

Chapter 2

Environmental Policies and Private Sector Responses During the High Economic Growth Period in Japan

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In this report, I will review, first of all, the history of economic growth and industrial pollution in Japan as well as Japanese Government's policy toward pollution measures. Then I will outline the pollution prevention measures implemented by Japanese industries. Lastly, I will conclude the report by enumerating the policies and measures that can aid the harmonious achievement of environmental conservation and sustainable economic development.

1. History of Economic Growth and Industrial Pollution in Japan

1.1 High Economic Growth in 1950's and 1960's

After a remarkable economic recovery following the World War II, Japan entered its high economic growth period from 1950's. As shown in Graph 1 "Net Annual Economic Growth in Japan," its net economic growths were high at 10.9% in 1950-1955, 8.7% in 1955-1960, 9.7% in 1960-1965, and 12.2% in 1965-1970.

The background of these high economic growths was the structural development of Japanese industries. To be specific, Japanese industrial structure shifted from the one of so-called light industries, i.e. textiles and foods, as its core industries to the one called heavy and chemical industries, i.e. steel, machinery and chemicals. This implied that Japanese economy inclined toward energy consuming industries. The end consumption of energies in Japan expanded from 51.3 million tons in oil equivalent for 1955 to 145.8 million tons in oil equivalent for 1965, the three-fold increase of energy consumption in 10 years. Energy sector made structural changes also, converting the fuel mix of oil 19.2% and coals 49.2% in 1955 to oil 58.0%

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and coals 27.3% in 1965, making a major change in the composition of energy sources from coal-dominated system to oil-dominated system.

The industrial area at the outskirts of megalopolis such as those in Tokyo, Kawasaki and Chiba cities, however, experienced increasingly severer air pollution since the mid 1950's, and extensive industrial pollution became a major social problem.

1.2 Seriousness of Industrial Pollution

Around 1960, pollution problems became increasingly serious with the outbreaks of extremely severe health damages such as asthma, mercury poisoning and cadmium poisoning all due to air and water contamination around petroleum factory complexes and other industrial areas. In response to such industrial pollution problems, the Government of Japan took legislative measures, including the enactment of "the Law Concerning Preservation of Water Quality in Public Waters" and the "Law Concerning Regulation of Industrial Effluent" in 1958 and the introduction of "the Law Concerning Control of Emissions of Smoke and Soot" in 1963. Guided by these laws, the Government gradually developed the system of pollution administration.

Despite the efforts, however, industrial pollution continued to exacerbate throughout Japan. The annual average of atmospheric sulfur dioxide (SO₂) concentration reached its peak at 0.059ppm in fiscal 1967. Moreover, disputes between factories and neighboring communities flared up frequently with a series of pollution litigation followed. For this, the Government established the Council for Pollution Measures to address comprehensive measures, and introduced the Basic Law for Environmental Pollution Control in the next year, 1967, and Air Pollution Controlling Law in 1968.

1.3 Strengthening National Pollution Measures

After 1968, another series of pollution, including lead poisoning by automobile exhaust gas, photochemical smog and sludge sedimentation, emerged and imposed serious social problems, advocating a call for the further strengthening of pollution control measures. The Diet (Japanese congress) session opened in 1970 was later called "the Diet on Pollution" and proceeded with the enactment and revision of 14 pollution-related laws and regulations, represented by the revision of the Basic Law for Environmental Pollution Control and the reinforcement of emission standards under the Air Pollution Controlling Law.

These laws and regulations specifically aimed to proclaim the conservation of citizens' health and living environment, to strengthen the authoritative power of municipalities over pollution control and to expand the regulatory coverage of pollution. Furthermore, the Diet adopted the laws determining the corporate responsibilities, including the "Law Concerning Entrepreneurs' Bearing of the Cost of Public Pollution Control Works," which would require business entities to bear the expense of pollution prevention projects, and "the Law for the Punishment of Environmental Pollution Crimes Relating to Human Health."

In addition, the Government of Japan established the Environment Agency in 1971, for comprehensive administration of environmental protection in order to integrate various administrative functions (establishment of environmental standards, control of pollutant emission at factories etc.) on environmental concerns dispersed throughout ministries and agencies. The Government also introduced the arbitration system for pollution disputes in 1972.

2. Industries' Response toward Pollution Prevention

2.1 Active Practice of Pollution Prevention Investment

Next, I will explain the response of Japanese industries against the rising industrial pollution and its prevention measures.

Initially, some companies were reluctant to implement pollution prevention investment, as they perceived it as an investment without producing profits. In order to encourage private companies to invest in this field, the Government of Japan introduced a preferential tax measure, in which private companies effectuating pollution prevention investment, such as the investment on installing new facilities to meet pollution control regulation, would be allowed to apply a special depreciation method for depreciating pollution prevention facilities.

