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NEWSLETTER

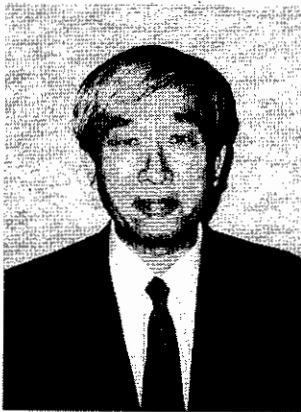
No.31

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January 2000

THE JAPAN SOCIETY OF WASTE MANAGEMENT EXPERTS

**Let's Build a Social System of Synergetic Roles
- New Year Greetings -
JSWME President, Katsumi Yorimoto**



As you know the tenth anniversary of the founding of the Japan Society of Waste Management Experts (JSWME) is approaching (March 2000), and I would like to extend my warmest appreciation to all those who have been supporting and understanding the activities of the JSWME.

Now at the start of the 2000s, we are beginning an exciting, new era, but the future is uncertain. It could be one of the hardest moments throughout history for humanity from an environmental view. Problems related to the environment, the finite resources, and the demographic changes will intensify, and may even endanger human subsistence.

On the waste and resource management point of view, the world population exceeded 6 billion last year, and is still on the increase. Rapid population increase cancels per capita waste reduction and resource save. In addition, population increase is going on mostly in developing countries, and although at present waste generation and resource consumption in the industrialized countries outweigh those by developing countries, in the future people in developing countries will have consumed more and produced more waste. Thus, the global situation of waste and resources may deteriorate regardless of the enthusiastic efforts of the many people who are trying to reduce waste and to recycle resources.

As such it is hard to say the new century will be very bright, and, if anything, it will be more difficult to sustain both our present environmental conditions, and human subsistence. Yet it is neither the time for finger pointing, nor apathy and disenchantment, but a time for individuals to unite, light a torch, and illuminate the dark abyss. Jonathon Porritt, a leader of the "green movement" in Britain, points out in his book the following that people can do to save the world.

1. Reduce population growth as much as possible
2. Reduce energy consumption. Limit consumption of finite natural resources to within a regeneration range.
3. Refrain from buying products that are harmful to the environment and to live considering environmental protection.
4. Introduce cuts to the military budget, and to divert funding for the rehabilitation of rain forests and disparities related to the north-south problem.
5. Introduce a new taxation system, such as progressive taxation imposed on energy consumption.
6. Reflect public opinion on environmental protection in the legislature. Public agendas should be raised to a political agenda.

(Excerpt from "Where on Earth Are We Going?")

Many people and organizations have recently suggested these types of measures and action programs:

I believe that a "Social System of Synergetic Roles" should be built. "Synergetic Roles" is a phrase I made, meaning the roles of citizens (including NPOs and NGOs), enterprises, and governments (including local governments and various public bodies) related with each problem should be combined (or multiplied) appropriately to tackle public problems (or social problems). As a result, a large synergetic effect shall be achieved. If the roles of related bodies are combined appropriately, even though there are fewer resources and man power, it is possible to achieve a larger effect. The following structures can be considered as an example. Retail shops should cooperate by collecting and by trading used goods. Manufacturers should collect these items from the retailers and reuse them for production. Further, the government should support the private sectors and take measures, such as tax reform, to assist in recycling by the private sector. The relevant bodies are creating some synergetic effects under the existing law and policies, but there is still room for improvement. Furthermore, there are many issues to be tackled by a new structure to support a synergetic system through law and policies.

