

Part I Development and the environment:  
experiences of Japan : 5.A critical review of  
pollution issues and environmental policy in  
Japan

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# 5

## A Critical Review of Pollution Issues and Environmental Policy in Japan

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### I. INTRODUCTION—THE PURPOSE OF THIS PAPER

The East Asia region—consisting of South Korea, Taiwan, Hong Kong, and Singapore (hereinafter referred to as Newly Industrializing Economies, or Asian NIEs)—has attracted attention due to its dramatic economic growth in the 1970s and 1980s. Going into the 1990s, however, these Asian NIEs, with the possible exception of Singapore, are confronted with the twin problems of industrial pollution and urban pollution. This means that Asian NIEs, under pressure to pay the “overdue bills” they incurred during their stunning economic successes in recent years, are now being urged to establish and promote effective environmental policies to solve their numerous pollution problems, which are becoming more and more serious.

This paper reexamines the history of pollution issues in Japan, the remedial measures that were formulated in the course of dealing with them, and Japan's environmental policy. Since Japanese pollution issues provide a useful precedent and very instructive in helping Asian NIEs develop and promote their own environmental policies, the author hopes that this paper will be of some help in examining what lessons Asian NIEs can learn from the Japanese experience.

### II. HISTORICAL OVERVIEW OF POLLUTION ISSUES IN JAPAN

Japan has faced a number of serious pollution incidents with the beginning of rapid industrialization during the Meiji era (the latter half of the nineteenth century). This means that the history of Japan's industrialization, which began at that time, coincides exactly with the country's history of pollution. Reexamining the history of Japan's pollution issues is of great significance in discussing the establishment and implementation of environmental policy in Asian NIEs, which have had severe pollution problems since the 1970s in patterns similar to the Japanese experience. With this in mind, I shall give a brief overview of the history of pollution problems in Japan.

## 1. Pollution Problems before the Meiji Era

From the Meiji era on, Japan vigorously pursued a national policy of modernization and industrialization under the banner of “enrich the country and strengthen the military” (*fukoku kyohei*), and “increase production and promote industry” (*shokusan kougyou*). This industrialization policy also marked the dawn of pollution in Japan. Before the Meiji era, Japan did have some cases of premodern industrial pollution, the most typical being environmental damage caused by mining that was active across the country during the Edo period. Most pollution problems before the Meiji era were those involving damage to agriculture and fishing by untreated toxic effluents from gold, silver, copper, iron, and sulfur mines flowing into rivers. In other words, pre-Meiji pollution problems consisted in conflicts and disputes between the interests of different industries, that is, effluent discharge by the mining industry and water utilization by the agriculture and fishing industries. Furthermore, up to the Edo period most of these conflicts and disputes were resolved socially by putting the interests of farmers ahead of miners, and giving greater importance to farm production than to the promotion of mining. In such circumstances, it can be safely said that pollution in those days never got as serious or widespread as during and after the Meiji era.

## 2. Aggravation of Pollution in the Meiji Era

As Japan entered the Meiji era, however, mining pollution similar to that in pre-Meiji times began to cause severer and more extensive damage. In addition to mining-related pollution, there began to appear other types of pollution problems that were traceable to the rise of various manufacturing industries. Among them, the acute pollution problems at the four largest mines in Japan—Ashio, Besshi, Hitachi, and Kosaka—symbolized the historic tragedy that accompanied the process of modern industrialization under Japanese national policy during that era. Pollution at the four mines came to the nation’s attention in close succession from the middle of the Meiji era (the decade from 1887) to the period’s late years (the decade from 1907), and the extensive damage involved led to critical social issues. During this time, the government accelerated its policy of industrialization, which had been introduced in the early Meiji era, by placing greater emphasis on the development of domestic mines with the aim of increasing mining and manufacturing production. It should be noted that the most important historical event in this period was Japan’s victory in the Sino-Japanese War (1894-1895), the first war Japan fought in its modern history. With this unfortunate victory, the Meiji government pushed ahead with its policy of building an imperialistic and militaristic nation in a manner termed the “Post-Sino-Japanese War Operation.” Under the slogans “enrich the country and strengthen the military” and “increase production and promote industry,” the government gave top policy priority to a rapid increase in copper production, which was the most important source of hard-currency revenue at the time. The government’s production-first policy was most vigorously followed at copper mines, particularly the aforementioned Ashio, Besshi, Hitachi and Kosaka mines.

