JSWME

NEWSLETTER

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THE JAPAN SOCIETY OF WASTE MANAGEMENT EXPERTS

Dear Waste Management Experts

On June 16, the Packaging Recycling Law was promulgated. This issue of JSWME's NEWSLETTER gives you an outline of the law, whose impact on daily life, the economy and the environment in Japan will be so large that, the editor believes, the law should be one of 1995's 10 major news stories. However, up to now it does not seem to have attracted very much attention due to the social confusion of the Great Hanshin-Awaji Earthquake, the sarin gas attacks and the rapid fluctuations of the Japanese yen.

Also in this issue we will feature news of the Great Hanshin-Awaji Earthquake. Earthquakes and waste management is a hot topic these days. JSWME is dealing with the issue, too. On June 12-13, an Earthquake Waste Symposium was held under the joint auspices of JSWME, Japan Waste Management Consultants Association, UNEP and ISWA. This year's annual JSWME conference being held in Kobe October 16-18 will also have a special session on earthquake and waste management.

(by Hiroki Hashizume)

A New Law for Packaging Recycling Enacted in Japan

Japan has been struggling to deal with its huge amount of waste. In fiscal '92 (April '92 to March '93) 50.2 million tons of municipal solid waste (MSW) was discharged. Of that, 30.5% (15,300 thousand tons) was landfilled after crushing, incineration, etc. Japan, with a very small land area, has difficulty finding suitable new landfill sites and as of March 31 '93, remaining landfill capacity for MSW was 8.2 years. On the other hand, recycling of MSW is increasing but still quite sluggish. While some 40% of industrial waste is recycled, recycling of MSW remains at 3.9% as of fiscal '92.

The best way to solve the problem is, no doubt, to minimize the generation of waste by promoting the recycling of waste over burning or landfilling. A hint came from Germany and France; recycling of packaging waste (PW). Recycling of PW such as glass, metal, paper and plastics is technically feasible and could effectively reduce waste generation because in Japan, PW accounts for 60% by volume and 30% by weight of MSW.

The law for Promotion of Separate Collection and Recycling of Containers and Packages ("Packaging Recycling Law") promulgated on June 16, '95, targets every kind of container or package which is used for commercial goods. The law is based on the philosophy of sharing responsibility for managing packaging waste among consumers, municipalities and industry.

Consumers shall discharge PW material by material and separate from other waste; municipalities shall collect PW separately; and industry shall recycle the collected PW, e.g. to make cullet out of waste glass bottles and to liquefy waste plastics. In order to promote comprehensive and systematic recycling, competent ministers shall establish a "PW Separate Collection and Recycling Principle" and prepare a "PW Recycling Plan". In accordance with the Principle and the Plan, a municipality shall prepare a "PW Separate Collection Plan". Both plans shall be made as five year plans every three years. A municipality also shall establish standards of separate discharge of PW for citizens, etc.

Enterprises which have attached packaging to their commercial goods, and those which manufacture containers are obliged to recycle their PW according to their use and production of the packaging. Recycling of containers is shared between the using industry and the container producing industry according to their sales. Importing enterprises are subject to the same regulations. Manufacturers of materials for packaging are not required to recycle PW, but are required to utilize recycled materials.

There are two ways for industry to fulfill their recycling obligation. First, an enterprise can make a contract with an agency designated by competent ministers and pay a fee for recycling to the agency. Second, an enterprise can recycle PW which is related to its use and production for itself or entrusting it to recycling companies other than the designated agency. In this case, the enterprise has to get authorization from the competent ministers as to the feasibility of its system. Further, returnable containers with high rates of return, such as beer bottles, are exempted from the recycling requirements of the new law. By so doing, use of returnable packaging is encouraged.

Industry's yearly cost for recycling is estimated at ¥110 billion ($1.2 billion) when 30% of each kind of PW is separately collected by municipalities. For example, the cost of recycling a clear glass bottle (300 mℓ, 200 g) is estimated at ¥0.11; a paper box (20 g) at ¥0.06; a PET bottle (1.5 ℓ, 65 g) at ¥1.4.

It is epoch-making that industry's responsibility and burden are explicitly introduced to the recycling of PW is MSW management. So far, waste management has not been fully taken into account during production, marketing, etc. The new system economically internalizes waste recycling cost, and gives incentives to produce long lasting and easy-to-recycle products. The life style of citizens also will be influenced. Plastic shopping bags now given free at super-markets may be charged for, and people may carry their own shopping bags again. Municipalities will be affected by the increased cost of introducing separate collection of PW. However, the cost is expected to be offset by likely long term cuts in expenditures for costly incineration plants and landfill sites. Thus it is strongly expected that everybody - citizens, municipalities and industry - positively participate in the new system. And by so doing, a "recycling oriented society" or "zero waste society" should be achieved.