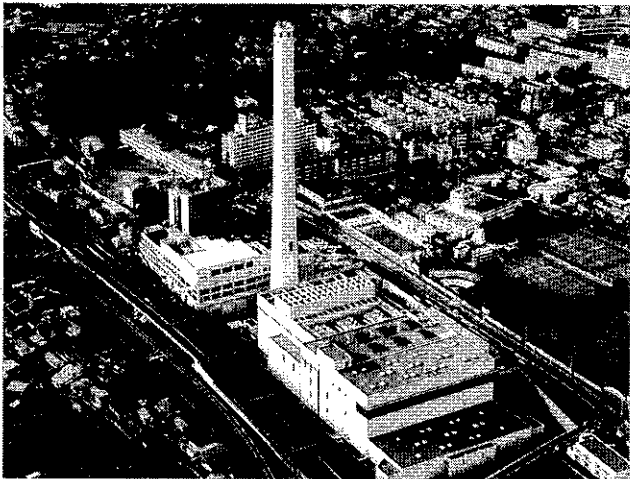
We now have to combat waste and environmental problems even more seriously, and I believe that the basic direction to take is to build a "Social System of Synergetic Effect" for each public problem. The Japan Society of Waste Management Experts is expected by the public to play a positive role to build this system.

**Japanese Municipalities on the Move (13)
Tokyo's Incineration Plants Receive ISO 14001
Certificates: Through Diligence and Wisdom**

The Adachi and the Ooi incineration plants, operated by the Tokyo Metropolitan Government's Bureau of Waste Management (BWM), received an ISO 14001 certificate in October, 1999. In addition to the Sugunami and the Katsushika incineration plants (approved in June) and the Meguro incineration plant, (approved in September), there are now five incineration plants under the Tokyo Metropolitan Government that have been designated as ISO compliant this fiscal year.

It has been over a year and a half since the BWM declared its intention to increase the number of plants with ISO certificates, and in this article we would like to introduce the experiences that we have gained up to now.

With the ISO compliance process, it is common for industries to hire consultant firms, but because the BWM wished to pursue its policy of using in-house staff to prepare its registration processes, we organized a special project team at each of the plants to prepare the management manuals. However, once the process of developing an integrated Environmental Management System began, we had very little guides and sample manuals on how the ISO 14001 standards should apply to the Environmental Management Manuals (EMM) at waste incineration plants. Therefore, members of the project team held monthly meetings in order to actively exchange and discuss all the information obtained. The common topics discussed during these meetings centered around the lack of concrete materials available, and the abstract nature of the information available with which to refer.



Sugunami Incineration Plant (600t/d)

At first we began to gradually make the EMM and checked the results against the ISO 14001 requirements, but it was difficult to take the next step. Therefore in order for the project team to gain a clear vision of the final product, we conducted several study tours of industrial waste treatment facilities, private treatment plants, and interviews to the relevant personnel at these facilities.

When we encountered difficulties on how to objectively assess the environmental impact posed by the waste treatment plant, we held numerous meetings to solve this problem. We could not, however, reach a solution to what assessment method should be applied during these meetings.

Through a series of trial and error, we were able to build an Environmental Management System and prepared the EMM. We applied this system for 3 months at each plant, and found that these manuals, although carefully planned, were still far from complete. The manuals were frequently refined throughout the three month period. Further, we organized an internal audit support team, consisting of staff from the plant control department, and conducted an internal audit before there was an official external audit.

When the new system was under way, there was an external audit by a certification/registration body. During the audit when the external auditors examined relevant records and data, and asked questions to the project teams, we often had heated disputes, because their questions from an ISO view often upset us. One of examples was the auditors stressed that the importance of the ISO policy is to identify and address causes for non-compliance of standard, criteria or goal of any kind, rather than simply pointing out figures as fact of failure, which sometimes upset us. Discussions during the audits regarding performance quality and operational management to reduce the impact on the environment, however, have been fruitful. Environmental Management Systems at all the plants have significantly improved through these audit processes.

The response to the ISO14001 certificate by the Committee on Plant Operation (consisting of representatives from local communities, public cleansing bureaus, and local government to discuss the operation of treatment plants) and the local communities have been positive, and the media have presented the plants' ISO compliance in a good light. There have also been many inquiries from local governments, private companies, and foreign governments for study tours, and we are working positively to release the manuals and other information related to the ISO14001. Several waste treatment plants, such as in Kyoto and in Ohmiya, will receive an ISO14001 certificate by April, 2000, and we hope that this trend will continue to spread across the nation.