From the initial stage of their development, these mines had caused a variety of damage by smoke and water pollution, which were evidently “damage caused in the public interest.” But neither the government, which supervised mining firms, nor the mine operators themselves showed any concern for the damage caused by the copper mines. Instead, the acceleration and increase of the pollution and damage at these four mines were publicly condoned in the interests of national protection. Indeed, copper was considered all-important in Japan of that time. In particular, copper poisoning and smoke pollution at these four mines were

seen as something that had to be tolerated for the sake of national interests. Farmers who protested the damage from copper poisoning and smoke pollution were regarded as “traitors to or opponents of the state.” Under such circumstances, Ashio mine pollution resulted in severe political oppression and had a tragic ending. The serious aftereffects of the Ashio case lingered on into the post-World War II era, and even today its scars have not completely healed. The situation was much the same at Besshi, Hitachi, and Kosaka. In contrast to Ashio, however, there was noteworthy progress in some areas, such as compensation for damage and technical measures to prevent and eliminate mine pollution and smoke, though these were implemented only after anti-pollution protests by farmers who suffered from the effects of the pollution. In particular, the “Smoke Compensation Agreement” concluded for the first time in Japan at Besshi, and smoke control measures based on meteorological measurements are noteworthy anti-pollution measures implemented in the Meiji era in Japan.

### 3. Changes in Pollution Issues in the Taisho Period and the Early Showa Period

With the end of the Meiji era, the process of industrialization in Japan came to a historic turning point. In the period covered in this chapter, particularly in the 1920s, the heavy and chemical industries increased their importance in the manufacturing sector, a process that was referred to as “first-phase heavy and chemical industrialization” to distinguish it from a similar pattern of industrial development in the postwar period. At the same time, Japan underwent a rapid transformation from an agrarian society to an urban society, which is similarly referred to as “first-phase urbanization.” In addition, the four largest prewar industrial area of Keihin, Chukyo, Hanshin, and Kitakyushu, began to emerge during this period. Against the backdrop of these changes in Japanese society, the focus of pollution problems in Japan gradually shifted from pollution originating from mining operations in the Meiji era to “factory pollution,” which involved various manufacturing industries as the pollutant sources. For example, the “Table of Changes in Industrial Pollution Incidents by Cause” prepared from the “Annual Report on Factory Supervision” published by the Social Bureau of the Ministry of Interior in the early Showa era indicated frequent occurrences of pollution caused by liquid wastes, gas steam, suspended particulates, and other substances at many places. The pollution sources came from a number of industrial sectors, ranging from cement, rayon, dyeing, coke, and synthetic fertilizer to paper mills, metal products, pharmaceuticals, and ceramics. The broader notion of “environmental pollution” (*kogai*) gradually began to take root in Japan, thus replacing narrowly defined occurrences such as mining damage and smoke pollution. In this period, the emergence of the chemical industry gave rise to environmental problems classified as “chemical pollution.” This resulted from the reckless pursuit of quick advancement for the chemical industry in utter disregard of safety, and it represented the historical start of a subsequent series of grave pollution incidents caused by the postwar chemical industry.

Another important feature of pollution issues in this period was the appearance of “urban pollution.” Especially in Osaka, which was then called “a city of smoke,” damage from soot and smoke was extremely serious. Kujuro Fujiwara, who headed the Osaka Municipal Research Laboratory for Public Health at the time, pointed out that soot and smoke had caused serious health damage to poor people living in inferior housing. To deal with this problem, the Osaka Urban Association, established in 1925, set up the Research Commission for Smoke Prevention in 1927 and organized a fairly active movement against the soot and smoke problem as a joint public-private effort that included the Osaka prefectural government, the city government, and plant managers, as well as public health and fuel experts. But this move-

ment failed to achieve the participation of local residents, who were the real victims of the smoke damage, and this failure reflected the lack of full awareness among these people of their rights as citizens. For this reason, the anti-smoke movement became more like a campaign to improve the use of fuels, and eventually was transformed into, and absorbed into, the industrial rationalization movement amid Japan's rapid transition to a war economy.

