SECTION 1
THE SITUATION PRIOR TO THE REFORM OF WASTE POLICY IN JAPAN-FROM THE END OF WORLD WAR II TO THE EARLY 1990S

Making a new start following World War II, Japan realized economic development as its citizens desired more affluent lives. Amid this process, priority was placed on corporate profits and personal convenience, and there was no consensus nationally on the importance of investment in the appropriate treatment of waste, such as the reduction of waste generated, recycling, and final disposal.

As a result, various types of environmental pollution emerged one after another caused by illegal dumping and other forms of improper treatment of waste. Consequently, waste-related public concern and distrust increased.

This section examines Japan's approaches to realize proper waste treatment taken from the end of World War II to the early 1990s.

1. Postwar framework for waste disposal

Immediately after the end of World War II, the issue of waste was seen as a public sanitation issue that would resolve problems resulting from sanitation-related waste. However, as waste became more problematic both in quality and quantity during the period of Japan's high economic growth, the public came to see it as part of a broad range of environmental problems connected with responses to environmental pollution. Thus, enactment of the Waste Management and Public Cleansing Law (often called the "Waste Management Law") paved the way for the establishment of a waste disposal framework that addressed, among other points, clarification of the responsibilities and standards for dealing with waste, including industrial wastes.

1.1. From the end of the war to the period of high economic growth

1.1.1. The waste problem as a "public sanitation problem"

In Japan-a country that rebuilt its economy from scratch after World War II-due to the inflow of people into urban areas from peripheral areas, the treatment of general waste (garbage) and human waste has become problematic, particularly in urban centers.

The Public Cleansing Law was enacted in 1954, with a stated purpose of "improving public health by sanitarily disposing of waste and cleaning the living environment." This law aimed to establish frameworks for dealing with waste in municipalities, which are the major entity involved in such work. The existing systems at the time referred to garbage and human waste as "unsanitary substances," and they were intended to enable the disposal of such waste from a public health-based standpoint in order to maintain a sanitary and comfortable living environment.

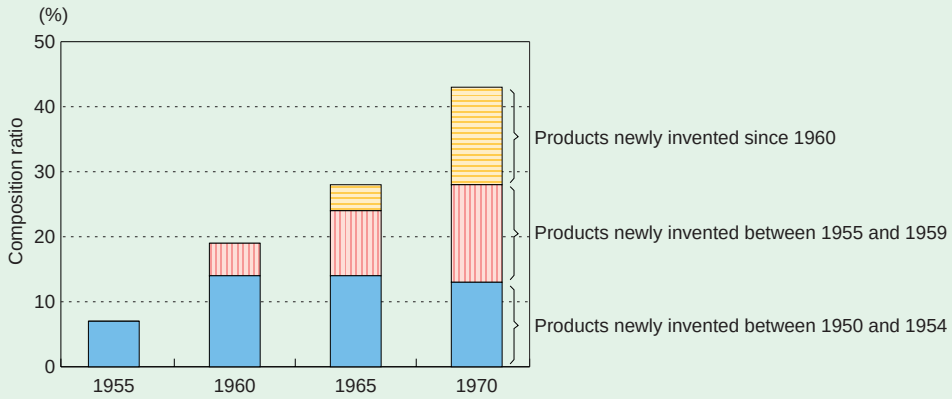
1.1.2. Changes in the waste problem during the period of rapid economic growth

From the mid-1950s to the end of the 1970s, Japan's economy shifted from a period of reconstruction to a period of high economic growth. This transition led to major changes in Japanese lifestyles.

Such changes also had a major impact on the issue of waste. Higher incomes led to consumers' demand for a more convenient lifestyle, which promoted electrification of homes, typified by the products called the "Three Holy Durables": televisions, refrigerators, and electric washing machines. In particular, the popularization of television was a factor in the nationwide expansion of urban lifestyles, which was characterized by living in apartment blocks. Advertisements on television also became a factor behind large-scale consumption by increasing the public's desire to purchase goods.

A large number of newly-invented products came into the market during this period. The appearance of many products (represented by the "Three Holy Durables") contributed to the realization of a materially-affluent society. However, under large-scale production and consumption processes, the continuous appearance of new products and models soon made existing products obsolete, which resulted in increases in waste generation.

