NEWSLETTER

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THE JAPAN SOCIETY OF WASTE MANAGEMENT EXPERTS

Dear Waste Management Experts

As we have often repeated, the recycling of waste, particularly, packaging waste is becoming the biggest waste management issue in Japan. In this issue of the NEWSLETTER, we will report on the status of waste recycling. In this connection, Kashiwa City's experience with the separate collection of plastic waste is also covered.

Our NEWSLETTER has occasionally been dealing with overseas cooperation in the field of waste management. Although Japanese technical cooperation been centered on household waste so far, the study in the Santiago in Chile recently completed by the Japan International cooperation Agency, included industrial solid waste (ISW) management. Because it seems that knowledge of ISW management in technical cooperation is fairly limited, we will show you the method of ISW generation forecasting which the study used.

(by Hiroki Hashizume and Noriko Hihara)

Current Situation of Waste Recycling in Japan
- after Enactment of the Packing Waste Recycling Law -

In Japan, the new Packaging Waste Recycling Law was enacted in June 1995 and its related ordinances were promulgated in December of the same year. This law will be put in force from 1997 to 2000, depending on the type of packaging. It will obligate people to discard packaging waste (PW) separately at source, municipalities to collect it , and industry to recycle it.

The law stipulates that it is municipalities' choice whether they will participate in the recycling system or not and if they do, what kinds of PW they will collect. A study by the Ministry of Health and Welfare has shown that about 65% of municipalities throughout Japan have already started separate collection of resources. This stands in marked contrast with the results of a 1993 study where the rate was only 42%. The current study also shows that almost 90%, including municipalities which are now studying their options, will collect PW.

The main items collected are aluminum, steel and glass. Therefore, a PW recycling system will soon be nationwide with few exceptions.

In Europe some countries have already put Packaging Ordinances in force. Germany has the famous "Green Dot System", which was created by industry itself due to the stipulation that industry must take responsibility for taking back and recycling their products. The French system is somewhat more moderate in that municipalities collect PW and the collected PW must be purchased by industry to compensate municipalities for collection of PW.

In Japan, however, the new law burdens municipalities with collection costs. This is a crucial point in terms of sharing responsibility for managing PW between consumers, municipalities and industry. For example, some supermarkets have their own collection systems in their shops but the new law, which stipulates that municipalities are responsible for collecting PW, would discourage these efforts.

Furthermore, household waste is collected free of charge in most municipalities in Japan and the expenses are paid through the general tax fund. Although the introduction of waste disposal fees is believed to be an economic incentive for waste reduction and the Ministry of Health and Welfare and the Ministry of International Trade and Industry respectively suggested in their reports in 1994 that municipalities charge waste disposal fees, it is still controversial among municipalities. Therefore, the separate collection cost of PW will also be paid through the general tax fund, which could affect municipalities financially.

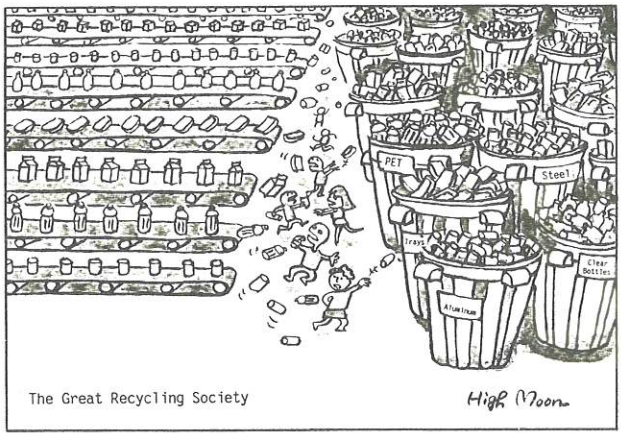
Another important concern is if the law will actually contribute to waste reduction, the highest priority in waste management. For instance, both the German Packaging Ordinance and the Austrian Packaging Ordinance stipulate a lower limit for the ratio of returnable containers for beverages to one-way containers in order not to let the number of one-way containers overwhelm the number of returnable containers. In Japan, although one-way containers have shown a steep increase in the packaging market, there is no specific reference to encouragement of returnable containers in the new law.