As outlined above, Japan experienced a variety of serious pollution problems from the very beginning of its industrialization, but development and implementation of measures to solve these problems had to wait until after the end of World War II.

#### **4. Further Aggravation of Pollution in Postwar Japan**

Japan suffered a devastating blow owing to its painful defeat in World War II. But the nation got back on the track of economic recovery in the 1950s and followed the path of high economic growth from the 1960s onward, in what is termed "the Japanese miracle." In the course of its remarkable postwar economic expansion, however, Japan once again endured the tragedy of serious damage from frequent industrial pollution, and on a much larger scale than in the prewar era. The two Minamata disease incidents (methylmercury poisoning in Kumamoto and Niigata prefectures), itai-itai disease (chronic cadmium poisoning in Toyama Prefecture) and Yokkaichi air pollution (asthma from serious air pollution in Mie Prefecture) are the four most serious cases of pollution symbolizing Japan's traumatic postwar experience. All were serious incidents that forced Japan and its people to thoroughly reexamine the policy of economic growth pursued in the prewar and postwar periods. In particular, Japan's high economic growth from the 1960s on was accompanied by problems that were more serious than those in the prewar period.

First, high economic growth was achieved through structural distortion of the Japanese economy, which resulted in increasing imbalances among different industrial sectors and among different regions. In the 1960s, when construction of the heavy and chemical industrial complexes was encouraged as a matter of national policy, land reclamation from the sea was undertaken—on a scale unprecedented anywhere in the world—in such places as Tokyo, Ise, and Osaka bays and in the Seto Inland Sea, with the purpose of developing major coastal industrial areas near big cities and port facilities. In the period from 1960 through the late 1970s, for example, approximately 20,000 hectares of land were reclaimed from Tokyo Bay, and some 30,000 hectares in coastal areas of the Inland Sea. This large-scale land reclamation for industrial use and port facilities contributed greatly to Japan's industrial production, which was heavily dependent upon the heavy and chemical industries. However, this resulted in a worsened structural capacity excess in these industries after the two oil shocks of the 1970s. Moreover, the land reclamation projects resulted in irreversible damage to the environment by destroying ecosystems and the magnificent views of natural shorelines in these bays and coastal areas. What has been lost in this process is immeasurably large in terms of the environment. Furthermore, this policy of economic growth, with a disproportionate emphasis on the heavy and chemical industries, led to the collapse and destruction of "local economies," which was caused by "the economic might of the state." As Japan's national economy became very strong, its local economies lost their own footings and became extremely fragile. Above all, the economies of local communities based on the primary industries of agriculture, forestry, and fisheries were structurally damaged to the point of disintegration.

Second, as a result of the development described above, urban areas in the Pacific Belt linking Tokyo, Nagoya, Osaka, Hiroshima, and Fukuoka turned into communities that fre-

quently suffered from the twin problems of industrial pollution and urban pollution. In 1970, pollution-related complaints brought to local authorities by residents in Tokyo, Osaka, and Nagoya alone topped 3,000, or an average of approximately 10 cases a day. These figures are astonishing, considering that the number of such complaints usually represents just the tip of the iceberg. Indeed, the nation's three largest metropolitan areas at the time faced a horrific situation in which constant suffering from various pollution-related problems became an everyday occurrence.

Third, this period of economic growth witnessed repeated occurrences of "criminal pollution," as exemplified by the four aforementioned major pollution cases, which were the most tragic events in postwar Japan. In the name of "the interests of industry," even serious violations of human rights, in which the life and health of local residents were endangered, were tolerated. The public sector failed to perform its essential function of implementing effective relief measures for victims of pollution-related maladies. In this respect, it is very unfortunate that Japan learned so little from the tragedy of Ashio copper mine pollution in the Meiji period.