Breakdown of ratio of the value of newly invented products in manufacturing sector

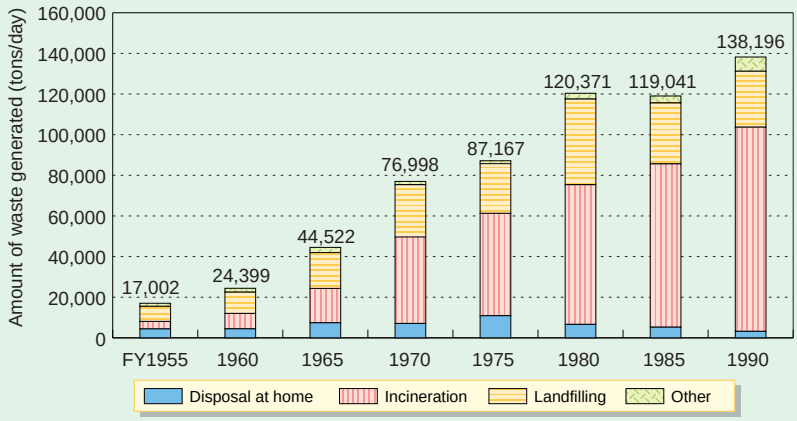


Source: *Economic Survey of Japan* FY1971

Moving into the 1960s-a time during which the aforementioned lifestyle changes progressed even further-the amount of waste generated increased considerably, particularly in urban areas experiencing population influx. With regard to how such waste was handled, nearly 40% was disposed of in unlined landfill or dumped in mountainous areas, rather than in soil-covered landfill. The burying of untreated waste in Japan, with its climate of high temperatures and humidity, attracts vast numbers of flies and mosquitoes. This situation led to neighborhood and residents' associations acting to exterminate such insects. At the same time, the necessity of securing landfill sites became an urgent issue for Japan, a country with limited national land.

Given this situation, the "Emergency Measures Law for the Development of Living Environment Facilities" was promulgated in 1963. Based on this law, the government formulated the "First Five-Year Plan for Development of Living Environment Facilities," which laid out a policy by which, in general, waste would be incinerated in urban areas, with the residue being disposed of in landfills.

Changes in disposal methods of general waste



Note: Figures for 1970 and earlier are total waste amount in special cleansing districts based on the Public Cleansing Law. Figures for 1975 exclude waste haulage brought in directly upon moving house, etc.
Compiled based on: "*Annual Report on Health and Welfare*" and the "*Quality of the Environment in the Japan*"

Incineration of wastes to prevent the major infestation of flies at Yume-no-shima in 1965
Source: "*Tō kyō-to Seisōgyō Hyakunenshi*" (100-year History of Sanitation Work in Tokyo)

However, the amount of waste generated increased at a pace far exceeding the forecasts by the municipal cleaning sector, with the amount of general waste generated per person per day increasing roughly 6% per year during the late 1960s. Furthermore, during this time, the amount of waste that is difficult to dispose of, such as bulky trash and plastic waste, also increased. In particular, the production of plastics grew by as much as 25% per year during the late 1960s. Moreover, the number of local governments that were approaching their plastic mix-rate limit in terms of the capacity of treatment facilities (10%) increased during this time. Facing these situations regarding waste, the cleaning sector in municipalities had to made difficult decisions concerning their waste policy.

1.2. From the end of the period of high economic growth to the period of "bubble economy"

1.2.1. Forming the framework of the Waste Management Law

The problem of waste generated in households was not the only issue that arose from Japan's high economic growth. Another issue was the problem of industrial waste generated through the production activities of businesses entities.

Industrial waste had traditionally been accumulated within the grounds of factories or handled through the efforts of individual companies. However, with the progress of urbanization and a shortage of final disposal sites (landfills), the number of cases in which waste was improperly treated increased. Moreover, it is estimated that the amount of industrial waste generated in 1967 was approximately 1.2 million tons per day. This was 24 times more than the amount of waste generated by households (50,000 tons). Much of this industrial waste was incombustible or required special processing to prevent environmental pollution. Consequently, it exceeded the capacity of municipal disposal systems.

