



# NEWSLETTER

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April 2009

**THE JAPAN SOCIETY OF MATERIAL CYCLE AND WASTE MANAGEMENT**

## The name of the society has changed!

This year, amidst the world economic crisis, we mark the 20<sup>th</sup> anniversary of JSMCWM. The social circumstances which surround waste management issues have changed over the past 20 years and adapting to the new “material cycle” style of society requires certain social activities. Consequently, JSMCWM has incorporated and to initiate its new activities has changed its name to the Japan Society of Material Cycle and Waste Management (JSMCWM).

In rapidly evolving Asian economies, public nuisances are becoming more and more obvious. I’m sure I’m not alone in recalling the benefit brought about by the Tokyo Olympics during the heart of Japan’s economic development and in recognizing that the development process of those Asian countries may overlap our own. Most probably, and in the near future, these neighbouring Asian countries will face serious social problems brought about by water and air pollution, waste problems, resource energy and global environmental problems.

Amid the call for a green New Deal policy, the academics, government, bureaucrats, businesses and citizens that form our organization all play an important role for us to conduct new activities with an eye on the Asia Pacific. Our international committee has played a central role under the direction of the executive committee in holding “The Expert Meeting on Solid Waste Management in Asia and Pacific Islands (SWAPI)” since 2005 aiming to create a network of experts for waste management in the Asia Pacific. This year the 6<sup>th</sup> meeting of SWAPI will be held in Nagoya on September 16~18.

As chairman of the international committee, I plan to work diligently on our alignment with the Korea Society

of Waste Management (KSWM), the internationalization of our society and other issues to further develop the new society. The support and combined efforts of all our members is greatly appreciated.

(Yasushi Matsufuji)



## Dear Subscribers

The editorial members of this newsletter were changed since Issue 66. The greeting in this issue is made by Mr. Azuma, one of the editorial members of the society who was involved from the newsletter’s inception until Issue 65, and offers a look back at those early days.

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The Japan Society of Waste Management Experts (JSWME) was established in March, 1990, and this year re-established as the Japan Society of Material Cycles and Waste Management. JSWME had already embraced the philosophy of material cycle, yet a fresh new name was selected to keep in tune with Japan’s stance to promote 3R.

Solving waste-related problems is a common issue amongst the cities of the world, and since its establishment, the Society has operated an international committee and promoted international exchange. Our Newsletter is one such activity which provides various points of view through news and articles about the trends of waste management in Japan to overseas members. I am proud that this is considered an important source of information on waste management trends in Japan for overseas experts.

Our very first newsletter was published in November 1990 when we published an issue twice a year, until 1994 when the number of articles increased and we began to issue them quarterly. The newsletters were distributed by mail at the beginning, and then electronically since Issue 41 in July 2002. This contributed to improve the speed at which we could distribute information and ease with which readers could access the newsletter.

The newsletter will continue to try out new approaches amid changes in its editorial staff, international committee members and its Chairman. Since the international committee is in charge of the SWAPI secretariat, established to tackle waste problems in Asia Pacific countries and regions through collaboration and cooperation, the newsletter will include news about SWAPI and is now considering introducing letters from readers.

As the newsletter continues to develop, I plan to remain involved in producing the newsletter as part of the editorial team and hope to enrich our offering as a distributor of information in addition contributing to further international cooperation.

Lastly, I would like to thank all of our subscribers for your support in realizing these aims.

(Hideo Azuma)

### **The Hydrosulfuric Gas Problem in Japan**

Japan experienced a close-up look at the problem of waste and hydrosulfuric gas when 3 people died in

October 1998 in Fukuoka Prefecture while sampling the effluent of a water tank at the Chikushino city landfill site for stable waste.

A survey by the Ministry of Health and Welfare at the time, March 2000, revealed that such hydrosulfuric gas problems occurred in eleven of 1,474 facilities. As shown in the table below, ten of those eleven facilities are landfill sites for stable waste. The cause of hydrosulfuric gas generation at landfills for stable waste is currently being clarified since more cases were observed in landfills where plaster boards and mixed construction wastes were discarded in larger amounts. The conditions in which the gas is likely to be generated are where (1) there is a high moisture content or wastes are submerged in water, (2) the area has become deoxidized, (3) there are organic materials (organic acid), and (4) pH neutral conditions propagate sulfate reducing bacteria.