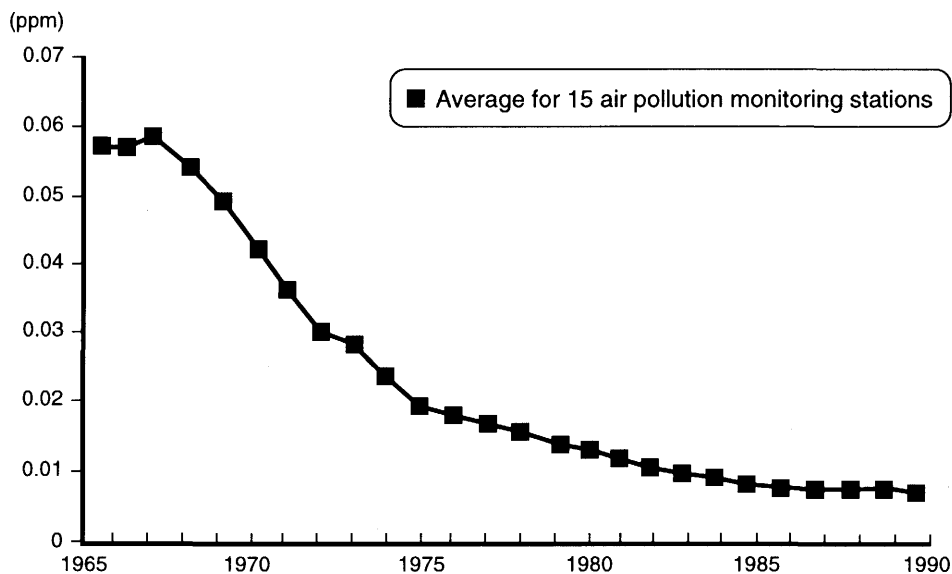
### III. CRITICAL ANALYSIS OF "SUCCESSFUL" ANTI-POLLUTION MEASURES IN JAPAN

The previous chapter was a quick review of the evolution of pollution issues in Japan from the Meiji period, when Japan set out on the path to industrialization, through the postwar period of high economic growth. What seems to be obvious is that damage from pollution was largely neglected until the postwar period of high economic growth. On the surface, this can be seen as an indication that Japan could achieve industrialization, starting in the Meiji era, only by neglecting to carry out remedial measures against pollution. The lesson to be learned from this experience is a negative model for the pattern of economic development, in which industrialization and the resultant rapid economic expansion without due regard for necessary pollution control measures leave huge "bills" that have to be paid later. Though rather belatedly, Japan began to introduce anti-pollution measures in the latter half of the 1960s. The following section will examine remedial measures to control SO<sub>x</sub> air pollution, which is generally regarded as one of the most successful pollution control measures ever taken in Japan.

#### 1. Measures for SO<sub>x</sub> Control since the Latter Half of the 1960s

First, we'll briefly look at the history of the SO<sub>x</sub> control measures that were finally launched in Japan in the latter half of the 1960s. The passage of the Smoke Control Law of 1962 marked the first legal step to cope with SO<sub>x</sub>-caused air pollution. The law imposed regulation on the concentrations of sulfurous acid gas and anhydrous sulfuric acid, though only under very loose emission standards, which were even lower than the level achieved at the Besshi mine operated by Sumitomo Metal Mining Co. From the beginning, therefore, it was totally impossible to prevent damage from sulfurous acid gas under the standards of the Smoke Control Law. Following the enactment of the former Basic Law for Environmental Pollution Control of 1967, the Air Pollution Control Law replaced the Smoke Control Law in 1968. Instead of the previous method of regulating SO<sub>x</sub> emission at outlets, the new law introduced the K-value control method, in which regulation is imposed according to the height of stacks. In 1969, environmental standards for SO<sub>x</sub> were finally established. Still, the environmental standards introduced were lower than the safety standard to protect human

**Figure 1** Trend of Concentration of SO<sub>2</sub> Average Annual Value  
(Average Concentration for Continuously Monitoring Stations)



Note: Annual average is the quotient of the sum of all one-hour values per year divided by the total measured hours.