(by Hiroki Hashizume)

Management of Earthquake Waste Generated by Hanshin Area and Awajisima Island

Huge Earthquake Waste Generation and Utilization

A major earthquake struck at 5:46 am on January 17, 1995 affecting Awajishima, Kobe, Ashiya, Takarazuka and surrounding cities, collapsing old wooden houses and buildings, shutting down city functions and leaving over 5,000 people dead. The earthquake generated 18.5 million tons of wastes. This is the amount of the waste that a city of 10 million people generates over 3 years. Of the 18.5 million tons of waste, 15 million tons are incombustible and the remaining 3.5 million tons are combustible. The Hyogo Prefecture Government estimated that it would be possible to recycle 11.5 million tons of the earthquake waste, 62% of the total amount.

At Hokudan Village, Awaji Island

Table 1. Hanshin and Awajishima Island
Amount of Earthquake Waste and Recycling Plan
Unit: 1,000 tons

Amount	Usage of Recycled Waste	
1. Incombustible Waste		
15,000	A. from Concrete Waste	
	a. For Housing and Buildings	
	1. Sea Reclamation	6,390
	2. Building Materials	190
	Subtotal (1+2)	6,580
	b. For Public Facilities	
	1. For Sea Reclamation	3,820
	2. For Building Materials	620
	Subtotal (1+2)	4,440
	B. from Metal Waste (used as raw steal material)	
	a. Houses and Buildings	280
	b. Public Facilities	180
	Subtotal (1+2)	460
	Total (A + B)	11,540
2. Combustible Waste		
3,500	Wood Waste For Housing and Buildings (used as pulp material, fuel, and fertilizer after being processed into chips)	80
3. Total (1+2) 18,500		11,560 (62% of generated amount)

Note: Non-recycled incombustible waste will be disposed of at a disposal site in Osaka bay. Non-recycled combustible waste will be incinerated and then hauled to final disposal sites.

Earthquake Waste Management Policy

The Hyogo Prefecture Government has set the following policy regarding management of the earthquake waste:

1. Waste from public facilities will be disposed of in line with urban (re)development plans.
2. Waste from houses and buildings will be disposed of in accordance with a "Disaster Waste Management Plan" prepared by each municipality. This plan, effective in April, 1995, must show the monthly amount of waste generation in each district and destinations of haulage in each district.
3. Building waste should be removed in order based on the degree of emergency and public benefits. Dismantling and removal of the waste from the disaster areas is to be completed by March, 1996. Pulverization, incineration, and landfilling is planned to be completed by March. 1997.

Problems with Management of the Earthquake Waste

Major waste problems experienced in the affected areas are as follows:

1. The solid waste from damaged houses and roadwork contains ordinary municipal and earthquake waste, which comprises concrete debris, propane gas, and kerosene. This mixture cannot be managed with the regular system.

2. The waste disposal plants in the disaster area had relatively minor damage with some exceptions, and those facilities took several days to several weeks to be repaired; however, because of the delays in restoration of water, electricity, and gas and wrecked roads, auxiliary firing fuel could not be delivered, which resulted in every kind of solid waste being dumped in the street, disturbing waste haulage.
3. Since crowded Kobe city doesn't have enough public space (sports parks, community parks or forests) in its downtown area, earthquake waste was dumped in the street and on vacant sites, causing delays in waste disposal.
4. An Intermunicipal and integrated waste management system needs to be established to effectively cope with an emergency situation.
5. Environmental Risks; Some citizens are afraid that the open burning of earthquake waste would lead to the generation of dioxin and that demolition of buildings would generate flying asbestos, both of which are harmful to people. Subsequently, municipalities stopped the open burning of waste and sprayed water when demolishing buildings.
6. Slow provision of toilets and difficulties in human waste management; Since a centralized sewage system covering a large area is vulnerable to earthquakes, small, local sewage treatment facilities, including Johkaso, would be alternative to survive an earthquake.

A big reason that the earthquake caused great human loss and property damage is that the cities did not prepare themselves for an earthquake. They had not experienced a serious earthquake for many years. Appropriate disaster prevention measures, i.e., mental, physical and administrative preparedness could minimize damage and loss due to earthquakes.
(Hisayuki Futami, Kiichiro Sakaguchi and Koji Hirayama)

We need to refocus the volunteer spirit on environmental activities.

By Courtesy of Prof. Hiroshi Takatsuki, Kyoto Univ.

Introduction of Universities with Programs Related to Waste Management in Japan (3)