Moreover, the Government introduced a program of low interest loans for such investment through government funded financial institutions. Because of such measures, private companies became active in pursuing such investments. Graph 2 indicated the history of low interest loans for pollution prevention offered by the government funded financial institutions. As a system to loan investment fund needed for pollution prevention, the loan system was started in 1965 and rapidly increased loan amount from 1.6 billion yen for fiscal 1965 to 351.7 billion yen in fiscal 1975.

Backed by the governmental support system, private companies multiplied their pollution prevention investment year by year. Graph 3 showed the trend of private company investment toward pollution prevention facilities. As shown here, the investment amount increased by 35-87% each year over its previous year since 1967 up till 1971. In terms of the types of facilities invested, almost 60% or more were for those related to air pollution prevention. The actual amount of pollution prevention investment was 964.5 billion yen in 1975, 16.1% of the total investment amount on industrial equipment, which was a sharp increase over the share of 3.4% recorded in 1970. It seems quite interesting to note that the year of 1975 when the pollution prevention loans by government funded financial institutions peaked coincided with the peak year of private companies' investment on pollution prevention.

2.2 Active Measures for Technological Development

Companies exerted extensive efforts to develop technologies and equipment for pollution prevention, including electric dust collectors, flue desulfurization, and flue denitrification. Graph 4 illustrated the yearly installation of flue desulfurization devices. As shown, only 102 units of desulfurization devices in 1970 was 20-folded to 2,014 units in 1991, while the desulfurizing capacity of each device unit increased drastically.

As a countermeasure, the sulfur content in fuels was reduced through the desulfurization of heavy oil. Graph 5 indicated the average sulfur content of heavy oil used for domestic demand (Heavy oil A, B and C). According to the graph, the sulfur content dropped from 2.60% in fiscal 1965 to 1.02% in fiscal 1991.

In 1969, Japan started to import less sulfur content LNG (Liquid Natural Gas) for use in city gas supply. This substitution to LNG was an effective measure in preventing urban air pollution. Moreover, in 1970, the Tokyo Electric Power Co. (TEPCO) started the operation of the world's first power plant using non-sulfur LNG. As of fiscal 1998, LNG fueled power generation shared about 28% of gross power generation capacity in Japan, surpassing all other fuel sources including oil and nuclear.

As a result of each company's practice of air pollution prevention measures, the emission of sulfur oxide decreased and the annual average of atmospheric sulfur dioxide (SO₂) concentration plunged from 0.059ppm in 1967, which was the highest in the past, to 0.009ppm in 1992.

Private company's efforts in the research and development and investment to clear and overcome environmental control standards led to the advancement in technological levels, and the strengthening of competitive power. For example, in case of automobile exhaust gas control, emission reduction was realized by first setting the regulatory limit on exhaust gas emission from cars, which was effective after a designated year allowing sufficient lead time for automobile manufacturers to respond by the development of appropriate technologies. The regulation introduced in 1975 fixed the automobile exhaust gas at the level equivalent to the automobile exhaust gas control in the United States (U.S.) for 1975-1976 set in the U.S. Clean Air Act (so-called Muskie's Law) of 1970.

Japanese automobile manufacturers exerted extensive efforts in technology development and achieved the required emission limit to enable the enactment of the regulation in 1975-1978. The emissions of the chemicals subjected to this control were over 90% less than those before the enactment of the regulation, attracting attentions from international community as the emission gas measures with emission limit surpassing the limit set in the U.S. Later, Japanese automobile manufacturers conformed to even severer restrictions through the improvement of engine designs, development of exhaust gas purifiers, and the advancement in body structures, thereby achieved excellent competitiveness in the world market to date.

2.3 Internalization of Pollution Prevention Cost

For the burden sharing of pollution prevention, the Polluters Pays Principle (PPP) has been established. Private companies would appoint, beside the conventional thermal management personnel, pollution prevention manager(s) as stipulated in the law, and actively addressed the measures to reduce pollution prevention costs. To become pollution prevention managers requires either to pass the national examination for pollution prevention, or to complete the licensed training. Up to date, the number of people who either passed the national examination or completed the training exceeded 470,000 people, and contributed greatly to encourage private companies to voluntarily adapt pollution prevention measures.

Moreover, the government subsidies for pollution prevention related technology development, equipment investment and the provision of tax exemplification system for private companies further promoted the companies' efforts in internalizing and reducing pollution prevention costs.

2.4 Communication and Coordination with Local Communities

At first, factories had severe confrontation with neighboring residents over pollution problems, but later they started to respond to the demands from residents and municipalities as the matter of "company's social responsibility," and made efforts in obtaining the understanding of local residents. As a result, companies started to enter pollution prevention agreements¹ with local municipalities and to effectuate the communication and information services to local residents.

