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# NEWSLETTER

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**THE JAPAN SOCIETY OF WASTE MANAGEMENT EXPERTS**

## Dear Waste Management Experts

Waste management, when improperly carried out, causes serious health and environmental hazards. In that sense illegal dumping of industrial waste, as improper practice, and dioxins, as substances, are two major concerns for people in Japan. This issue of JSWME NEWSLETTER deals with possible countermeasures against them, the Restoration Fund for illegal dumping of industrial waste and the Dioxins Control Law. Incidentally from this issue, we will begin a new series to introduce the most unique aspect of waste management in Japan – incineration – which may be one of the causes of dioxins.

Again we call your attention to our annual conference and the symposium to commemorate the 10th anniversary of JSWME, which will be held on Oct. 26 to 28 in Ohmiya, as well as the International Session. For interested parties, please contact the JSWME secretariat.

(by Hiroki Hashizume)

## Establishment of a Restoration Fund for Illegal Dumping of Industrial Waste

### 1. Background of the fund

In 1995, Japan saw 679 cases of illegally dumped industrial waste, amounting to 444,000 tons, which is still on the increase. In order to solve this problem, the following policies were incorporated in the Waste Management and Public Cleansing Law in June 1997, when the law was amended.

- 1) Expansion of the application of the manifest system to all industrial waste
- 2) Increasing the severity of the penalty (The maximum fine is JPY 100 million.)
- 3) Simplification of restoration procedures and establishment of a restoration fund

The first two policies are stringent measures to control illegal dumping. The third is for simplifying legal procedures to quickly restore adverse effects caused by illegal industrial waste dumping, and for establishing a fund to support local governments doing such a work.

### 2. Concept of the restoration system

Local governments, responsible for controlling illegal industrial waste dumping, have to find those who have committed illegal dumping and make them restore the environment to its original state. However, when the perpetrators are not caught or have financial difficulties, the restoration may not be carried out, leaving the living environment to deteriorate. In order to prevent such a situation, the fund was established to help the local

governments restore the deteriorated environment, and a part of the expense is granted from the fund. Naturally, the local governments must continue to investigate those who have committed the illegal dumping, and demand compensation from them. The Japan Industrial Waste Management Foundation was designated as the Proper Waste Disposal Promotion Center by the Minister of Health and Welfare to properly manage the fund. And because the fund will be provided only for the restoration of the waste illegally dumped after the Waste Management and Public Cleansing Law was amended, national subsidy was allocated in 1998 for the restoration of the waste illegally dumped before June 1997.

### 3. Outline of the fund

The fund was established as a social system for the whole country. Administration and industrial circles went fifty-fifty on the fund. The share of the expense for the administration side was equally divided between the central government and local governments. Every year, the Proper Waste Disposal Promotion Center incorporates grants from the central government and the industrial circles into the fund. When a local government places a request, the fund provides three quarters of the expenses.

The central government estimated, with prospects of effects by strengthening regulations, that the fund needs JPY 600 million every year. In 1998 when the fund was established, JPY 300 million was prepared during the first six months.

### 4. Status of the use of the fund

Although the fund had not been used for a while after it was established, the fund was appropriated for the restoration of illegally dumped sulfate pitch in Hyogo Prefecture in July 1999. This is the only case in which the fund was provided as of the end of August 1999.

### 5. Examples of restoration works

#### 1) Waste oil illegal dumping in Iwaki City in Fukushima Prefecture (Subject to 1998 national subsidy)

Since an industrial waste disposal company, which improperly stored a large amount of industrial waste comprised of drums of waste oil, waste acid and other hazardous waste, could not abide by an injunction to restore the site, the local government carried out the remediation of waste oil of about 50 thousand drums (the waste oil had already turned into sludge by this time) and built water treatment facilities on behalf of the disposal company in 1998. The total cost amounted to JPY 2.2 billion, and further restoration of drums in the ground, contaminated soil, and underground water is still needed.

## 2) Sulfate pitch illegal dumping in Shinoyama City in Hyogo Prefecture (Subject to the fund)

Thirty six drums of sulfate pitch were illegally dumped into the valley from the mountain road, and were scattered about. The perpetrator is unknown, but since the source of water lies in the lower reaches of the stream, the local government restored it. Upon request from the local government, the Proper Waste Disposal Promotion Center decided to provide JPY4.3 million, which is three quarters of total cost of approximately JPY 5.7 million for the restoration works.

(by Shuhei Kato)

### Dioxins Control Law is Newly Enacted in Japan

In Japan, dioxins have been one of the hottest topics in waste management. Since 1984, when dioxins were first found in fly ash of waste incinerators, various control measures were taken in waste management. Some of them were introduced in our previous issues (No.19, Jan. '97 and No.20, Apr. '97). Recently, citizens, particularly those living close to waste incinerators, are becoming more and more conscious about the effects of dioxins on health.