This led to the abolition of the Public Cleansing Law and establishment of the Waste Management Law in the so-called [anti-] "Pollution Diet" in 1970. This move marked the first step toward the establishment of today's waste management system. The new law differed significantly from the Public Cleansing Law in that it stated "conservation of the living environment" (which included responses to pollution problems as well as disposal of waste as a sanitation issue) as one of its purposes and that it clarified the waste management responsibilities of businesses.

The Waste Management Law, which defines waste by classifying it as "municipal waste" or "industrial waste," was the first law that established a legal definition of industrial waste. Moreover, like other pollution regulations, it placed responsibility for the treatment of waste generated through business activities on the businesses, based on the Polluter Pays Principle. Furthermore, the law stated that when a business manufactures, processes, or sells a product and the product (or its packaging, etc.) becomes waste, the manufacturer must ensure appropriate and easy disposal of that product, packaging, etc. In this way, it established the responsibilities of businesses that manufacture, process, sell, or engage in other activities related to products, packaging, etc.

In addition, the framework for waste management was also changed significantly. The responsibility for the disposal of municipal waste remained with municipalities, but the entire area of each municipality became the geographical basis for its waste management. For the newly-created category of industrial waste, disposal by businesses became the fundamental rule.

1.2.2. Establishment of disposal standards for hazardous waste

At the time, disposal of hazardous industrial waste was the most urgent problem. Consequently, at the time of the Waste Management Law's enforcement in 1971, in order to make every effort to protect public health, strict standards were established for the final disposal of contaminated remaining materials that contain mercury, cadmium, and other hazardous substances.

The government order for the enforcement of the law was revised in 1973. This revision led to the establishment of criteria for industrial waste to be handled as hazardous substances among industrial discharges of contaminated materials, etc., to be disposed of in landfills or released into the ocean.

1.2.3. Increasing seriousness of waste as a social problem

In this way, establishment of the Waste Management Law clearly defined industrial waste and clarified the management responsibilities and criteria for all types of waste. However, illegal dumping of industrial waste, which accounted for a large portion of waste generated, became a major problem.

Furthermore, it was not always the case that every municipality could secure sufficient capacity to dispose of waste, even municipal waste. As pollution problems occurred and public awareness of environmental pollution rose, the idea that waste should be managed within the area where it was generated gained ground. This sometimes led to clashes between local governments without enough final disposal sites and local governments that wished to avoid the inflow of waste from outside.

Blocking the hauling of waste into Koto Ward
Source: "*Tō kyō-to Seisōgyō Hyakunenshi*" (100-year History of Sanitation Work in Tokyo)

As waste management issues became more and more prominent as a social problem, it became necessary to develop policy measures immediately.

After the formulation of the Waste Management Law, a variety of standards and laws was established to ensure proper waste disposal. In 1976, the Waste Management Law was revised, particularly in the areas of certain fulfillment of responsibility by waste-generating businesses and disposal companies and reinforcement of regulations in order to ensure appropriate final disposal[2]. Furthermore, in 1976, methods for final disposal were classified into three types (isolated-type, inert-type, and controlled-type) in accordance with the particular substance's characteristics[3]. An additional step was the issuance of an "Cabinet

2 Specifically, regulations for the issuance of orders demanding action were created, standards for consignment of disposal work were established, and disposal records of businesses responsible for disposal were stored as part of a system based on the responsibility of waste-generating businesses, etc. Furthermore, notification procedures were established and preliminary studies were implemented based on technical standards in order to ensure proper final disposal.

3 Final disposal sites of industrial waste are classified into three types: "isolated-type" sites for landfill disposal of hazardous industrial waste; "inert-type" sites for landfill disposal of industrial waste of a stable nature (waste plastic, waste rubber, metal scrap, etc.) that entails little risk of disruption for conservation of the living environment; and "controlled-type" sites for landfill disposal of other industrial wastes in order to prevent disruption for conservation of the living environment. Furthermore, it was established that fundamentally, final disposal sites for municipal waste would be controlled-type sites.

order establishing technical standards on final disposal sites for municipal waste and final disposal sites for industrial waste," which set structural and maintenance standards in accordance with each type of site.

Together with the establishment of these legal systems, efforts to prepare a foundation of proper treatment progressed. This was achieved mainly through national subsidies for the building of treatment facilities of municipal waste and low-interest financing and special tax measures for the building of treatment facilities for industrial waste.