3. Conclusion

Energy consumption has strong relevance to environmental pollution. To improve energy intensity by enhancing thermal and energy efficiency is effective not only for economic efficiency but also for the control of total pollutants. Reduced fuel consumption through energy conservation has greatly contributed to lower the emission of pollutants, for example, Sulfur Oxide.

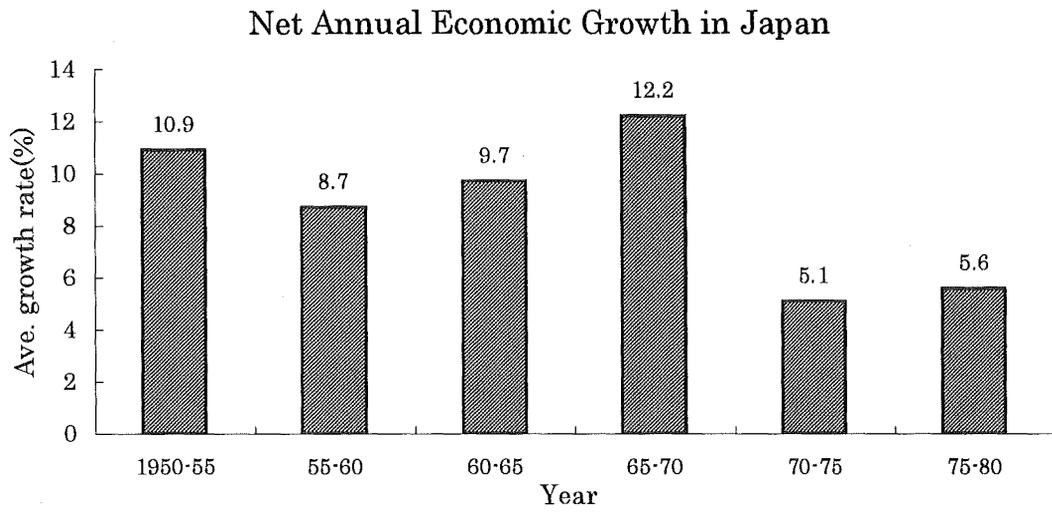
Above facts clearly suggest that the energy conservation policy is critical not only from the perspectives of rationalizing country's industrial structure and improving its competitiveness, but also in terms of environmental preservation.

Many companies have already learned that a significant amount of compensation fee, which might follow lawsuits, would not be acceptable economically. The environmental loads of products or the burdens on industries would come to influence costs as well as consumers' behavior to purchase.

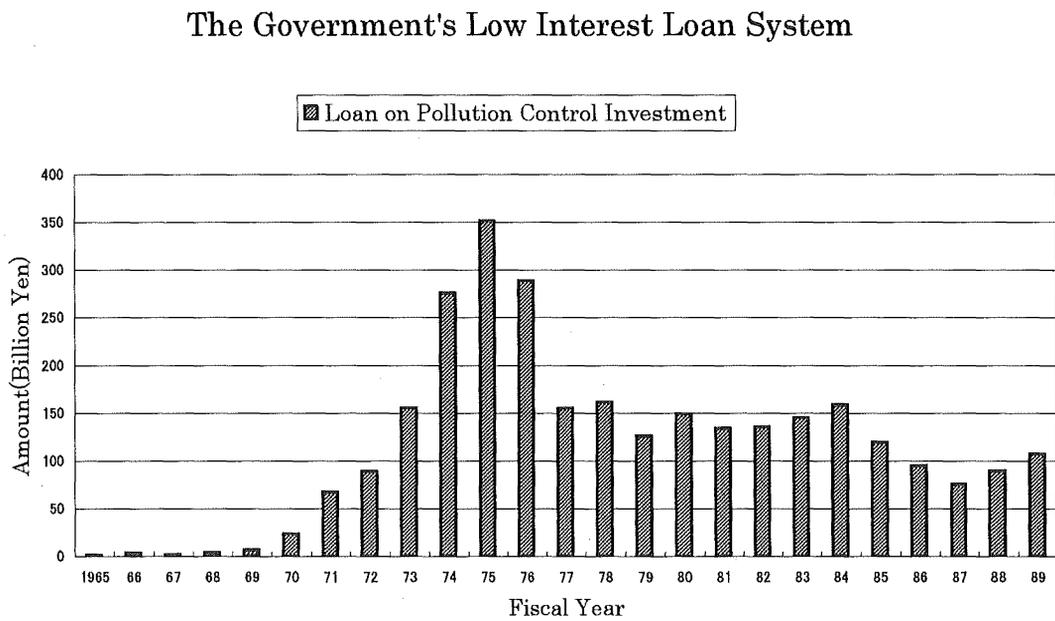
These were the reason why companies, especially manufacturers in Japan, exerted efforts to implement industrial pollution control and successfully attained sustainable production.

