guarantee of borrowers, when a member of the association borrows the money from bank.

Central and local governments have provided some tax incentive for investment in specific recycling facilities. For example, in early 1970s, accelerated depreciation was applied to industrial waste treatment plants including plants recycling plastic industrial waste. From FY 2008 to 2010, the tax base for property tax is reduced to three fourth in the first three years after investment.

III. Support Technological Development

Agency of Industrial Science and Technology had research project on the Technology for Resource Recycling System from 1973 to 1982. The project was called “Star Dust 80”. The project covered several recycling technologies such as crushing, and physical and chemical segregation of plastics, home appliances and mixed metals. The pilot plant was built and operated in Yokohama around 1980. It was a combination of segregation, composting, pulping, and plastic waste petro-chemical processes. Although the plant was operated, the quality of pulp and composting was not sufficient enough. So the system was not fully utilized. But some technology developed in the project became a basis of further development of recycling technology such as recovery of substances by gasification.

CJC also developed several pilot plants for developing recycling technology. In FY 1975, the center established and operated recycling plants for home appliances, tyre and oil sludge. The pilot recycling plant for home appliances was developed in Chiba prefecture with Center for Promotion of Recycling Home Appliances. Tyre recycling

plants were developed in Osaka and Hyogo prefecture with Japan Automobile Tyre Manufacturers Association, Mechanical Social Systems Foundation and others.

NEDO (New Energy and Industrial Technology Development Organization) also supports technological development in recycling industries. For example, demonstration plant making “eco-cement”, which utilized ash from incinerator of household waste and sludge from sewage treatment in cement production, was supported by NEDO from 1994 to 1998. CJC organized technical committee to manage experiments. The demonstration plant was established in Aichi prefecture. After the demonstration project, commercial plant was developed in Chiba, with support of Eco-town project, which will be explained in the following section.

IV. Eco-town Project: Recycling Industrial Park

Japan’s Eco-town project started in 1997. In the Eco-town project, local governments with private companies promote recycling and waste minimization using the industrial infrastructure of the region. Ministry of Environment and METI have supported the activities, especially the development of advanced recycling facility.

In introducing the eco-town project in a certain region, the local government prepared a proposal of eco-town. This proposal was scrutinized by both ministries, with the view that this was to be served as model to other regions. So far 26 eco-towns have been approved. The types of eco-town vary depending on the situation in the areas. For example, in Kitakyushu eco-town, recycling factories are built and operated in an eco-industrial park. Basically, the factories are newly developed. Collaboration with research institution located in the region is also stressed. In Kawasaki, another eco-town, linkages of steel, chemicals and other relatively big industry are enhanced. Additional new facilities have also been constructed.

If a recycling factory is not located in the region for a certain type of waste, or if the capacity of recycling factories is not enough to utilize a certain type of waste, establishing a co-industrial park is one of the policy options.

V. JIS for Recycling

Japanese Industrial Standard (JIS) specifies standard of industrial activities including standard for products and testing method in Japan. The legal foundation of JIS is the Industrial Standardization Law. JIS covers tens of recycled products and testing methods, to promote consumption of recycled product. Table 3 shows examples of standards that have been formulated.

The process to formulate the standard is as follows. Industrial association or others can submit the draft of JIS to Japan Industrial Standards Committee. Based on

consultation with experts and stakeholders, Japan Industrial Standards Committee establishes the standard and publicizes it.