1.3. The period of the "bubble economy"

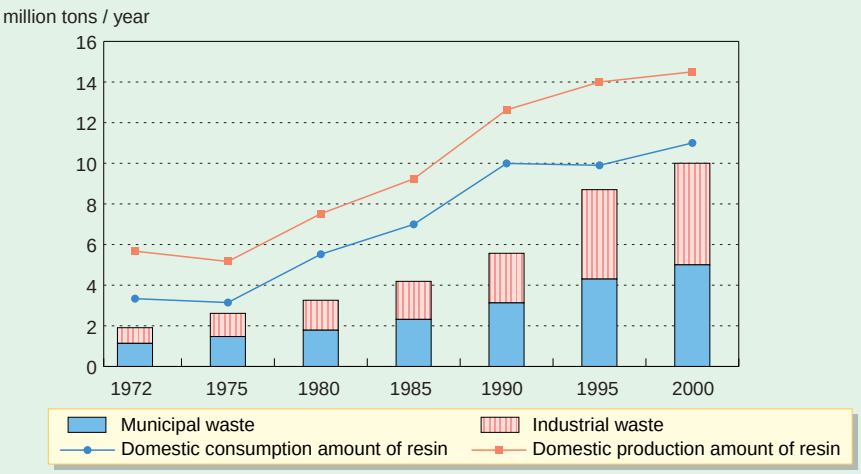
Gaining momentum after the Plaza Accord of 1985, the so-called "bubble economy" (1985 to the early 1990s) occurred, leading to an increase in waste generation.

1.3.1. Expansion of the waste problem in terms of both quality and quantity as a result of the bubble economy

At this time, the types of waste generated began to vary, reflecting broadening and diversifying consumer activities, progressing technical innovation, and other factors. Thus, the amount of waste for which it is difficult to give proper disposal — such as dry-cell batteries, large televisions, refrigerators and other household appliances — increased in terms of both quality and quantity.

At the same time, lifestyles changed drastically. The generation that had been employed during the affluent period of Japan's high economic growth began showing a tendency to demand diverse rather than uniform lifestyles. This accelerated the development of such products that were manufactured in small volume but in great varieties as well as frequent delivery-based distribution, which led to greater use of plastic containers and wrapping materials for the products. The expansion of convenience stores which first appeared in the 1970's and rapidly increased based on store networks and 24-hour operation can be described as one example of this kind of small volume and frequent distribution. This was also the time that use of synthetic resin bottles ("PET bottles") started to be popularized.

Changes in production volumes and waste volumes of plastics in Japan



Source: Compiled by the Ministry of the Environment from Plastic Waste Management Institute documents

Office paper is included among the waste collected by municipalities. Thus, with the development of office automation technology, the amount of used copy paper, computer paper, and other forms of wastepaper generated by offices also increased.

Similarly, regarding industrial waste, increased residential and office building demand in urban areas led to a boom for civil engineering and construction projects, which brought with it higher outputs of waste of construction materials.

The bubble economy continued until around 1991, when economic growth started to decline. Yet even since that time, the amount of waste generated has been relatively constant.

1.3.2. The emergence of social problems caused by hazardous substances which accompany waste management

In 1983, a major social problem came to light through a study by the Tokyo Metropolitan Research Institute for Environmental Protection on the risks of environmental pollution caused by mercury through the processes of incinerating or disposing discarded dry-cell batteries that contain mercury (mercury, alkali, manganese, etc.). At the same time, newspapers reported that dioxins had been detected in the incinerated ash of waste incinerators in urban areas. How to cope with the problem of the generation of dioxin at waste incineration facilities became a major issue.

Because it is difficult to secure final disposal sites in Japan, policy measures to reduce the amount of waste generated through incineration, compression, and crushing as forms of intermediate processing have been promoted.

However, even if waste volume is reduced through incineration, appropriate final disposal sites for the dumping of incinerated ash are required. The rapid increase in waste volume during the bubble economy led to the shortage of final disposal sites. At the same time, it became even more difficult to build new sites because of skyrocketing land prices and opposition from residents. In particular, major urban areas with excessive concentrations of population and industry faced an even more difficult situation, as they had to deal with both rapidly growing waste volume and difficulty in securing disposal sites.