There is still no clear answer to the question of whether hydrosulfuric gas always occurs at landfill sites where construction waste is disposed, although the probability is high that this gas will be created when conditions 1~4 given above are met. These conditions were examined by investigating a landfill site for stable waste. Using a boring bar, holes were dug at the site 80cm directly below the cover soil layer. Then sealable tubes were inserted to capture the hydrosulfuric gas, and the gas was measured 30-60 minutes later. The result of the measurement is shown in Figure 1. This landfill for stable waste was a former rock drilling field and it has rich moisture content inside its cone-shaped hollow bottom, contained disposed construction waste, and contained less organic waste (wood waste) compared to other landfill sites. However, given these conditions, hydrosulfuric gas remained trapped in the layer of waste under the cover soil.

On the other hand, it was also revealed that hydrosulfuric gas is less likely generated at landfill sites that are well drained. In addition, it is believed that sulfate reducing bacteria is not easily bred in municipal solid waste landfills where ash and crushed residues are disposed due to the alkaline condition created by ash. However, it was confirmed that the gas is rather likely to be

generated under the areas which contain high moisture and develop a neutral pH.

In May 2008, an accident occurred in a sealed underground piping pit of a hotel in the downtown area of Matsue city in Shimane prefecture. A large amount of construction waste, including plaster board, had been disposed of in the pit and hydrosulfuric gas leaked out into the surrounding area causing roads to be blocked and 8 hotel employees to be taken to the hospital. The apparent cause was that the nearly air-tight pit in the basement of the hotel was submerged under rain water for an extended period, creating anaerobic conditions which, in turn, likely created hydrosulfuric gas at a density of over 2000ppm. Thus, hydrosulfuric gas can be generated not only at landfill sites, but also in places where construction wastes are incorrectly disposed.

Table 1: The hydrosulfuric gas density inside the layer and surrounding area of the landfill site for stable wastes. Source: Investigation by the Ministry of Health and Welfare in March, 2000. Report: Investigation for the provision of the hydrosulfuric gas problems in the landfill sites (September, 2000)

Prefecture	Year of installation approval	Size		Hydrosulfuric gas concentration	Measurement points	Methods of measurement
		Area(m <sup>2</sup> )	Capacity(m <sup>3</sup> )			
Fukuoka	1983	ca.35,000	ca.340,000	15,000ppm	Boring holes (15m deep)	Detecting tube
	1993	ca.56,000	ca.1,035,000			
Shiga	1994	ca.9,000	ca.122,000	15,200ppm	Boring holes (9m deep)	Detecting tube
Chiba	1985	ca.27,000	ca.228,000	More than 0-120ppm	Boring holes (30cm deep)	Detecting tube
Chiba	1984	ca.39,800	ca.560,000	More than 0-120ppm	Boring holes (30cm deep)	Detecting tube
Chiba	1985	ca.76,000	ca.1,570,000	0-2ppm	Boring holes (30cm deep)	Detecting tube
Okayama	1990	ca.76,000	ca.1,849,000	3300ppm (after treatment 0.26ppm)	Gas ventilation tubes	Detecting tube and GC method
Fukuoka	1989	ca.19,000	ca.220,000	100ppm	Vertical collection tubes	Detecting tube
Fukuoka	1990	ca.10,900	ca.134,000	0.2-2.0ppm	1m above the point of largest odor in the landfill site	Detecting tube
Tochigi	1991	ca.61,600	ca.1,320,000	0.008ppm	2 points at the border of the ground	GC method
				0.006ppm		
Miyagi	1990	ca.67,800	ca.322,000	Less than 0.002ppm	2 points inside the landfill	GC method
				0.183ppm		
Miyagi	1990	ca.67,800	ca.322,000	Less than 0.15ppm	1.5m above the ground in the landfill	Detecting tube

In this way, it can be said that the causes of the hydrosulfuric gas generation are a mixture of waste plaster boards and organic wastes, and improper moisture control. Control of the waste quality is the most important measure to prevent gas generation, though water infiltration control is also very important in a country with high rainfall such as Japan.