Source: S. Matsui, *Industrial Pollution Control in Japan*, p. 31.

health set by the World Health Organization (WHO). The environmental standards were tightened in Japan only after the amendment of the Air Pollution Control Law in December 1970, which, in the course of intense debate during the special Diet, deleted the clause concerning "harmonization with economic activity" that had been in the former Basic Law for Environmental Pollution Control. The 1970 amendment of the Air Pollution Control Law introduced seasonal SO<sub>x</sub> standards for the use of fuels in designated areas. Smoke diffusion is very weak in urban areas during winter, and when there is a large increase in the consumption of fuels for heating and other uses, K-value regulation alone is not effective. A more direct control on fuels is required.

It can be said that in Japan SO<sub>x</sub> emission regulation was gradually tightened from 1970 in real terms, but regulation was still directed at individual emission sources. While this was to a certain extent able to achieve reductions in the total emissions from individual sources, such individual control was not effective in achieving the desirable level, represented by environmental standards, in areas like industrial complexes, where sources of SO<sub>x</sub> emissions are concentrated. In order to overcome this limitation, the Air Pollution Control Law was again amended in 1974 to introduce areawide total pollutant load control in designated areas with many emission sources. Under this formula, the permissible amount of an air pollutant in a designated area is scientifically estimated to conform to its environmental standard, and a stricter emission control is applied to individual sources to keep the total emission quantity below the permissible level. For SO<sub>x</sub> emissions, the number of designated areas for areawide total pollutant load control has been increased three times since 1974.

Figure 1 indicates that as far as SO<sub>x</sub> control measures are concerned, Japan has made a great success since the 1970s.

**Table 1** Average Sulfur-content Rate of Imported Oils

(%)

| <i>Year</i> | <i>For fuels</i> | <i>For non-fuels</i> |
|-------------|------------------|----------------------|
| 1967        | 1.93             | 1.93                 |
| 1968        | 1.03             | 1.82                 |
| 1969        | 0.99             | 1.69                 |
| 1970        | 1.28             | 1.58                 |
| 1971        | 1.04             | 1.55                 |
| 1972        | 0.77             | 1.49                 |
| 1973        | 0.47             | 1.43                 |
| 1974        | 0.31             | 1.48                 |
| 1975        | 0.20             | 1.47                 |
| 1976        | 0.18             | 1.45                 |
| 1977        | 0.14             | 1.48                 |
| 1978        | 0.13             | 1.55                 |
| 1979        | 0.13             | 1.55                 |
| 1980        | 0.12             | 1.53                 |

Source: Japan Federation of Oil Companies.

## 2. Reasons for the success of Japan's SO<sub>x</sub> control measures, and their limitations

In a 1977 report reviewing Japan's environmental policy, the Organization for Economic Cooperation and Development declared that Japan had won its battle against serious environmental pollution, which was a sign that the anti-pollution measures Japan had enacted through the mid-1970s had been internationally recognized. In giving high marks to Japan's policy, the OECD was apparently thinking of the air pollution control measures mainly for SO<sub>x</sub> emissions, which had been implemented since the latter half of the 1960s. The OECD review concluded that Japan's pollution control measures, as represented by its fight against SO<sub>x</sub>, achieved noticeable success through strict and direct administrative regulation. But it should be noted that at least two important issues were not mentioned in the OECD report's conclusion.

First, one characteristic of Japan's anti-pollution measures is their *ex post facto* nature, meaning that they were enacted only after the occurrence of extremely serious damage, including irrevocable damage to the health of citizens. In this sense, the Japanese experience should be regarded not as an example of pollution control success, but rather as a serious failure that should never be repeated. The OECD report failed to make this point clear.

