



# NEWSLETTER

No.39

*This Newsletter is published four times a year, printed on recycled paper.*

January 2002

**THE JAPAN SOCIETY OF WASTE MANAGEMENT EXPERTS**

**To the World-Contributing JSWME  
- New Year Greetings -  
JSWME President, Masaru Tanaka**



We would like to wish everybody a happy new year!

How was last year for everyone? Although there were many unpleasant news such as terrorist attacks in New York, anthrax attacks, mud cow disease found in Japan occurred last year, the wonderful news of the

birth of a new baby princess last December brightened up the gloomy atmosphere here in Japan. I hope there will be many delightful topics raising hopes this year.

The number of JSWME members, including individual, public and supporting members, has exceeded 4,000 and is still growing. This fact implies how greatly JSWME is expected to overcome the numerous current waste related issues.

We have great expectations for the establishment of a recycling-based society in the 21<sup>st</sup> century. Such a society will lead to the materialization of socio-economic sustainability through reducing the consumption of natural resources. In addition, it will mitigate pollution loads into the environment through the reduction of the amount of waste generated. The Technical Research Committee of Council on Economic and Fiscal Policy under the cabinet office, where I work as a member, is broadly examining the problems we will confront to attain a recycling-based society. The committee published an interim report last November, aiming to clarify the basic vision that should be shared by a nation and the scenario for its attainment. It has proposed the following:

- 1) To establish a society where waste is treated as "resources/energy",
- 2) To reduce the amount of final waste disposal by 90% by the year 2050, and

- 3) To establish an information headquarters.

There are many problems in the world that have to be solved in order to attain the proper treatment of waste. I hope the results of the research and studies conducted by JSWME members will contribute to overcoming these problems. JSWME is greatly expected to contribute both technically and scientifically to the implementation of a waste management system based on science.

With an increase in JSWME's role, there is a growing need to improve its operation. We are therefore reviewing JSWME's work scope, the benefits to be obtained by JSWME, and its branch activities. We are also looking to reinforce its financial foundation and develop an appropriate information distribution system. We are making even greater efforts to improve JSWME, taking full account of the members' needs of JSWME based on the results of a survey conducted last year.

JSWME contributed as a core organization to the success of the Pacific Basin Conference on Hazardous Waste, which took place in Okayama last December. The conference was set up to discuss hazardous waste issues such as the treatment of PCB waste, infectious waste and waste contaminated with dioxins. Participants were from as many as 17 countries and regions. I would like to express my gratitude to all the supporters.

In order to contribute to overcoming the 10.5 billion ton world waste issue, JSWME has to be able to disseminate valuable information to the world through activities such as international conferences and international exchanges. Therefore, we would like to take necessary actions to create a society, which allows for more fruitful discussions among its members. Any suggestions or contributions of members' experiences and know-how to the English Journal or Newsletter will be greatly appreciated.

JSWME aims to be an open and ambitious society, which is operated by the members and benefits them. JSWME entreats all of its members for more active support to JWSME.

**Introduction of Laws for Establishing a  
Recycling-based Society (2)  
- Law on Promoting Green Purchasing -**

The Law for the Promotion of the Procurement of Recycled Products by National Organizations and Local Authorities on their own Initiative (referred to as the Green Purchasing Law) has been established to promote the procurement of environmentally friendly goods – such as recycled goods – and the provision of useful data concerning green purchasing.

The law specifies the types of environmental goods to be promoted for procurement as a priority, and has been in effect since April 2000. Specific procurement articles include communication/printing paper (recycled paper), official cars (low pollution vehicles), and copiers (energy saving types).

Every fiscal year, each institution of the central government formulates and publishes a policy for the promotion of the procurement of eco-friendly goods, etc. in conformance with this policy. The procurement is executed in accordance with the policy. Each institution prepares and publishes a summary of its procurement