Environmental problems of hydrosulfuric gas due to

waste disposal and illegal dumping may already exist in

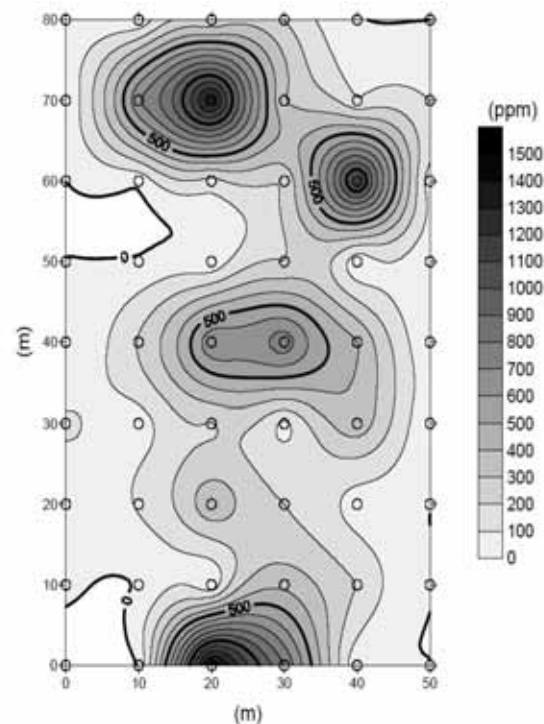


Figure 1: As shown here, distribution of hydrosulfuric gas density 80cm below the ground of the landfill site for stable waste where rich in moisture.

other Asian countries, although there is little information and such cases are rarely reported in order to identify the kinds of waste or what disposal conditions cause the hydrosulfuric gas. As a request, if any of our readers has access to such information, please contact the author of this article and the international committee of the Society.

(Yusaku Ono)

**Japan's ODA on SWM  
The Project for Integrated Solid Waste Management  
for Municipalities in the Republic of El Salvador**

### 1. Background and Project Purpose

In El Salvador, municipalities are responsible for solid waste management (SWM), but many of them are unable to solve problems such as non-collection of solid waste, open dumping in valleys, and mixed dumping of infectious and medical waste at general waste disposal sites intended for non-hazardous waste. These problems stem from the fact that municipalities lack capacity in terms of funding, personnel, machinery and equipment, and small-sized municipalities often lack technical skills.

Despite these circumstances, several municipalities formed a regional administrative association to tackle SWM problems and the government of El Salvador requested the Japanese government to provide technical assistance that would promote the activities needed to support municipalities on SWM issues. In response to this request, the Japan International Cooperation Agency (JICA) implemented the “Project for Integrated Solid Waste Management for Municipalities in the Republic of El Salvador” over a period of about 35 months from May 2006 through March 2009.

## 2. Basic Frame of the Project

The basic aim of the project was to employ integrated solid waste management techniques (ISWM) for capacity development of the Central Government (CG) of El Salvador (consisting of Ministry of Environment and Natural Resources, Ministry of Public Health and Social Assistance, and Salvadorian Institute of Municipal Development) using the following basic framework.

Overall Goal	Municipalities to implement ISWM to improve environmental sanitary conditions in the Republic of El Salvador.
Project Purpose	The CG to strengthen its capacity to apply ISWM to municipalities in El Salvador and decide to implement the strategic promotion plan of ISWM within its authority.
Output	<ol style="list-style-type: none"> <li>(1) The CG develops models in the nine municipalities of ASINORLU for ISWM.</li> <li>(2) The CG develops feasible ISWM guidelines which are adapted to the present conditions of municipalities in El Salvador.</li> <li>(3) The counterpart personnel (C/P) in the CG acquire knowledge and experience on ISWM.</li> <li>(4) The C/P in the CG acquire the capabilities to conduct training and to raise awareness on SWM of municipal administrators etc. in El Salvador.</li> <li>(5) The CG develops a draft strategic promotion plan of ISWM to municipalities in El Salvador.</li> </ol>

Notes;

- 1) ASINORLU is the municipal association composed of 9 municipalities where the pilot project is implemented.
- 2) ISWM: Integrated Solid Waste Management

To produce the output given above, several activities were carried out. These included the planning and

implementation of a Pilot Project on ISWM in ASINORLU, the formulation of ISWM guidelines for the municipalities in El Salvador and the elaboration of a draft *strategic promotion plan* of ISWM (SPP) under the Consultative Council established in the project. (The SPP was approved by the Joint Coordination Committee (JCC) of the CG and is scheduled to be incorporated in the national solid waste policy which is presently under revision).