Table 3. Recycled Products in Japan Industrial Standards

Code	Year Established	Latest Amendment or Confirmation	
A5011-1:2003	1997		Slag aggregate for concrete – Part 1: Blast furnace slag aggregate
A5011-2:2003	1997		Slag aggregate for concrete – Part 2 :Ferronickel Slag aggregate
A5011-3:2003	1997		Slag aggregate for concrete – Part 3 :Copper slag aggregate
A5011-4:2003			Slag aggregate for concrete – Part 4: Electric arc furnace oxidizing slag aggregate
A5015:1992	1979	2003	Iron and steel slag for road construction
A5021:2005			Recycled aggregate for concrete-class H
A5022:2007			Recycled concrete using recycled aggregate class M
A5023:2006			Recycled concrete using recycled aggregate class L
A5031:2006			Melt-solidified slag aggregate for concrete derived from municipal solid waste and sewage sludge
A5032:2006			Melt-solidified slag material for road construction derived from municipal solid waste and sewage sludge
A5731:2002			Recycled plastics inspection chambers and covers for rainwater
A5741:2006			Wood-plastic recycled composite
A5905:2003	1957	1994	Fiberboards
A5908:2003	1957	1994	Particleboards
A6201:1999	1958	2004	Fly ash for use in concrete
A6206:1997	1995	2002	Ground granulated blast-furnace slag for concrete
G3111:2005	1956	1987	Rerolled carbon steel
G3117:1987	1969	2004	Rerolled steel bars for concrete reinforcement
K6313:1999	1951	2003	Reclaimed rubbers
K6316:1998		2003	Vulcanized particulate rubber
K6329:1997	1954	2002	Retreaded tires
K6370:1999	1955	2003	Compounded stock for retread and repair
K6450:1999		2003	Rubber block and rubber pavement – test methods
K6930:1994		2006	Reclaimed granular molding materials of agricultural polyvinyl chloride film
K6931:1991	1979	2001	Reclaimed plastics bars, rods, plates and piles
K6932:2007	1981	2006	Recycled plastics stakes
K7390:2003			Testing methods for reclaimed poly(ethylene terephthalate)(PET) moulding materials from PET bottle
K9797:2006			Unplasticized poly (Vinyl chloride) (PVC-U) three layer pipes with recycled solid core
K9798:2006			Unplasticized poly (Vinyl chloride) (PVC-U) three layer pipes with recycled foamed core
L3204:2000	1985	2005	Recovered fiber felts
R5214:2003	2002		Ecocement
P4501:1993	1962	1998	Toilet tissue papers
Z1506:2003	1951	1997	Corrugated shipping containers

Source: Compiled from Japan Standard Association (2007).

To speed up the establishment of Sound Material-cycle Society, JIS Committee made Action Program for Environmental JIS in 2001, which also covers standards related to recycling. Some items specified in the Action Program were requested by the local government, which wanted to use recycled products. The lack of a clear standard to ensure the quality of recycled products was an obstacle for using these products. .

An expert pointed out that some of the JIS for recycled products are lacking in the specified testing method for environmental safety. There might be a room to improve the standards in Japan. But in general, creation of standards for recycled goods improves the reliability of recycled products.

VI. Dialogue with Industries and Other Stakeholders.

In Japan, if ministries are planning to make new regulation or amend the existing one, they organize council meetings, which recommend the direction of policies. The Ministry of Environment has a Central Environment Council that conducts dialogues with stakeholders on environmental policies. MITI (METI) has also organized Industrial Structure Council to have formal dialogue with industries and other stakeholders, on industrial policy including those for recycling industries.

One of the reports by the Industrial Structure Council, “What should be Direction of International Trade and Industrial Policy in 1970s?”, which was published in 1971, mentioned the necessity of technological development of system of recycling solid waste. In 1975, Industrial Structure Council formulated Sub-committee for recycling waste. The sub-committee made a report in 1977, which pointed out the weakness of recycling non-valuable waste, insufficient technological development on recycling and environmental problem from recycling business. To solve these problems, the reports recommended establishment of comprehensive recycling policy. It also emphasized that policy measures should be developed, taken into account the marketability of waste.