Second, one might admit that, in the total context of Japan's pollution control measures—all of which were taken too late, Japan's SO<sub>x</sub> control measures can be counted as an exceptional success with a remarkable outcome. Still, there has to be a more careful, critical analysis of the reasons for that success, and its limitations. Japan at the time had four options for dealing with SO<sub>x</sub> emissions: 1) Reducing the sulfur content of fuels or raw materials; 2) desulfurization of smoke by reducing atmospheric emissions; 3) raising the height of stacks to help reduce or diffuse the ground-level SO<sub>x</sub> concentration; and 4) measures to encourage alternative energy sources by shifting to energy sources with lower SO<sub>x</sub> emission, such as liquefied natural gas (LNG). In the late 1960s, Japan first started using low-sulfur oil. Because Japan depended on the Middle East for most crude oil imports, the goal appeared to be feasible by simply seeking crude oil with a lower sulfur content. But increasing imports of



**Table 2** Anti-Air Pollution Investment in Japan Related to SO<sub>x</sub> Emission

(¥ million)

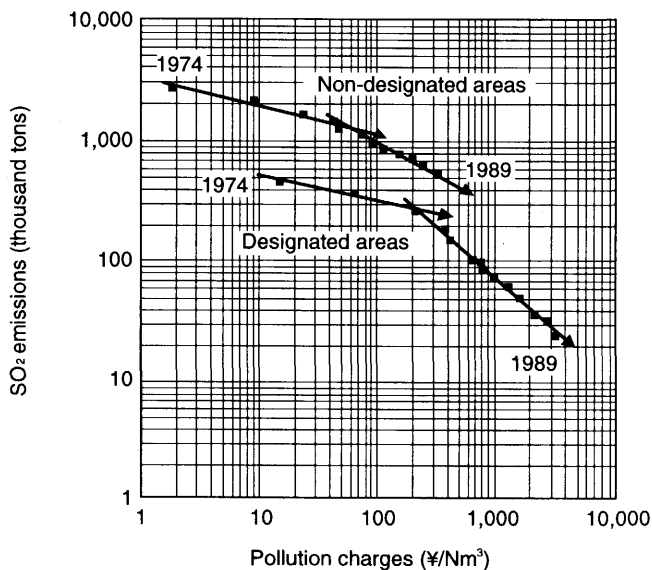
| <i>Year</i> | <i>High-raised stack</i> | <i>Heavy oil desulfurization</i> | <i>Flue gas desulfurization</i> |
|-------------|--------------------------|----------------------------------|---------------------------------|
| 1966        | 1,521                    | 85                               | 267                             |
| 1967        | 4,037                    | 11,348                           | 800                             |
| 1968        | 4,728                    | 18,811                           | 2,021                           |
| 1969        | 11,198                   | 23,860                           | 1,258                           |
| 1970        | 18,131                   | 9,892                            | 3,634                           |
| 1971        | 29,505                   | 16,010                           | 8,247                           |
| 1972        | 9,126                    | 24,436                           | 14,923                          |
| 1973        | 9,536                    | 38,099                           | 37,757                          |
| 1974        | 7,886                    | 29,282                           | 146,713                         |
| 1975        | 6,651                    | 79,676                           | 95,204                          |
| 1976        | 10,355                   | 47,562                           | 98,044                          |
| 1977        | 3,813                    | 5,419                            | 45,003                          |
| 1978        | 5,552                    | 954                              | 20,807                          |
| 1979        | 4,981                    | 1,089                            | 11,593                          |
| 1980        | 6,215                    | 9,759                            | 26,428                          |

Sources: Japan Federation of Oil Companies and Japan Association of Industrial Machinery.

low-sulfur oil would naturally raise the price of imported oil. For this reason, the Japanese government, which had been pursuing a policy of high economic growth through structural dependence on cheap imported oil, was reluctant to pursue the first option and backed away from appropriate administrative guidance for oil and other industrial sectors. Here, it should be noted that it was municipal and other local governments, which are closest to local citizens affected by air pollution, that pressed for implementation of the measure. In this respect, the significant role played by the postwar development of "local autonomy as the autonomy of residents" should not be neglected. It is also important to note that after the latter half of the 1960s the Japanese economy was, fortunately, strong enough to afford the higher cost of switching to high-quality crude oil imports. Be that as it may, in that period of time the first policy option of reducing the sulfur content of fuels was highly effective in lowering SO<sub>x</sub> emissions. Table 1 shows that this effort rapidly lowered the sulfur content of imported crude oil, particularly that of the oil used as fuel.