From a technical point of view, plastic is the most troublesome kind of packaging. The reason being that many kinds of plastic are mixed together when collected and plastic containers have contamination such as food residues, metals and so forth. How to recycle plastic should be focused on. Of course, the development of

markets for secondary resources should be emphasized. Otherwise, collected resources will have to go to landfill sites and the recycling system will be in vain.

There are still several problems to be solved by the time the recycling system is completely established in Japan. The Packaging Waste Recycling Law is expected to be a prominent step toward the creation of a recycling oriented society and it should be succeeded by the next step.

(by Ryoko Sugiyama)



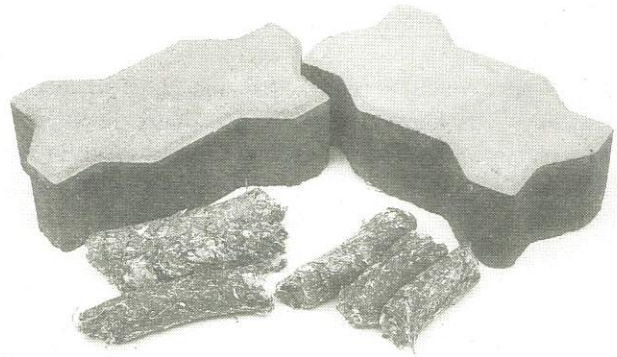
By Courtesy of Prof. Hiroshi Takatsuki

Japanese Municipalities on the Move (8)
- Separate Collection of Plastic Waste in Kashiwa City, Chiba Prefecture -

Background In April 1995, Kashiwa City, one of Tokyo's bed towns, one hour northeast by train, with a population of 318,000, started to collect waste plastic separately from other kinds of household waste.

Until April 1991, when the present incineration plant started to operate, waste plastics were treated as incombustible waste and landfilled. When the new incinerator was built, plastic waste was to be burned in order to extend the life of the landfill site. However, in the middle '80s, waste generation was expanding so rapidly that the plant was forced to cope with waste beyond its capacity from the first day of its operation. Therefore, in order to solve the over-load problem, various waste minimization programs were begun. Waste newspaper and magazine collection began in '82, a composting promotion program was started in fiscal '90, and in '92, collection systems were started for paper packaging, waste boxes, receipt paper and wrapping paper. What was left was plastic waste which has a high calorific value and is quite voluminous.

Present Situation All plastics except those used for electrical appliances, are subject to separate collection after a cursory cleaning at each household. Every Wednesday, plastic waste is collected and transported to a privately operated storage facility by the city. Then the plastic is recycled as interlocking blocks and solid fuel by private companies, one located inside and the other outside of Chiba Prefecture. Recycling is carried out by private enterprises because of time and site limitations that prevent plant construction in the city.



Recycling Interlocking Brocks (upper), RDF (lower)

The amount of waste plastic collected from April '95 to the end of the year was about 5,500 tons, or 63 grams per day per capita. Although This has increased waste management costs, it also has enabled the incinerator to operate within its specifications and reduced the overall amount of waste.

Future Direction The plastic recycling method which the city now relies on does not recognize the unique characteristics of plastics. They are all mixed together. Recently, recycling technologies such as liquefaction and solidification to fuel has been developed and put into practice by the national government and private companies. There is also demand for PET bottles as product material. Thus, Kashiwa City is planning to collect PET bottles separately from other plastics for the purpose of material recycling. The city is also thinking of ways to recycle other kinds of plastics using thermal recycling or chemical recycling. The city plans to be a leader in plastics recycling in Japan and wishes to help realize a zero waste disposal society.