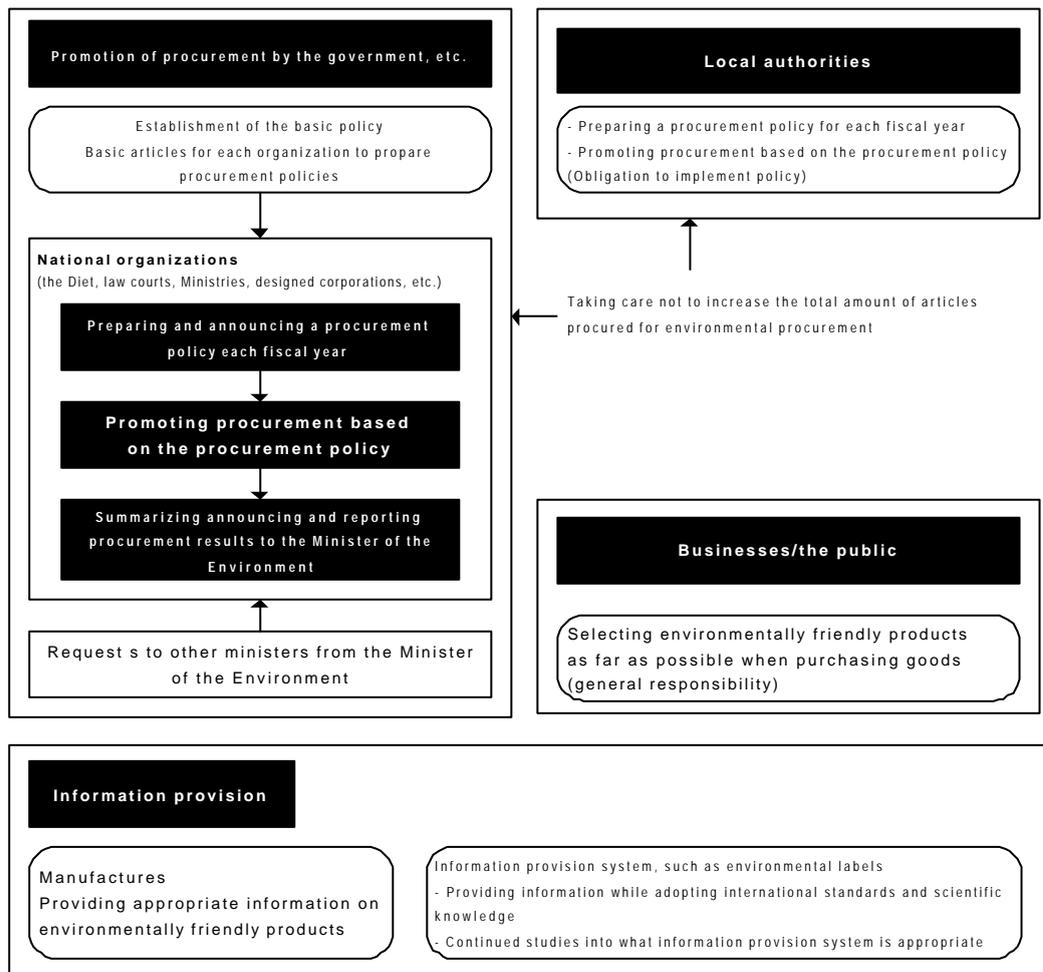
record of eco-friendly goods, etc. and submits it to the Minister of the Environment. The Minister of the Environment may request the head of each institution to take measures which are deemed particularly necessary to promote the procurement of eco-friendly goods, etc.

Local governments are requested to endeavor to take the necessary measures to convert demand toward eco-friendly goods, etc. in accordance with the natural and social conditions of each area. Business entities and citizens are also requested to endeavor to choose as many eco-friendly goods, etc. as possible when buying or renting goods or receiving services.

As the provision of information on the environmental impacts of goods is necessary to enforce the law, manufactures, traders, etc. are requested to endeavor to provide in an appropriate manner, the necessary information, which is based on scientific knowledge and in conformity with international agreements.

Incidentally, as Prime Minister Koizumi has given the order to purchase eco-friendly cars, all vehicles owned by state organizations will be replaced with low pollution-load vehicles by 2005.

(Kimio Matumoto)



Source: Homepage of Mnistry of the Environment

**Framework of Green Purchasing Law**

## Incineration of Municipal Solid Waste in Japan (5) / The Original Idea of Incineration and the Direction

In this series we have introduced the following topics: 1) The present status of incineration in Japan (No.30), 2) The change of regulations on incinerators, including pollution control (No.32), 3) Waste heat utilization (No.34), and 4) The next generation type incinerator (No. 38). This article finalizes the series discussing the problems of incineration versus its fundamental function and the future direction of incineration as an effective and appropriate solid waste processing technologies.

### 1. Advanced incinerators and small ones

You must be surprised with the high-rise stacks installed near residential areas in Tokyo. Most of them are MSW incinerators with elaborately designed buildings and stacks over 150m. This kind of incinerator is equipped with large, state-of-the-art furnaces, a variety of pollution control devices and power generators. Many manufactures from such steel industries as shipbuilding and processing enter the market with competitive technologies. Meanwhile the construction unit cost of these advanced incinerators reaches 30 million yen/ton/day and O&M costs through the life of the incineration plant far exceeds the initial expenditure. The average MSW disposal cost in Japan is about 45,000 yen/ton or 18,000 yen/head. In general the total MSW budget occupies nearly 5% of the municipality's general account.