During the project the Salvadorian C/P held meetings nearly every week--more than 120 times in total. These meetings contributed to mutual understanding among the people involved and were efficient in leading them to remain aware of the project situation, in addition to enhancing the initiative of the Salvadorian side and increase their active participation in the project.

Moreover, prior to the introduction of a sanitary landfill in ASINORLU, the existing dumping area was improved. This activity strove to exhibit to the inhabitants the importance and effect of the improvement of the existing dumping area by cleaning the area previously left untended. As a result, the introduction of a new sanitary landfill became easier as the inhabitants rapidly came to agreement.

Another topic was the implementation of programs to improve the living conditions of waste pickers and create a harmonious environment with the nearby neighborhood. This was done by taking into account the JICA Guidelines on Environmental and Social Considerations since the Salvadorian law does not allow waste pickers to work in sanitary landfill sites. This activity achieved its purpose and contributed to the smooth introduction of a new sanitary landfill area in ASINORLU.



## ASINORLU Landfill Site developed in the Pilot Project

### 3. Results

This project aimed beyond a single region to affect the entire country of El Salvador, and therefore it required complex formation with multiple implementation organizations, various agencies and people involved. However, despite some delays in the process of certain activities, the project progressed rather smoothly. Moreover, as the project nears its final stage, it can be said to have successfully achieved the goals that were established thanks to the enthusiastic efforts by both the El Salvadorian and Japanese sides.

### 4. Lessons Learned from the Project

There were many lessons learned through the implementation of this project such as the importance of consensus building among stakeholders in the early stage of the project, the importance of strengthening organizations of relevant agencies to the project, the effectiveness of improvement of the existing landfill sites and 3R activities, and the importance to continue holding regular meetings attended by all counterpart personnel.

Many times, the intricate formation of the project and various complications posed serious challenges, but these were met and obstacles overcome providing many valuable lessons thanks to the efforts of all people involved.

(Komei Kawauchi)

### **R'09 Twin World Congress in Davos and Nagoya for Saving CO<sub>2</sub> by Teleconferencing Technology**

The R'09 Twin World Congress (see <http://www.r2009.org/>) will take place in Davos/Switzerland and Nagoya/Japan from September 14 to 16, 2009. R'09 promotes innovative technologies and frameworks for resource management to improve material and energy efficiencies in the production, use, and recycling of materials.

The R'09 Twin World Congress is the 9th event in the bi-annual R' World Congress series started in 1993. This application-oriented scientific conference addresses



experts from science and engineering, from supply and recycling industries, from public authorities and international organizations in order to stimulate closer cooperation of the various disciplines and stakeholders across the materials life cycle. It aims to improve material and energy efficiencies in industry, including energy supply, cement and building materials, metallurgical, chemical, glass, pulp and paper, machinery, the automobile and electronic industries as well as activities of collection, sorting, further treatment and final disposal of post-consumer material. The use of Information and Communication Technologies (ICTs) are of increasing importance in resource management and will find special consideration at R'09.

The R'09 Twin World Congress is an example and an experiment in resource management: to be held simultaneously in two parts of the world – Davos Congress Center in Switzerland and Toyoda Auditorium at Nagoya University in Japan – while all plenary lectures and discussions will be shared using teleconferencing technology, this congress will avoid many intercontinental flights, which are known to account for most of the resource demand of international congresses.

R'09 Congress in Nagoya venue is hosted by Nagoya University and organized by the local steering committee in Japan with many supporting societies and sponsors including the JSWME. Parallel and poster sessions will take place using non-common time slots with some feedback to the Davos venue. Exhibitions by eco-industries, technical visits (the gasification melting furnace or landfill site in Nagoya) and optional tours in Nagoya city are also planned during the congress period. The JSWME 20th Annual Conference (on Sept. 17-19) as well as SWAPI 2009 (on Sept. 16-17) is to be held at Nagoya University following the R'09/WRF conferences.