(by Katsuhiko Chiba)

Forecast of Industrial Solid Waste Generation
- from JICA Development Study in Chile -

The Japan International Cooperation Agency (JICA) conducted "**The Master Plan Study on Industrial Solid Waste Management in the Santiago Metropolitan Region (SMR) in Chile"** from January 1995. Among the various issues covered in the study we would like to discuss the method by which industrial solid waste (ISW) was covered in the Study.

In order to plan and establish a proper Solid Waste Management (SWM) system, "identification of present SW generation" and "estimation of future SW generation" are indispensable. However, there are intrinsic difficulties related with ISW, i.e. (i.) extreme variety in the kind of industries generating ISW, (ii.) wide diversity of types of ISW generated and (iii.) non-existence of unified ISW classification. In a previous study conducted by the Chilean side, the ISW generation amounts for the year 1992 were estimated by using the INVENT and WHO models. There was quite a large difference between the total amount of ISW estimated by the INVENT model and by the WHO model; i.e. 7,911,000 ton/year and 344,000 ton/year respectively.

At the beginning of the JICA Study, the Study Team decided to follow the 333 ISW classifications being applied in the manifest system for ISW. This was an advantage in that both waste generators and the authorities could identify ISW. However, the diversity of this classification is a great disadvantage and imposes heavy restraints when estimating total waste generation amounts and when making treatment/disposal plans based upon the estimated value. Consequently, the Team proposed a 24 items ISW classification scheme to be used for the Study that is compatible with and is a calibrated version of the 333 classification.

Estimation of present ISW generation is carried out by referring to the outcome of the Team's factory survey plus data from the previous study which is converted to the 24 waste classifications scheme proposed by the Team. Based on data from 425 factories, generation ratios of 24 ISW classifications were calculated. The amount of ISW is calculated by multiplying the ratio by the present number of employees for each industry category. As a result, the Team's Study verified that ISW generation in the SMR at present (1995) is on the order of 939,000 ton/year, which is comprised of 26,000 ton/year of hazardous waste (HW), 45,000 ton/year of liquid waste (LW) and the rest being non-HW according to the ISW classification being applied in the manifest system. HW and LW, which are subjected to the closest scrutiny and control in view of ISWM, count for only 7.6% of total ISW. In other words, the great majority of ISW is non-HW at present.

Based on the estimated amount of present ISW generation, a forecast of future ISW generation in 2010 was conducted by applying the Standard Unit Method . Based upon data obtained from the Team's factory survey and the previous study (except for sludge and dust) ISW generation in the year 2010 was calculated as the product of the "generation ratio in 1995" and the "forecasted employee number in 2010" for 36 respective industry classifications. The forecast for sludge and dust generation, on the other hand, was conducted assuming the present installation rate of Pollution Control Facilities (PCF) (2.1 % for air PCF and 48.9 % for on-site water PCF) would reach 100 % by 2010.

The generation of ISW is highly dependant on the assumed water content of sludge. ISW generation in 2010 is forecasted both for cases without dehydration at generation sources and those with dehydration on-site. As in the case of facilities without dehydration on-site, the water content of inorganic sludge and organic sludge is assumed to be 90 % and 99 % respectively. The estimated amount of total ISW generation in the year 2010 is 8.5 times more than that in 1995 or 8.00 million ton/year. "Organic sludge" generation in 2010 is forecasted to be 6.59 million ton/year, which accounts for 82 % of the value estimated above.

In the case of facilities with dehydration on-site, the estimated amount of total ISW (after on-site dehydration) in 2010 is only 22 % of the above estimation, which is 1.9 times the 1995 rate or 1.76 million ton/year. In this case, organic sludge accounts for only 25 % of the total generation. However, the estimated increase in dust and sludge (which should be subject to control as HW) from 1995 to 2010 is remarkable. It is estimated that by 2010 it will be 687,000 ton/year and will account for 39% of total ISW generation. Consequently it is forecast that ISW generation in the SMR in the future will be quite different from that of today both in quantity and quality.