Furthermore, when individual municipalities have difficulty in securing final disposal sites within their administrative area, they have no choice but to take their waste to final disposal sites in other municipalities. This results in large-scale movement of the waste. Industrial waste that is treated under the responsibility of businesses sees even greater large-scale movement than municipal waste, and there were many cases where such industrial waste was dumped illegally in forests, wilderness areas, etc.

2. Cases of improper disposal of waste

Economic activity in Japan has continued even after the period of high economic growth, bringing about a society with high material affluence. In addition, social changes have led to the large-scale consumption and normalization of disposable products in daily life. Growth in the volume of waste and the diversification of waste substances reflecting these changes made the appropriate disposal of waste very challenging. Thus, it became the case that officials-who faced waste well in excess of forecasts-took an approach of "well, in any event we need to get this off the streets" and had little choice but to deal with this problem in an after-the-fact and stopgap manner.

2.1. The problem of improper waste disposal, as typified by illegal dumping

Improper waste disposal, including illegal dumping, causes water contamination, soil pollution, and other forms of environmental pollution, as well as unnecessary financial burdens for the rehabilitation to its original state of soil that has been subjected to dumping.

Typical examples of inappropriate disposal

Example of intentional inappropriate disposal	Example of unintentional improper storage
- Illegal dumping on Teshima Island, Kagawa Prefecture From 1983 to 1990, an industrial waste disposal company on Teshima Island, Kagawa Prefecture, labeled a large quantity of remnant materials, waste oil, sludge and other forms of industrial waste labeled as "having value" and brought it to a disposal site on the island managed by the company. This waste (approximately 560,000m^3) was illegally disposed of through repeated controlled burns and landfilling. The waste contained not only heavy metals such as lead, chromium, and cadmium but also hazardous substances including PCBs and dioxins. Although the company's actions were discovered in 1990, measures to dispose of the waste and to prevent leakage of contaminated groundwater remains underway in Kagawa Prefecture. It is expected that the cost of disposal will reach some 45 billion yen.	**- Improper storage in Iwaki, Fukushima Prefecture** From 1985 to around 1998, an industrial waste disposal business in Iwaki, Fukushima Prefecture, illegally stored some 55,000 drums containing waste oil, waste alkali, and other contaminants in the open in forests and farmland covering approximately 5,000m^2 within the city. Because the drums, which had been left in the open for many years, began to leak waste oil and cause environmental pollution in the surrounding area, the prefecture issued a subrogation for removal and disposal of the drums as well as removal of contaminated soil. This resulted in a cost of some 3.6 billion yen.

Source: Ministry of the Environment

At the time, however, there was a tendency to select waste treatment businesses that would undertake their operations as cheaply as possible despite the risks of inappropriate treatment. This was the tendency towards what is sometimes called "bad money drives out good." Moreover, the legal system at the time was characterized by the following aspects:

1) There was no system to confirm proper treatment of the industrial waste at each step of the treatment process.
2) A management system for proper treatment by businesses that generate large quantities of waste had not been established.
3) Inferior businesses with malicious intent, such as those who have connection with gangsters in their management, had not been excluded from the market.

Furthermore, extensive coverage of illegal dumping of waste by the media led to public skepticism on the necessary construction of waste treatment facilities. This resulted in a "vicious circle" in which the shortage of appropriate treatment facilities led to increases in illegal dumping.

2.2. The PCB problem

Polychlorinated Biphenyls (PCBs) had been used in a wide range of items including electronic devices. However, the "Kanemi Oil Poisoning Incident" of 1968 led to a ban on the new production and use of PCBs in 1974.

In order to respond to this situation, the "Denki PCB Shori Kyokai" (the Association of the Treatment of PCB in Electronic Devices, established in 1973) and other organizations tried numerous times to build facilities for treating PCBs; however, such efforts were unable to dispel local residents' strong concerns about exhaust gases and other issues, and thus they failed to gain public acceptance to prepare treatment systems.

Consequently, a large amount of PCBs has remained in storage for nearly 30 years without being processed. It has been reported that the danger of environmental pollution exists because, during this time, PCBs could be lost and their storage conditions have deteriorated.