¹ These agreements were made between municipalities and pollution source entities, and involved mutual agreement developed after the discussion of pollution prevention measures, including pollution control standards, and a duty to discuss upon the expansion of production facilities. These agreements became unique and powerful instruments in Japan supplementing the regulation under laws and acts.

Graph 1

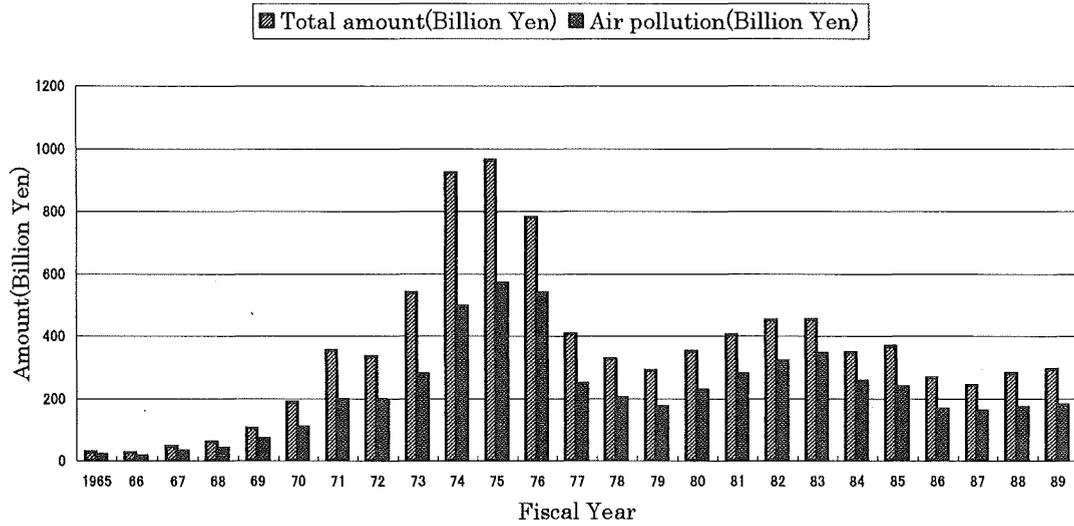


Graph 2



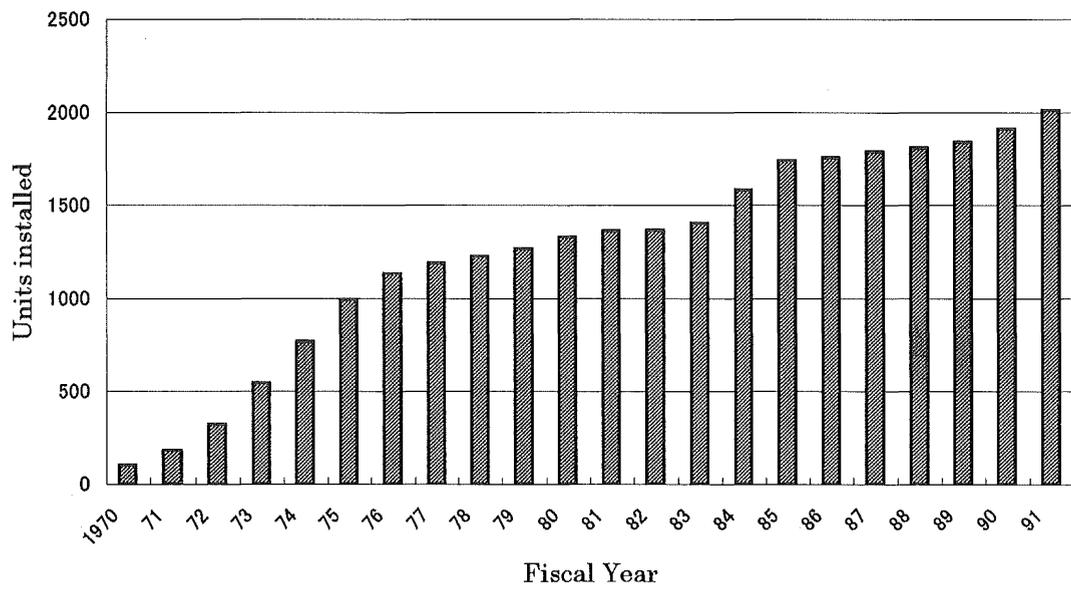
Graph 3

Industrial Investment on Pollution Control



Graph 4

Fuel Desulfurization Devices



Graph 5

Average Sulfur Content in Domestic Heavy Oil