Individual plants have achieved remarkable improvements through this system in the clarity of operational procedures, in the attitudes of employees, and in their awareness. Furthermore, as part of the improvements we have reduced dioxin emission by better control of the incineration process, and saved costs through increasing the efficiency of electricity generation and reducing the water consumption by use of rain water.

Seven more plants run by Tokyo's Bureau of Waste Management and Reclamation and Cleansing Operation Offices (responsible for landfill operation, sorting of incombustible wastes, waste volume reduction, pulverization of bulky wastes, and municipal waste) have

been preparing to receive an ISO 14001 certificate in fiscal 2000, and are now building their Environmental Management System.

(Akio Ishii)

**Movements Related to
the Packaging Waste Recycling Law**

Japanese waste treatment in the year 2000 will center on enforcing the overall recycling activities of packaging waste. This will be achieved through complete enforcement of the Packaging Waste Recycling Law. The law, partly enforced in April 1997, obliged the recycling of glass containers, cans, PET bottles, and corrugated cardboard. In addition, paper and plastic containers, other than corrugated cardboard and PET bottles, will also be recycled from this April. (For an outline of the Packaging Waste Recycling Law refer to Issues No.13, Jul.95; No.14, Oct.95; and No.21, Jul.97 of the Newsletter).

The basic policies and recycling plans to cover the recycling of paper, apart from corrugated cardboard, and of plastic containers, excluding PET bottles, were determined on 28th July 1999.

After sorting, packaging made from corrugated cardboard and paper containers, excluding drink cartons, will be processed to pulp, recycled-content goods, temperature buffers used in steel melting, or fiber bedding used in

agriculture. If there are technical difficulties, or the degree of environmental damage is great, the paper will be reprocessed to refuse derived fuel.

Plastic containers, except PET bottles, will be converted to raw materials for plastic containers, such as pellets, plastic products, reducing agents used in blast furnaces, alternative raw materials in coke furnaces, oils, or hydrocarbon gas. At first, the outlines included methods for recycling plastics included production raw materials and liquefaction, but later other uses were added, such as production of reducing agents.

From April 1997, under the law glass containers have been converted to cullets, and PET bottles to raw materials, such as flakes and pellets.

Almost all the packing wastes in Japan will be recycled from this April, and there will be extensive volume reduction for waste delivered to treatment plants, particularly landfills and incineration plants.

The success of the new recycling law relies on the cooperation and the participation of consumers, for, unlike glass and cans, the recycling of paper and plastic packaging require strict, separate discharge. We expect the new changes would be a great leap forward in Japan's closed loop society.

(Hiroki Hashizume)

Total Weight of Packaging Waste Estimated to be Sorted and Planned to be Recycled

(unit: 1000ton)

	Actual		Estimated to be Sorted and Planned to be Recycled				
	F.Y.1998	F.Y.1999	F.Y.2000	F.Y.2001	F.Y.2002	F.Y.2003	F.Y.2004
Glass containers total	734	1,095	1,008	1,062	1,109	1,150	1,179
Clear glass	322	542	459 (270)	484 (270)	505 (270)	525 (270)	537 (270)
Brown glass	274	397	369 (200)	388 (200)	406 (200)	420 (200)	431 (200)
Other glass	137	156	180 (140)	190 (150)	198 (160)	205 (180)	211 (220)
Paper containers			87 (66)	120 (133)	153 (133)	197 (133)	213 (133)
PET bottles	48	59	103 (72.7)	120 (72.7)	131 (72.7)	140 (72.7)	147 (72.7)
Plastic containers			239 (121)	389 (192)	487 (202)	636 (202)	701 (268)
Polystyrene trays			8	12	15	18	20
Steel	472	636	576	599	620	637	652
Aluminum	121	187	173	181	190	196	202
Corrugated cardboard			435	459	486	519	536
Cartons	9	37	28	32	36	40	43

Upper Figure: weight of waste estimated to be sorted

Figure in parentheses: weight of waste planned to be recycled

Note: glass containers total may not be the sum of clear glass, brown glass, and others.