There is also a wide range of small incinerators in Japan – from ones small enough for residential use to big enough for use in a small municipality. It is estimated that the number of small incinerator manufacturers is over 200. Some of them are uniquely designed and show superb performance, though quite a few are mere burning boxes. Recently, the number of small incinerators is decreasing due to the strict dioxins emission regulation and the change of municipal policy.

### 2. Waste composition and pollution control

Dioxins have been the most important matter of concern in waste incineration. However, we should be reminded that smoke and bad smell have at one time caused NIMBY syndrome. In the days when the moisture content of MSW was high and the calorific value was under 1,000 kcal/kg, stabilized combustion was extremely difficult to achieve, as it then required constant auxiliary fuel use. Nowadays, both technological advances and the present 2,000kcal/kg calorific value have indeed made stabilized combustion and heat recovery possible. It seems that the black smoke and odor problems have disappeared behind newly emerging emission problems

such as acid gases, Hg, dioxins and so on. From the fundamental viewpoint of incineration, however, preventing smoke and bad smell is a technical issue that must not be forgotten. Improper operation surely results in the emission of many kinds of hazardous materials, including dioxins, and even more so in uncontrolled small incinerators.

### 3. Basic principle of solid waste incineration

Incineration is a rapid thermo-chemical reaction that converts putrescible and pathogenic organic solid waste into inert inorganic materials. Even hazardous chlorinated organic compounds can be decomposed into inorganic CO<sub>2</sub>, H<sub>2</sub>O and HCl under strictly controlled combustion with a properly designed incinerator. Strict but fundamental conditions means keeping proper 3T (Temperature, Time and Turbulence) combustion conditions, and a proper amount of remaining O<sub>2</sub> is also important. To keep a high enough combustion temperature, the insulation structure of the furnace is indispensable and an excessive air supply must be avoided. To keep Time (Retention time in a high temperature zone), a furnace with a large enough capacity is required (though it brings about a decreasing furnace temperature). Turbulence of combustible gas is necessary for mixing combustible gas and oxygen and promoting complete combustion. You should remember that municipal solid waste is usually a solid fuel of poor quality and generates much decomposed combustible gas during the first stage of incineration. Therefore, the combustion chamber must be designed to accelerate the mixing of decomposed gas and excess air. The pyrolysis-afterburning type has an advantage in this point, particularly in a small incinerator.

The combustible gas cooling process is important to remove condensable components, which almost always contain heavy metals such as Cd, Pb, and Zn. Most of them are in a gaseous phase when the combustion temperature of the gas is higher than 400 . Therefore a dust precipitator must be installed after the process of gas cooling. Consequently, such fly ash contains heavy metal compounds in chloride or oxide forms. On the other hand, a combustible gas cleaning device to remove acid gases such as HCl, SO<sub>x</sub> (NO<sub>x</sub> removal needs oxidation or reduction process) should be installed depending on the location. The most crucial technical problem of open burning is that the process never takes care of the above-mentioned points. It is very difficult to stop the small scale open burning of solid waste as well as clandestine dumping because of solid waste's characteristic of being easy to transport and people's unawareness of environmental protection.

#### 4. Incineration and its Direction

The fundamental merit of incineration is the quick and reliable decomposition of perishable/pathogenic organic waste, which is constantly generated in adherence to our daily lives. It should be stressed that this extremely effective method of reducing waste volume conserves the limited disposal sites in Japan. However, it also must be recognized that rapid thermo-chemical reactions in urban areas may have a significant environmental impact if O&M is not ensured even in an advanced incinerator. Open burning must be heavily restricted except in special cases. The enlargement in scale of incinerators is preferable for the sophistication of incineration and the construction of cross-regional facilities have been promoted in Japan recently. Though small incinerators are apt to be rejected, well designed small incinerators under appropriate operational conditions should be reevaluated for the on-site disposal of infectious waste and non-hazardous halogen-free solid waste, as long as they satisfy the fundamental combustion conditions and ensure pollution control in taking care of hazardous material emission.

(Hideo Azuma)

#### Introduction of Institutes with SWM Program/ Center for Environmental Science in Saitama

In order to cope with today's demands on the environment and appropriately handle the diverse and evermore complicated environmental issues, the Saitama prefectural government established the Center for Environmental Science in Saitama (CESS) in April 2000.

CESS is a multi-functional comprehensive core institute for environmental science that supports people in the prefecture who are dedicated to resolving environmental issues. The institute carries out research/testing and offers environmental education to cope with the environmental issues that Saitama prefecture is facing, while striving for international cooperation on environmental issues.