(by Susumu Shimura)

Open Burning of Discarded Drums in SMR

Introduction of Universities with Programs Related to Waste Management in Japan (6)

- Lab. of Environmental Policy, Graduate School of Nutritional and Environmental Sciences, Univ. of Shizuoka -

The Laboratory of Environmental Policy belongs to the Department of Environmental Health Sciences in the Graduate School of Nutritional and Environmental Sciences. The Graduate School was established with the purpose of integrating food, nutritional and environmental sciences and focusing on developing a comprehensive study and research program on the

improvement and maintenance of health and the creation of a better environment. The Department is striving to develop expert researchers and planners who can appropriately cope with social issues related to health and the environment into the 21st century. The master's course was opened in April 1991 and the doctor's course was opened in April 1995. Utilizing top notch technology and information, the Department is tackling many of the environmental problems which are getting more complex and diversified year by year on both an individual scale and a global scale. The Department consists of the Division of Chemical Sciences and the Division of Ecological and Health Sciences.

Professor Isamu Yokota (Ph D., Engineering) and Lecturer Yoshitaka Nitta (Ph D., Pharmacology) lead the Laboratory of Environmental Policy. The Laboratory has one doctor's course student and 6 master's course students as of April '96. Prof. Yokota specializes in waste management, environmental impact assessment, environmental engineering policy analysis and international development using a mathematical science approach. He has 20 years of administrative experience at the Ministry of Health and Welfare and the Environment Agency. Lecturer Nitta is a specialist in waste management and recycling policy analysis utilizing multi-variant analysis. Currently, the laboratory is targeting municipal waste management policy due to the introduction of the Packaging Waste Recycling Law; the present situation and future direction of environmental education; methodology of environmental auditing for nationwide retail stores; and analysis of Chinese environmental management policy.

Shizuoka Pref. and Mt. Fuji form LANDSAT 5 (Processed by Remote Sensing Group of Univ. of Shizuoka)

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Vol.7 No.1 (Jan.'96) & Vol.7 No.2 (Mar.'96)

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

Vol.7, No.1 (Jan.'96)

Characteristics of Solid-liquid Separation of Waste Excess Sludge from Small-scale On-site Domestic Wastewater Treatment Systems
by Takehiko Ogawa, Masaharu Tadokoro and Shigeru Ohno

Risk Reduction of Municipal Solid Waste Management Systems After Severe Disaster
by Shinsuke Morisawa, Sayoko Tanaka and Yoriteru Inoue

Melting Test for Fly Ash form a Municipal Waste Incineration by Electric Melting Furnace
by Moriya Suzuki

Various Factors of Leaching for Detoxification Treatment of Fly Ash from Waste Incineration Plant
by Isao Fukunaga, Hisao Itoh and Minoru Sawachi

The Emission Behaviors of Nitrous Oxide Caused by Municipal Solid Waste Incineration
by Kenji Yasuda and Michimasa Takahashi

Vol.7, No.2 (Mar.'96)

Quantitative Evaluation Method of Recycling and Application to the Automobile Bumper Recycling
by Yasuhiko Wada, Hiroyuki Miura and Kazuko Nakano

Analysis and Estimation of the Consumption of Goods Related to Waste Generation
by Tomoya Omori and Yutaka Terashima

Energy, Cost and Environmental Impacts Analysis of Five RDF Production Facilities
by Toshihiko Matsuto, Nobutoshi Tanaka and Youngjae Kim

Experimental Studies on the Removal of Metal Mercury from Flue Gas Using Fly Ash
by Takashi Nishitani, Isao Fukunaga, Hisao Itoh and Tomohiro Nomura

Recycling of Molding Resin Residues Generated from the Printed Wiring Boards Production Process
by Masatoshi Iji and Sadahiko Yokoyama

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