**Universities and Research Institutes Concerned with
Waste Management in Japan (5)
- Laboratory of Solid and Hazardous Waste
Management, Department of Civil and Environmental
Engineering, Nagaoka University of Technology -**

Research at the Department of Civil and Environmental Engineering in Nagaoka University of Technology is divided into six groups, half of which is in the field of Civil Engineering, and the other of Environmental Systems Engineering.

Environmental Systems Engineering groups were established in 1994, and consist of the Environmental Information Engineering group, the Environmental Protection Engineering group, and the Planning and Social Engineering group. The ultimate goal of these groups is to address the environmental problems both at the regional scale and the global scale, with an integrated view. The Laboratory of Solid and Hazardous Waste Management belongs to the Environmental Protection Engineering group, that covers management and technologies for water and waste substances.

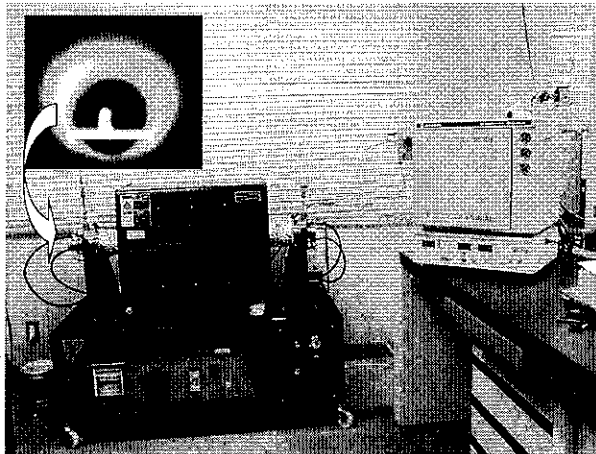
The laboratory is currently researching the following theses: 1) optimization of melting process for incineration ash from municipal solid waste (MSW); 2) behavior of pyrolysis and gasification for MSW; 3) safety assessment of wastes through bioassays; 4) anaerobic bioremediation of soil and groundwater contaminated with chlorinated ethylenes; 5) aerobic wastewater treatment with membrane filtration; 6) advanced purification for drinking water by biological activated carbon. This article introduces topics 1) to 3), which are directly related to waste management.

Optimization of Melting Process for Incineration Ash from MSW

Waste melting, which vitrifies wastes by thermal treatment, is accepted as an effective recycling technology. At the laboratory we are investigating the melting of MSW incineration ash from various views such as: 1) melting properties of ash from an economic view; 2) physical strength of melted slag in view of its quality; and 3) leaching of heavy metals from melted slag in view of environmental safety. We are now focusing on the effect of the compositions of ash and the melting condition (oxidized or reduced).

Behavior of Pyrolysis and Gasification for MSW

Pyrolysis and gasification are under development as new thermal waste treatment technologies that aim to minimize environmental impact. The purpose of this research is to clarify the behavior of pyrolysis for changes in MSW composition. The experiments are conducted with a thermograph and a tube furnace. We propose a prediction model of the material balance from the tube furnace experiment.



A laboratory size tube furnace system and the internal monitor

Safety Assessment of Wastes through Bioassays

Chemical substances used in industry, some of which are disposed of as waste, have been rising annually in their variability. Therefore, it is increasingly necessary to use bioassays to assess the safety of waste. We conduct two types of bioassays to evaluate and to control the safety of wastes that are disposed of to landfills. One is the Ames mutagenicity test to evaluate the genotoxicity of waste, while the other is a toxicity test using *Daphnia magna*, a key species in the ecosystem, to evaluate the ecotoxicity of waste.

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Phone and Fax: (+81)258-47-9662.

JSWME's 10th Anniversary Research Conference and the International Session

The JSWME held its annual research conference on October 26 - 28 in Ohmiya. With 1,541 participants in total, the society celebrated its 10th anniversary, held a memorial symposium on perspectives of waste management in the 21st century, and presented as many as 366 research papers.