The facilities of CESS include several buildings such as a laboratory, an exhibition hall and a dormitory (total building floor space: 8,722 m<sup>2</sup>). There is also an ecology field (2.2 ha) where the natural vegetation that exists in the eastern region of the prefecture is reproduced across an area of about 4 hectares.

#### 1. Basic Functions

##### (1) Environmental Education

CESS provides study opportunities for the prefecture's populace to specifically consider what kind of actions to take and practices to follow for environmental conservation. It allows the people to consider the symbiotic relationship between society and the environment, rather than simply offering information on environmental issues. The main function is as an exhibition hall where a hands-on type of exhibition is prepared. The ecology field is used for outdoor environmental education.

##### (2) Research and Testing

CESS also functions as a research institute that can handle a wide range of environmental issues. It consists of six groups; "The Atmospheric Environment", "The Water Environment", "Waste Management", "Chemical Substances", "Environmental Geo-technology, Sound and Vibration", and "The Natural Environment". As an inter-group study team, "The Soil and Groundwater Contamination Recovery Team" has been permanently established.

##### (3) International Cooperation

CESS contributes to the transfer of technology to developing countries by sending specialists to developing countries and accepting trainees from such countries. Furthermore, it actively carries out exchange in research activities with overseas research institutions and encourages international cooperation such as monitoring activities related to global environmental issues. Accommodation is also available at the center for trainees and researchers from overseas.

##### (4) Provision of Environmental Information

Information on environmental education to the prefecture's populace, information on experimental research/testing to support research activities, and information on environmental administration that is useful for understanding environmental decrees are provided via the Internet (<http://www.kankyou.pref.saitama.jp/>), etc.

#### 2. Research Activities in Waste Management

In the field of waste management, the following study areas are covered: Studies on waste information

management, Studies on hazardous and toxic waste management, Studies on intermediate treatment, Studies on final disposal engineering, and Studies on waste recycling.

The current research topics are as follows: (a) The characterization of congener groups in PCDD/Fs emitted by various types of incinerators, (b) Research on incineration for waste treatment, (c) The characteristics of chemical substances emitted from incinerators for wastes treatment, (d) The decomposition of dioxins in ashes by the supercritical fluid extraction and ultraviolet irradiation method, (e) Environmental impacts in landfill of waste

plasterboards, (f) The biological degradation and stabilization mechanism of organic wastes in landfill sites, (g) Transfer mechanisms of landfill gas in landfill sites, and (h) The reduction of organic contents in residual soil discharged from shredding and separating facilities.

(Kiyoshi Kawamura)

#### JSWME's 12th Research Conference and the International Session

JSWME held its annual research conference from October 31-November 2 in Yokohama City, 30 km south of Tokyo. The number of research papers presented during the conference was 383 and the participants totaled 1,568.

The International Session was held on November 1, in English, and attracted about 40 attendants. This is the fifth International Session since initiated as a Japan-Korea session in 1997. This followed the conclusion of a cooperative agreement between JSWME and the Korea Solid Wastes Engineering Society (KSWES) in 1996. The Korea-Japan session has been held in annual KSWES conferences since 1998. As that time, we had 23 participants from Korea.

The session was divided into four sub-sessions:

1) Waste Management Planning, Waste Reduction and Recycling (5 Papers); 2) Landfill, Leachate Treatment and Composting (5 papers); 3) Dioxins, Incineration and Pyrolysis (6 papers); and 4) Hazardous Waste and Others (6 papers). Each sub-session was co-chaired by a Japanese and a Korean chairperson. Of the 22 papers, nine were by JSWME members including foreigners and the remaining thirteen were by KSWES members.

Next year, the eleventh annual conference will be held in Kyoto, which is well known as the most traditional city in Japan. We are expecting more English papers and speakers in next International session and looking forward to meeting you there.

(Takashi Miyagawa)

#### 2001 PBC in Okayama was held

The 10<sup>th</sup> Pacific Basing Conference on Hazardous Waste was held in Okayama City from December 5-7, 2001. Experts from 17 countries and regions participated and discussed extensive topics including PCB and Infectious waste. The detail of the conference shall be reviewed in the following NEWSLETTER.