Chair of Environmental System Engineering, Kyoto University

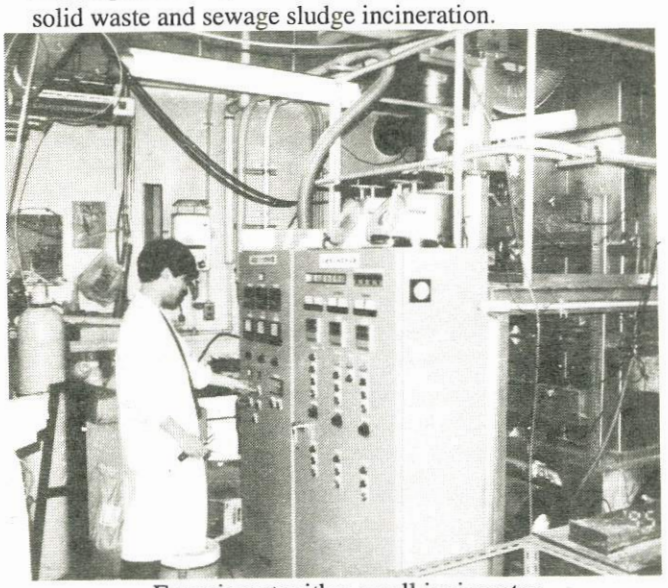
To solve various public health problems using modern technologies is the most important role of "Environmental and Sanitary Engineering". Kyoto Univ.'s Chair of Environmental Systems Engineering began research and development in solid waste management around 1968. They found the most reliable technology for solid waste treatment is thermal treatment, by which degradable materials, hazardous substances, and infectious wastes are decomposed. However, thermal treatment itself sometimes discharges pollutants. Municipal solid waste incineration, for instance, discharges particulate, sulfur oxides, hydrogen chloride, nitrogen oxides, dioxins, heavy metals, etc. The chair is currently researching and developing solid waste management systems using thermal treatment processes. The pyrolysis and incineration of combustible solid waste as well as municipal solid waste and sewage sludge are being examined with the goal of minimizing environmental impact. In addition, a design procedure and energy and cost estimation system are being developed for solid waste treatment systems.

Today, conventional pollution problems due to particulate and acidic gases have nearly been solved. Mass flow of chlorides in municipal solid waste incineration systems has been clarified and technology for the reduction of hydrogen chloride in flue gas has been established. The reductive two-step incineration technique for preventing nitrogen oxides is widely applied to not only municipal solid waste incinerators, but sewage sludge incinerators. A co-disposal system of municipal solid waste and sewage sludge was developed and is being used in commercial plants. Highly efficient anaerobic digestion of sewage sludge with thermal pretreatment was established. A drying-incineration system for sewage sludge treatment has been applied to large and small scale sludge treatment plants. A system for melting sewage sludge has been studied and now many commercial plants are in operation.

Control of micro-pollutants like dioxins and heavy metals and resource recovery from solid wastes are becoming more and more important. Combustion control and improvement of flue gas cleaning systems reduces the emission of such micro-pollutants, and energy and material recovery from solid wastes are now being put into practice.

The main projects of the chair currently are;
- Design of combustion chambers based on computational flow dynamics
- Development of a new air pollution control system for solid waste incinerators.
- Extraction and decomposition of chlorinated organic compounds in fly ash.

- Examination of analytical methods for chlorinated organic compounds.
- Recovery of heavy metals from fly ash.
- System analysis of MSW thermal recycling systems.
- Development of system for melting ash from municipal solid waste and sewage sludge incineration.



Experiment with a small incinerator

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The volumes contain the following technical papers. (written in Japanese with English abstract)

Vol. 6 No. 1 (January 1995)

A Study of Evaluating Disassembly of Home Appliances
by Hiroshi Onishi, Takahiko Terada and Tokihiko Shimizu

Effect of Raw Refuse Composition on the Fuel Properties of RDF from Household Wastes
by Youngjae Kim, Toshihiko Matsuto and Nobutoshi Tanaka

Dechlorination Treatment of Polyvinyl Chloride
by Heiji Enomoto, Atsushi Hatakeyama and Yoshishige Kato

Simulation Modelling of a Sludge Melting Furnace with Dried Sewage Sludge Injection
by Jia-bing Wang, Takeshi Tsunemi, Takashi Fujii and Muneharu Ichikawa

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Quantity and Quality Changes of the Leachate from a Bed packed with Incinerated Ash from Municipal Solid Waste under Real Meteorological Conditions -Results of Outdoor Column Experiments and Evaluation of Water Quantity and Quality with Model-
by Ken Kanaya and Yutaka Terashima

Leaching of Organic Substance from a Sea-based Solid Waste Disposal Site and its Disintegration Mechanism in the Lagoon
by Isao Fukunaga, Osamu Yamamoto and Zensuke Inoue

Utilization of Yeasts and Yeast Extract Originated from Food Industrial Wastewater Treatment Process
by Jun-ichi Yaguchi, Kaoru Chigusa, Yoshihisa Minegishi and Toshihisa Tamura

Preparation and Properties of Glass from Sewage Sludge Slag
by Kazumasa Matusita, Nobuki Shiragaki, Ryuji Sato, Takayuki Komatsu and Kiyoshi Momonoi

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Method for Producing High Adsorptive Activated Charcoal from Organic Sludge
by Kazuyoshi Matsunaga, Keijirou Morita, Motoichi Kondoh, Tsutomu Itatani, Tadashige Mori, Kouji Shishido and Motohiro Ohbu

Study of Environmental Conditions on Sulfate Reduction in Leachate from Incinerator Ash
by Kentaro Miyawaki, Nobutoshi Tanaka and Toshihiko Matsuto

Effect of High Salinity on Biodegradation Processes of Solid Wastes in Landfill Sites
by Ayako Tachifuji-Tanaka, Yasushi Matsufuji and Masataka Hanashima

Toxicity of Municipal Solid Waste Combustion Fly Ash to Daphnia
by Hidehiro Kaneko and Futoshi Ikeda

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