Also, on October 27, there was an International Session conducted in English attracting 80 attendants. The International Session was the sixth English Session held cooperatively by the JSWME and the Korea Solid Wastes Engineering Society (KSWES). The session is held alternately in Japan and in Korea, under the Agreement of Cooperation between the two societies. This time, the session was divided into four sub-sessions: I) Waste Management Planning, Landfill (6 papers); II) Physicochemical treatment of Industrial Waste (5 papers); III) Waste Plastics and Organic Waste (5 papers); and IV) Composting (3 papers). Two sub sessions were held concurrently, and each sub-session was co-chaired by a Japanese chairperson and a Korean chairperson. Among

the 19 papers, eight papers were by members of JSWME, and the remaining eleven were by KSWES members. In May 2000, the two societies are going to hold their seventh English Session in Korea. For people interested in the Session, please contact either the JSWME or the KSWES secretariat. And after that, we are looking forward to seeing you in the eighth session which will be held in Sapporo, Japan, in November 2000.

(Hiroki Hashizume)

Announcement
- 2000 PBC and APLAS Fukuoka 2000 will be Held -

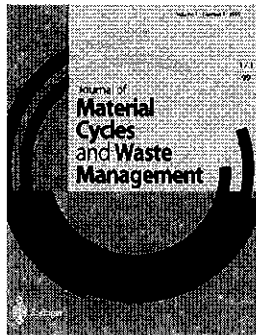
The 9th Pacific Basin Conference on Hazardous Waste sponsored by the Pacific Basin Consortium for Hazardous Waste Research and Management, of which JSWME is a member institution, will be held in Manila, Philippines on April 10 - 14, 2000. 2000 PBC will have a technical sessions on various aspects of hazardous waste management, training courses, poster sessions, and collaborative research planning meetings, etc. For interested parties, please contact the Executive Secretariat of PBC; telefax: (+63)2-927-1745.

JSWME will jointly hold the Asian Pacific Landfill Symposium in Fukuoka 2000 with Fukuoka Municipal Government, etc. from October 11-13, 2000 in Fukuoka-city (see JSWME NEWSLETTER No.20, April 1999).

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The JSWME's Journal of Material Cycles and Waste Management Newly Published

From November 1999 the JSWME began to publish the "Journal of Material Cycles and Waste Management", an official English journal. The two focuses of the Journal are: research in technical, political, and environmental problems of material cycles and waste management; and information that contributes to the development of an interdisciplinary science of material cycles and waste management. Experts on material cycles and waste management from all parts of the world are encouraged to submit their work for publication; Asia-related research and other information are especially welcome. In the year 2000, we are going to publish two issues, and we welcome your manuscripts, subscription, and contribution to our new journal.



Journal of Material Cycles and Waste Management,
Vol. 1, No. 1 (November 1999)

Recent issue of the Journal of Material Cycles and Waste Management contains the following articles. The articles are written in English.

EDITORIAL

Message from the editors

REVIEW ARTICLES

Recycling and waste management from the viewpoint of material flow accounting

Y. Moriguchi

Recent trends in recycling activities and waste management in Japan

M. Tanaka

ORIGINAL ARTICLES

The German packaging ordinance: the questionable effects of a fragmentary solid waste management approach

E. Staudt, M. Schroll

Evaluation of electronic components in life cycle assessment

T. Ueno, T. Shiino, H. Onishi

Trends in waste plastics and recycling

T. Kasakura, R. Noda, K. Hashiudo

Mass balance of arsenic and antimony in municipal waste incinerators

N. Watanabe, S. Inoue, H. Ito

Fabric-filter-supported catalyst for removal of harmful solid and gaseous compounds in municipal waste incinerator exhaust gas: characteristics of NOx reduction

K. Fujita, G. Sasaki, K. Kobayashi

Distribution of organophosphoric acid triesters between water and sediment at a sea-based solid waste disposal site

Y. Kawagoshi, I. Fukunaga, H. Itoh

Substance flow analysis of coplanar PCBs released from waste incineration processes

S. Sasaki, T. Ukai, H. Takatsuki, K. Nakamura, S. Kinoshita, T. Takasuga

ANNOUNCEMENTS

Journal of the Japan Society of Waste Management Experts,
Vol. 10, No. 5 (September 1999)
& No. 6 (November 1999)

Recent issues of the Journal of JSWME contain the following articles. The articles are written in Japanese, but the abstract is in English.