Opening Ceremony of 2001PBC in Okayama

(Hideo Azuma)

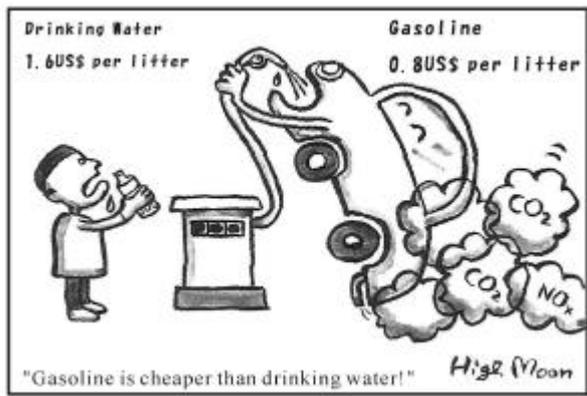
#### Subscription of our NEWSLETTER

Dear readers,

As mentioned in previous issue, we are changing our NEWSLETTER publication manner from paper to e-publication. This issue may probably be the last paper publication. The latest issue as well as recent back numbers is available now and in the future in JSWME Home Page <http://wwwsoc.nii.ac.jp/jswme/indexe.html>.

We also are planning to distribute our e-NEWSLETTER exclusively to registered readers. If you wish to subscribe our e-NEWSLETTER in the future, please send us your e-mail to [hazuman@kankyo.metro.tokyo.jp](mailto:hazuman@kankyo.metro.tokyo.jp). Thank you for your favor and interest in our NEWSLETTER.

(from Editor)



Under such circumstances, energy saving cannot be done well

By courtesy of Prof. Hiroshi Takatsuki (Taka-tsuki literally means "High Moon")  
(translated by JSWME, taken from Monthly "the Waste" October 2001)

**Journal of the Japan Society of Waste Management Experts, Vol.12, No.5 (September 2001)**

The latest issues of the Journal of JSWME contain the following articles. The articles are written in Japanese with the abstract in English.

**Waste Management Research**

Preface

*The Earth from the Cosmic Eyes and the Citizens' Eyes*  
Shoji Sano

Special Issues: Legal Systems for Recycling

*Introduction of the Special Issue*

Kazuhiro Ueta

Conversation

*Legal Systems Promoting Towards a Closed Loop Material Cycle Society*

Tkahihiro Eguchi, Eiji Hosoda, Kazuki Kumamoto and Ikuko Haga

*Outline of the Basic Law for Establishing a Recycling-based Society*

Takahiro Eguchi

*The Consequence and the Issues of the Basic Act for Establishing Recycling-based Society*

Otsuka Tadashi

*Toward Legislation of Proper Waste Treatment and Recycling of ELV -The Present Circumstances and the Future Perspective of ELV Recycling-*

Eiji Hosoda

*The Problems of "The Home Electric Appliances Law" & "The Containers and Packaging Law" and the Subject of Recycling Laws*

Kazuki Kumamoto

*Recycling Laws from the Viewpoint of Citizens*

Ikuko Haga

Report

*Determination of Model Wastewater Contents Discharged from Domestic Disposal*

Yoshinori Takezaki, Yasutoshi Shimizu, Yuhei Inamori and Toshihiro Sankai

**Journal of the Japan Society of Waste Management Experts**

Papers

*Production Process of Mutagens in Landfill Site received Incineration Residue-*

Ayako Tachifuji, Yasushi Matsufuji, Masataka Hanashima and Kazuko Miyano

*Cost Analysis of Waste Paper Collection Systems for Medium and Small-scale Businesses in regards to Collection Efficiency and Indirect Cost*

Shinya Suzuki, Hironari Gotoh, Michiko Yokoyama and Kazuo Yamamoto

*Evaluation of Heavy Metal Solubilization in Solid Waste Landfill Layers*

Takeshi Kurokawa, Toshiko Komatsu and Takehiko Fukushima

*Life Cycle Assessment on Food Waste Management and Recycling*

Yasuhiro Hirai, Masaki Murata, Shin-ichi Sakai and Hiroshi Takatsuki

*Evaluation and Policy Analysis on the Recycling System of PET Bottles*

Yasoi Yasuda and Kohei Urano

Current Members of JSWME	As of 30 November 2001 (values in parenthesis are differences from 30 September 2001)
Regular Members	3,599 (62)
Students	273 (35)
Non-Japanese Members	71 (7)
Public Institutions	116 (0)
Supporting Members	216 (-1)
<b>Total</b>	<b>4,275 (105)</b>

NEWSLETTER NO.39

Published by

Prof. Masaru Tanaka, President,  
The Japan Society of Waste Management Experts  
Edited by

Prof. Isamu Yokota, Chairman,  
International Relations Committee  
Buzen-ya Bldg. Shiba 5-1-9, Minato-ku,  
Tokyo 108-0014, Japan

Phone (+ 81) 3-3769-5099

Fax. (+ 81) 3-3769-1492

<http://www.soc.nii.ac.jp/jswme/index.html>

January, 2002