Table 4. Categories and Obligation in Law for the Promotion of Utilization of Recyclable Resources

	Explanation	Industry/Products
Designated resource-saving industries	Business entities are required to reduce generation of by-products	Pulp and paper; inorganic chemical manufacturing; iron-making and steel-making/rolling; primary comer smelting and refining; automobile manufacturing
Designated resource-recycling industries	Business entities are encouraged to use recyclable resources and parts	Paper manufacturing; glass container manufacturing; rigid PVC pipes and pipe fitting manufacturing; copier manufacturing
Specified reuse-promoted products	Required to ensure rational use of raw material; prolong	Automobiles; home appliances; PC; Pachinko machines (a type of game

		product life and reduce generation of other used products	machine); metal furniture; gas and oil appliances
Specified reuse promoted products		Manufacturers are required to promote the use of recyclable resources and recovered products	Auto mobiles; home appliances; PC; pachinko machines; copier; metal furniture; gas and oil appliances; bathroom units and kitchen systems; devices using compact rechargeable batteries
Specified products	labeled	Manufacturers are required to label these products to facilitate sorted collection	Steel cans and aluminum cans; PET bottles; compact rechargeable batteries; PVC construction materials; paper/plastic container and packages
Specified resource-recycled products		Manufacturers are required to Promote self-collection and recycling	PC; compact rechargeable batteries
Specified by-products		Business entities are required to promote the use of these by-products as recyclable resources	Coal ash generated by the electricity industry; soil and sand; a lab of concrete-asphalt and lumber generated by construction industry

Source: Compiled from various information.

After some efforts in 1980s, the Industrial Structure Council made the first Guideline for Waste Treatment and Recycling. The guideline has been revised for several years. The latest one is the ninth Guideline published in 2006. The nine guideline targets 35 items and 18 industries, which covers 70% of municipal solid waste and 40% of industrial waste.

The Law for the Promotion of Utilization of Recyclable Resources enacted in 1991 was supporting the dialogue on recycling policy between industries and MITI. The law was modified in 2000, and became the Law for the Promotion of effective Utilization of Resources. Based on this law, the MITI specified the responsibilities of manufactures or business entities in several categories, as presented in Table 4.

Although the punishment for non-compliance companies is not strong, the law defines responsibilities of implementing 3Rs on manufacturers.

Conclusion

Industrial policy for recycling has been a driving force to change Japanese economy to be more sustainable. In some Southeast Asian countries, integration of recycling policy into industrial policy is still weak. This paper hopes that the experiences in Japan as presented in this paper, can provide useful information on how to formulate similar policies in the region.

References

- Kojima, Michikazu and Amit Jain, 2008. "Controlling pollution and small-scale recycling industries: Experiences in India and Japan," in Michikazu Kojima, ed. *Promoting 3Rs in Developing Countries: Lessons from the Japanese Experience*. pp. 36-58. Japan: Institute of Developing Economies- JETRO.
- Sangyo Kozo Shingikai, 1971. *Sangyo Kozo Shingikai Chukan Toshin – 70 Nendai no Tsusho Sangyo Seisaku no Kihon Houkou ha ikani arubekika* (Industrial Structure Council, *the Mid-term Recommendation of Industrial Structure Council – What should be the Basic Direction of Industrial Policy in 1970s*. (in Japanese). Place of Publication: Publisher.
- Ministry of International Trade and Industry (MITI), 1991. *Tsusho Sangyo Seisaku Shi* (History of Ministry of International Trade and Industry) (in Japanese). Place of Publication: Publisher.
- Paper Recycling Promotion Center, 1979. *Koshi no hyoujun kikaku ni kansuru chousa kenkyu houkokusho*, Clean Japan Center.
- Paper Recycling Promotion Center, 2006. *Koshi no hyoujun kikaku* (Criteria for Standard Quality of Waste Paper), revised version on November 29, 2006 (in Japanese), downloaded from <http://www.prpc.or.jp/> on March 15, 2009.
- Takamatsu, Hideaki, 1980. "Star-dust'80 keikaku no genjo," (Status of star-dust'80 plan) *Kankyo Kenkyu*, 28: 64-72 (in Japanese).