Accordingly, the Law for Special Measures for Dioxins Control was newly enacted on July 12, 1999 with the following objectives.

- Protection of public health by prevention and removal of environmental pollution caused by dioxins.
- Establishment of a new framework with regard to basic standards for relevant policies, necessary regulations, and countermeasures related to contaminated soil.

The outline of the law is as follows.

#### (1) Basic Standards for Relevant Policies

##### a. Tolerable daily intake (TDI)

For humans 4 picograms, or less, per 1 kg of body weight, stipulated by an ordinance.

##### b. Environmental quality standards

Establishment of environmental quality standards for air pollution, for water pollution (including pollution of bottom sediment), and for soil contamination.

#### (2) Regulations on Gas Emission and Water Discharge

##### a. Specified facilities

Specified facilities, subject to regulations, are designated by an ordinance.

##### b. Effluent standards

Establishment of discharge standards related to gaseous emissions (atmosphere) and effluents (water quality)

##### c. Total mass emission control of gaseous substances

A Total Mass Reduction Plan is formulated, and Total Mass Emission Control Standards established for areas subject to total mass emission control of gaseous substances (designated by ordinance).

#### d. Report of the plan to establish specified facilities and order to modify the plan

When specified facilities are to be established, its plan needs to be reported to the prefectural governor, who will give an order to modify the proposed plan.

#### e. Limit of effluent and order for improvement

Effluent standards and total mass emission control standards need to be observed.

The order for improvement will be issued by the prefectural governor.

#### (3) Treatment of Fly Ash and Bottom Ash Related to Waste Incinerator

Concentration standards of dioxins in fly ash and in bottom ash when they are treated, and the operation and management standards of final disposal sites for waste, are established.

#### (4) Measures Related to Soil Contamination

The governor shall appoint areas where countermeasures need to be taken, among areas that do not meet environmental quality standards for soil, and formulate a countermeasure plan. Two laws, the Pollution Control Public Works Cost Allocation Law and the Law on Special Financial Arrangement by the Government for Public Pollution Control Projects, are applicable to the countermeasures for the removal of contaminated soil.

#### (5) National Plan

The prime minister formulates a plan which includes target reduction amount of effluent per business sector, its countermeasures, and waste reduction policy (that needs to be approved by the Conference on Environmental Pollution Control).

#### (6) Study on Actual Condition of Pollution, and Obligation of Measurement

- a. The prefectural governor shall monitor contamination of air, water quality (including sediment), and soil, and report to the State Minister for the Environment.
- b. The national government and the local government shall study pollution levels.
- c. Enterprises are obliged to measure gaseous emissions and effluents.

#### (7) Enforcement of the Law

The law shall be enforced from the date stipulated by ordinance which is issued within six months after the law is promulgated.

#### (8) Subjects That Need to be Studied

- Promotion of research on polybrominated dioxins
- Study on the effect of dioxins on health and its accumulation in food from a scientific perspective.

We will again feature the new Dioxins Control Law when various standards, such as the Environmental Quality Standards and the Emission Standards, are established to substantiate the new regulations.

(by Hiroki Hashizume)

## Incineration of Municipal Solid Waste in Japan (1)

Japan's lack of space and high population density has meant that incineration of Municipal Solid Waste (MSW) has played a central part of Municipal Solid Waste Management (MSWM) for a long time. Recently options for reducing the final disposal amount that do not rely on the incineration have been important, but incineration is still the main option.

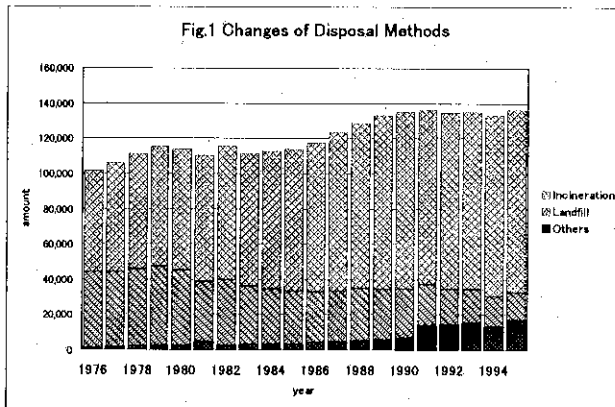
The incineration of MSW in Japan will be introduced in five series.