Vol. 10, No. 5 (September 1999)

Paper

Comparison of the Ozone/Hydrogen Peroxide Process,

the Ozone/Ultraviolet Process, and the Hydrogen Peroxide/Ultraviolet Process in the Treatment of Landfill Leachate

Ken-ichi Shishida, Hiroto Haruki, Keiichi Kamio, Harumi Yamada, Koji Kosaka and Saburo Matsui

Oxidation of Garbage in Supercritical Water

Fang-Ming Jin, Atsushi Kishita and Heiji Enomoto

Life Cycle Analysis of the Recycling of Food-Oil Waste Material as Detergent

Shihoko Shizume, Naoko Sakata and Kikuo Miyokawa

Leaching Behavior of Untreated and Phosphate Treated Fly Ash from Municipal Solid Waste Melting Facilities and Minerals Formed in Phosphate Treated Fly Ash

Kiyoharu Furukawa, Akira Uchibo, Toshihito Uchida, Ichirou Itou, Tsuneyuki Yoshida, Humiaki Kambayashi, Seiichi Abe and Masayuki Kokado

A Comparative Study of the Physiomechanical Properties and Waste Water Qualities of Sosei Paper Made from SPWS and BWS

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

Note

The Clean-up of Benzo(a)pyrene-contaminated Soil by Ethanol, which is Washing with Distillation

Byung-Dae Lee, Keiko Hosaka and Masaaki Hosomi

Discussion

Discussion on "Is an RDF System with Energy Recovery Available?"

Masahiro Nakamura

The Authors' Answer to the Discussion by Masahiro Nakamura

Jeong-Soo Yu and Yasoi Yasuda

Vol. 10, No. 6 (November 1999)

Paper

Metal Concentrations in the Soil Surrounding MSW Landfill Sites

Yasumasa Tojo, Toshihiko Matsuto, Takayuki Matsuo, Hirofumi Sakanakura and Nobutoshi Tanaka

Experimental Studies on the Removal of Mercury from the Flue Gas of MSW Incinerators Using Fly Ash

Takashi Nishitani, Isao Fukunaga, Hisao Itoh and Tomohiro Nomura

The Microwave-assisted Extraction of Chlorobenzenes and PCBs from Fly Ash

Masaki Takaoka, Junichi Takada, Nobuo Takeda and Takeshi Fujiwara

Effects of Fly Ash Components on Mercury Removal in Flue Gas

Masaki Takaoka and Nobuo Takeda

Evaluation of Coal Slag in the High Temperature Removal of H₂S

Shoji Ozawa, Eizo Maruyama, Hitoki Matsuda and Masanobu Hasatani

Note

Reclamation of Coal Ash as Adsorbent after Granulation

Kohji Kakimoto, Yasuko Nakano, Yoshito Shirai, Hiroaki Ogawa and Yasuhiko Kato

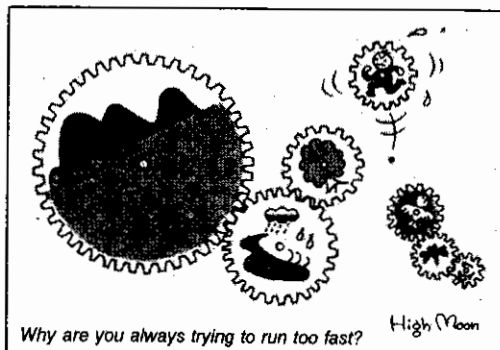
Discussion

Discussion on "A Comprehensive Evaluation of Variable Rate Pricing Policy for Solid Waste Management"

Hajime Yamakawa

The Author's Answer to the Discussion by Mr. Yamakawa

Katsuya Oshima and Yasoi Yasuda



Why are you always trying to run too fast?

High Moon

* Harmonization with others is vital in a symbiotic, closed loop society.

By courtesy of Prof. Hiroshi Takatsuki (Taka-tsuki literally means "High Moon")
(translated by JSWME, taken from Monthly "The Waste", Nov. '99)

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