Since the introduction of the K-value regulation method, the third policy option of raising stack height performed a pivotal role in combating SO<sub>x</sub> air pollution. The characteristic of regulation theory under the K-value control method meant that the permissible emission level expands as much as four times when the height of stack is doubled. Thus as a measure to control air pollution, this method is not a technology that provides a fundamental solution to the problem, but rather a way of diffusing the problem over a wider area. In fact, as later developments indicate, it led to a much worse outcome by causing ever more extensive pollution such as acid rain. Nevertheless, Japan promoted this measure as national policy from the late 1960s through the first half of the 1970s. Table 2 shows the rapid spread of high-rise stacks as a result of air pollution control investment after the 1968 enforcement of the Air Pollution Control Law, which introduced the K-value control method. But this kind of investment was far from satisfactory in terms of controlling pollution. The positive side and the negative side of the third option must be reexamined from a scientific point of view so that misguided pollution control measures are not repeated in Asia and other parts of the world.

**Figure 2** Correlation between SO<sub>2</sub> Emissions and Pollution Charges in Designated and Non-designated Areas



Source: K. Kato, *The Use of Market-based Instruments in Japanese Environmental Policy*.

The biggest technological success in Japan's SO<sub>x</sub> measures includes progress in desulfurization technology, cited above as the second policy option. The development of heavy oil desulfurization equipment is also worth mentioning as a technology developed by Japan on its own, though it falls into the same category as the first option of reducing the sulfur content of fuels. These measures, as indicated in Table 2, were steadily put into practice from the late 1960s through the 1970s. It is no exaggeration to say that the investment in stack and heavy oil desulfurization equipment accounted for the largest portion of the increase in air pollution control investment during this period. But there is still something that should be underscored regarding progress in Japan's pollution prevention technology: A detailed study must be made of the socioeconomic background and mechanisms that prompted Japanese industry to aggressively develop and install desulfurization technology. In this respect, we must take careful note of the Pollution-Related Health Damage Compensation System, a unique program established in Japan after lawsuits over the four most serious pollution incidents in the postwar years. More precisely, we should take note of the positive role played by the pollution load levy system for SO<sub>x</sub>, which was incorporated into the compensation mechanism. This system was introduced with the original purpose of raising funds to compensate victims of pollution-related maladies. In reality, it turned out to be an extremely important economic incentive for the industries affected to actively seek the development and introduction of SO<sub>x</sub> emission reduction technologies (see Figure 2). In light of this, the Japanese experience with measures to remedy SO<sub>x</sub> pollution merits renewed attention at a time when there is an international debate concerning the so-called "environmental tax"—a tax as a charge for the stated aim of reducing pollution.

So far we have briefly outlined several reasons why the remedial measures implemented by Japan from the latter half of the 1960s to reduce SOx emissions enjoyed a degree of success. On the other hand, we must also examine their limitations. According to the results of a survey conducted in Kitakyushu, in which the author took part, the reduction in SOx emissions achieved through the aforementioned remedial measures was not as pronounced as had been estimated. Rather, significant factors that explain Japan's ability to cut SOx emissions can be found in the drastic changes that the nation's socioeconomic structure underwent in the latter half of the 1970s, such as 1) the structural recession and the resultant decline in the capacity utilization rate for the heavy and chemical industries, mainly petrochemical complexes, which were triggered by the 1973 oil shock; 2) the basic change in Japan's industrial structure, which previously placed excessive emphasis on the heavy and chemical sector; and 3) the slowed growth of oil consumption due to promotion of various energy conservation measures. Moreover, a significant portion of Japan's heavy and chemical sector, which was responsible for serious air pollution damage from SOx emissions through the 1960s, was increasingly transferred to other Asian countries after the mid-1970s. The significance of this shift needs to be studied thoroughly and critically.