1. The status quo and the changes in the incineration of MSW in Japan
2. Change of legal regulations on incinerators and anti-pollution measures in Japan
3. Change of incineration technology and waste heat utilization in Japan
4. Management body and subsidy system of MSW incinerators
5. Problems and future of incineration

<No. 1: The status quo and the changes in the incineration of MSW in Japan>

### 1. Disposal methods of MSW

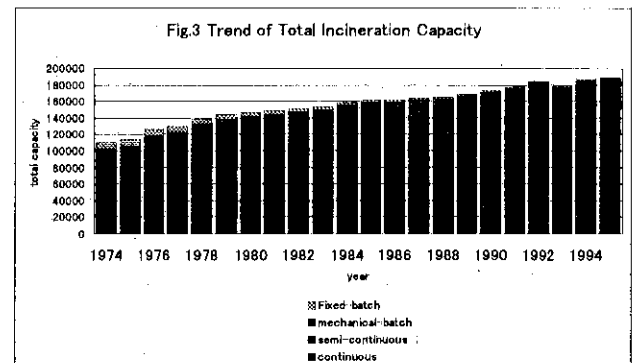
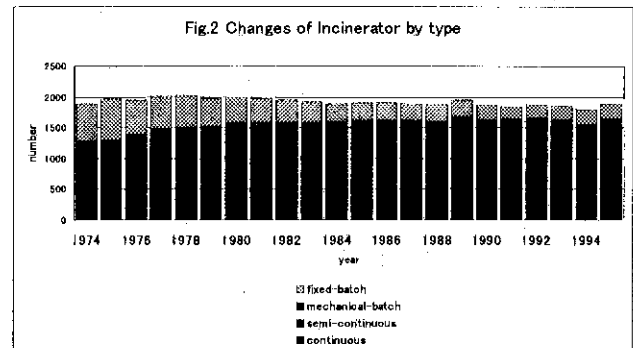
Changes in MSW disposal methods from 1976 to 1995 in Japan, categorized into incineration, landfilling, and others, are shown in Figure 1. Incineration continuously increased until 1990, reaching its peak. Changes in landfilling decreased, unlike incineration, while others have rapidly increased since 1990 due to diversification of waste disposal methods including resource recovery.



### 2. Change in incinerators

Figure 2 shows the change in the number of incinerators, based on type, from 1974 to 1995. Continuous type incinerators operate for 24 hours a day, and are large scale. Semi-continuous type incinerators operate continuously for 16 hours a day, and are medium scale. Mechanical batch type incinerators have mechanized furnaces that operate for 8 hours, and are small scale. Fixed grate batch type incinerators have fixed bed furnaces that operate for 8 hours, and are small scale.

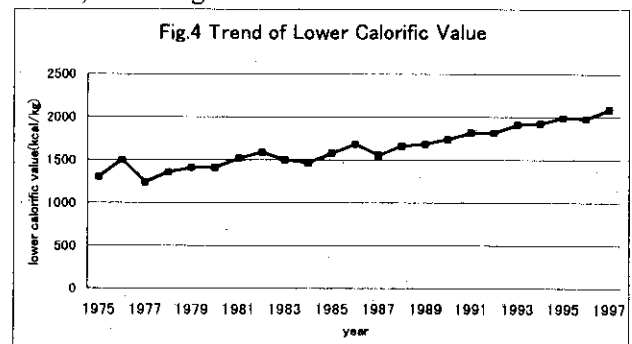
The number of incinerators has varied between 1,800 and 2,000, but the number has progressively dwindled. This is because the number of batch type incinerators has declined and the number of larger incinerators such as the continuous type and the semi-continuous type has increased. But the number of mechanical batch type incinerators is still the largest. The semi-continuous type incinerators had remarkably increased until 1995, but the continuous type incinerators has now overtaken them to be the most common type. Figure 3 shows total capacities of each type. Although the number of continuous type incinerators is the smallest, its total capacity is the largest. On the contrary, the number of batch type incinerators is large, but the total capacity is small.



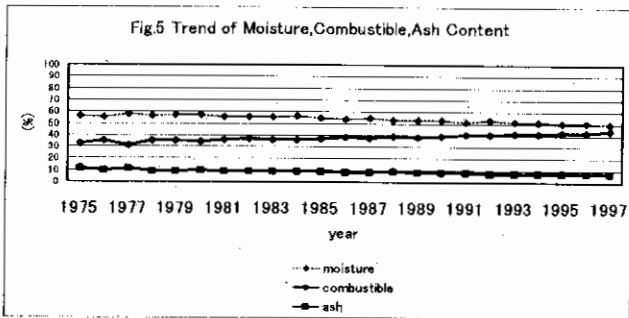
### 3. Composition of combustible waste

According to the composition analysis of combustible waste disposed of in MSW incinerators (using more than 300 samples every year), carried out by the Japan Environmental Sanitation Center, the changes in waste composition from 1975 to 1997 are as follows:

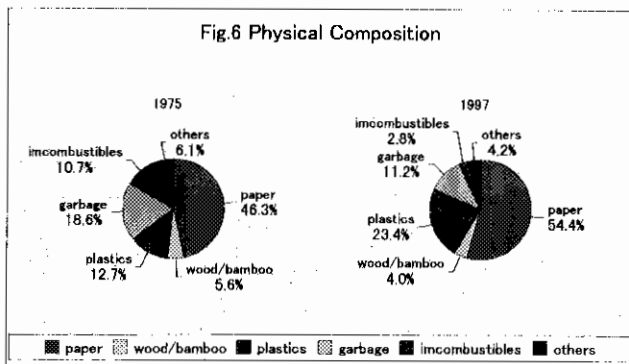
- 1) Figure 4 shows the changes in lower calorific value. It was 1,300kcal/kg in 1975, but reached 2,090kcal/kg in 1997.



- 2) Figure 5 shows the changes in moisture, volatile solids, and ash contents. Moisture content in 1975 was 56.0%, which decreased to 49.5 % in 1997, and volatile solid content grew. This led to an increase in the lower calorific value.



- 3) Changes in waste composition is shown in Figure 6. The composition has become more suitable for incineration. Major components in 1975 were paper and textiles (46.3%), food waste (18.6%) and plastics (12.7%). In 1997, the components of paper and textiles, plastic and food waste were 54.4%, 23.4%, and 11.2% respectively. Paper and textiles and plastic increased, and food waste decreased.



(by Takashi Miyagawa & Hideo Azuma)

### Preparation of Home Page of JSWME

The internet is now an indispensable medium for information exchange. In Japan, it is becoming popular not only among citizens, but also researchers in universities, research institutes, and private companies. To follow this trend, the Japan Society of Waste Management Experts is preparing its own home page to: 1) disseminate information on solid waste management among the members of the JSWME and the general public; 2) provide a forum in which the JSWME and its members can exchange information smoothly; and 3) promote public awareness so that JSWME members should increase. To achieve these objectives, the JSWME operates a "pilot" home page that contains mainly information for its members. The URLs are: <http://hzmec.ce.muroran-it.ac.jp/Gomigomi/index-e.html> (English version) and <http://hzmec.ce.muroran-it.ac.jp/Gomigomi/index.shtml> (Japanese version).

The site is still under construction, and may change in the near future. As soon as we have a permanent URL, announcements will be made in the home pages.

Currently, the English home page contains only information (activities, members, and back issues of the Newsletters). However, the JSWME is planning to include more information on the status of solid waste management in Japan and to enhance information exchange among members living in Japan and overseas.

The JSWME welcomes suggestions from readers of its English Newsletters concerning the home page. Your inputs will make the JSWME home page a more fruitful one. Please send your messages to: [hpiken@hzmec.ce.muroran-it.ac.jp](mailto:hpiken@hzmec.ce.muroran-it.ac.jp)

(by Hideki Yoshida)

### Journal of the Japan Society of Waste Management Experts, Vol. 10, No. 4 (July 1999)

A recent issue of the Journal of JSWME contains the following articles. The articles are written in Japanese, but the abstract is in English.

#### Paper

#### *Factors Affecting the Stabilization of Heavy Metals in Air Pollution Control Residue from Municipal Solid Waste Incinerators Using Chelating Agents*

Hirofumi Sakanakura, Kazutoshi Kanno, Takayuki Matsuo, Toshihiko Matsuo and Nobutoshi Tanaka

#### *A Study on Treatments of Waste Fire Retardant Plastics —A Comparison of the Gas-fired Incineration Method and Wet Oxidation-method—*

Yasushi Oka, Kunihiro Takagi, Takashi Uchida, Masahide Wakakura, Fumio Adachi and Terushige Ogawa

#### *Study on the Effective Utilization of Waste Stillage from Sweet Potato-Shochu Distillery —Making of Reborn Paper and its Physical and Mechanical Properties—*

Masahito Yamauchi, Tokio Hirata, Yasushi Matsufuji, Yuji Maeno, Megumi Mihara and Kenjiro Yoneyama

#### *A Study on the Solubility of PCDDs/DFs when in Coexistence with Dissolved Humic Matter*

Yong-Jin Kim, Masahiro Ohsako and Dong-Hoon Lee

#### *An Experimental Study in Reducing the Water Content of Compost in Household Composting Containers*

Katsuhiko Yamamoto, Masaru Toyoda, Shin-iti Misawa, Takamitsu Konno and Masanori Nonaka

#### *A Comprehensive Evaluation of Variable Rate Pricing Policy for Solid Waste Management*

Katsuya Oshima and Yasoi Yasuda

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