#### Topics of Interest

- (1) Materials and Energy Technology
  - Development of Innovative Materials
  - Renewable Energy
  - Clean and Efficient Energy Conversion

- Applications of Nano- and Biotechnologies for Resource Efficiency

- Materials and Energy Efficiency in Specific Industries

- Technologies for Materials Recycling and Re-Integration

(2) Waste and Emission Management

- Green Production, Cleaner Production

- Safe and Environmentally Sound Disposal

- Future Development of Waste Generation

(3) Information and Communication Technologies

- Resource Information Systems, Resource Statistics

- Modeling and Simulation for Resource Management

- Other Applications of Information and Communication Technologies in Resource Management

- Resource Consumption of Electronics and Approaches to Green IT

(4) Political, Economic and Social Issues

- Economics and Policies for the Management of Materials, Natural Resources and Emissions

- International Trade and Policy for Resource Governance

- Life Cycle Thinking, Material Flows and Environmental Assessment

- Dematerialization and Sustainable Consumption

- The Role of Human Behavior and Education in Saving Resources

**Important Dates**

- Abstract submission deadline: Dec. 15, 2008

- Notification of acceptance: Feb. 13, 2009

- Announcement of preliminary program: Mar. 2009

- Full manuscript submission deadline: Mar. 13, 2009

- Registration deadline for authors: Mar. 13, 2009

- Announcement of final program: Aug. 2009

- R'09 Twin World Congress: Sept. Aug. 2009

The first **World Resources Forum** (WRF 2009; see <http://www.worldresourcesforum.org/>) taking place in Davos on the last day of the R'09 Congress will also be shared with the R'09 participants in Nagoya.

The World Resources Forum is an independent, international platform for debate on global resource consumption issues, advocating innovation for resource productivity. The WRF is building a bridge from the natural sciences and engineering to economics; it aims to

equip political decision makers to identify realistic policy options for sustainable growth.

The global consumption of limited natural resources is rising at a fast pace. In spite of the remarkable success attained in solving some environmental problems, today's economic and environmental policies have not been able to solve other problems which pose serious threats to the life-supporting services of nature.

The WRF aims to transcend the current political focus on climate change and to bring the broader issues of global resource consumption and resource productivity back onto the agenda. It is assembling an interdisciplinary network of scientists, engineers and economists who recognize the necessity of establishing economic principles that respect the physical properties of resources and the laws of nature. The forum aims at a consensus on the next practical steps to be taken towards a sustainable economy.

Pre-WRF is allocated in the morning session in Nagoya venue on Sept. 16, with the aim to give input to Davos in the form of a summary of the panel discussion by stakeholders relating to the national/local governments, companies, specialists, NPOs and NGOs. All people are invited to attend Pre-WRF with Japanese/English translation available.

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(Hideaki Itoh)

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Preface

***Message for avoiding “No Human Being under the Silent Spring”***

Yasushi Matsufuji

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***Symposium***

***Reports of Each International Session***

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***Reports of Mini Symposia***

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***Recycling of Biosolids to Agricultural Land – Environmental Policy in the UK-***

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**Journal of the Japan Society of  
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***Material Design of Cement for Increased Waste Usage and Reduction of CO2 Emissions***

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***Leaching Characteristics of Heavy Metals from Recycled Glass Material and Evaluation of Effect on Groundwater***

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***Study on Spontaneous Combustion of Wastes Caused by Moisture Adsorption during Storage***

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***A Study on Ability of Paper Sludge Fly Ash to Purify Acidic Heavy Metals Solutions***

Takaaki Wajima and Yasuyuki Ikegami

Current Members of JSMCWM as of February 28, 2009  
(The figures in parenthesis indicate the difference from January, 2009)

Regular Members	2,946	(0)
Students	275	(-5)
Non-Japanese Member	86	(-1)
Public Institutions	99	(0)
Supporting Members	134	(0)
Individuals of NPOs	7	(0)
<b>Total</b>	<b>3,547</b>	<b>(-6)</b>

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