Given all the points discussed above, there seems to be a need for a more detailed and comprehensive examination, from a critical perspective, of Japan's experience with SOx control measures, which have long been viewed as an important success in controlling pollution since the latter half of the 1960s. Such a task becomes all the more important when there appears to be a tendency to accept the argument that Japan has been able to overcome serious environmental pollution by developing a variety of pollution control technologies.

#### **IV. CONCLUSION—CHARACTERISTICS OF JAPAN'S ENVIRONMENTAL POLICY AND FUTURE ISSUES**

We have reviewed the evolution of pollution issues in Japan through the early half of the 1970s with the focus on Japan's experience with SOx control measures, which reveal the very nature of Japan's pollution control policy because they have shaped the fundamental framework of Japan's more recent environmental policy. Japan's environmental policy, though only from around the latter half of the 1960s, evolved around "pollution control policy," the first important element of the nation's present environmental policy. But the situation reversed itself in the second half of the 1970s, and many movements for "countercurrent and retreat" became apparent in the area of pollution control policy. People anticipated that in the latter half of the 1970s Japan's environmental policy would advance to the next stage and move forward toward the second important area of "nature conservation policy," and then on to the third important area of "amenity improvement policy," thereby establishing a comprehensive environmental policy structure. But events went the other way, and overall environmental policy accelerated its drift toward "countercurrent and retreat," which continued until the second half of the 1980s. In 1989, global environmental problems abruptly emerged as a major political issue in Japan, and this helped bring about changes in the basic trend of the nation's environmental policy. One example is a major shift from the conventional policy framework of domestic pollution control measures to a new framework whose core theme is preservation of the global environment. But one must point out that in Japan this shift is emerging with some basic problems that can not necessarily be seen in a positive light. This shift is not necessarily serving as a factor that is effective in rolling back the trend of countercurrent and retreat,

which has dominated Japan's environmental policy since the latter half of the 1970s. Instead, there are growing signs that in some key areas, domestic anti-pollution measures are definitely retrogressing. This shows that despite the abrupt surge of interest in the global environment since 1989, the fundamental stance of Japan's environmental policy is being put to a severe test. With this in mind, and amid the changing situation since 1989, I would like to raise some points about basic problems confronting Japan's future environmental policy through a summary of this paper's discussion.

First, Japan must now seriously examine and summarize its environmental policy of the past 20 years. While the government has been preparing for the passage of a new Basic Environment Law since July 1992, so far the legislative process is far from satisfactory because a full and comprehensive examination of past environmental policy is not used as the basis for the new Basic Law. The future task and direction of Japan's environmental policy, which must satisfy the demands of the times, cannot be clearly defined without ascertaining the outcome and achievements of past policy, and also clarifying its defects and limitations. That is why we have to seriously examine and reappraise exactly how Japan's past environmental policy evolved and performed.

Second, after this process of examination and reappraisal, Japan is being urged to comprehensively integrate its environmental policy. As repeatedly discussed in the previous sections of this paper, the basic framework of Japan's environmental policy was formulated through the experience of coping with the host of pollution problems that occurred since the latter half of the 1960s. This history of development is the reason that policy has pollution control at its core. Looking at this characteristic from another angle shows that Japan's policy framework is quite inadequate for nature conservation and amenity improvement, both of which are essential areas for the comprehensive integration of modern-day environmental policy, and it lacks comprehensive organic links and balance among the three policy areas. With these problems in mind, Japan's new environmental policy must pursue the consolidation and systematization of policies in the three key areas.

Third, Japan's environmental policy should be redefined from an international perspective. In recent years, Japanese environmental policy has come to play an increasingly significant role in Asia. That significance is not limited to relations between Japan and other Asian countries that are linked by Japan's environmental official development assistance and technical cooperation. It is also necessary to make a thorough study and examination of such relations from the viewpoint of environmental conservation, including the specific forms of their environmental cooperation.

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