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**Thinking over of “limits to growth”**

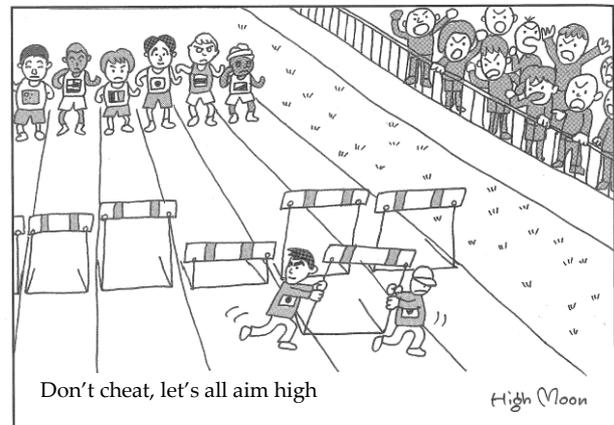
The first 3R International Scientific Conference on Material Cycles and Waste Management (3RINCs) organized by JSMCWM was successfully held in March this year, with 400 participants from 22 countries. I am sure all of the participants gained a great deal out of the conference. We are deeply indebted to the various public institutions, private companies and participants for their invaluable support. In today’s day and age, with increasing trans-border movement of resources and waste, it is essential to have a common understanding on policy making perspectives and on the findings of academic research in Asian countries that are under varying conditions and facing varying issues.

In Japan, we have been dealing with the management of disaster waste caused by the Great East Japan Earthquake and tsunami of March 2011, in addition to the normal municipal solid waste (MSW) and industrial waste. Moreover, the treatment and disposal of radioactive waste polluted by the explosion of the Fukushima nuclear power plants is an on-going and serious issue. While there is currently growing interest in energy issues in Japan, particularly in renewable energy is growing interest, it might cause an environmental trilemma. (Reducing water and atmospheric pollution causes new waste byproducts such as wastewater treatment sludge and dust from particulate matter collection equipment. The treatment of waste causes new forms of water and atmospheric pollution.) With regard to energy issues, if, for example, effort is made to eliminate nuclear energy, new forms of energy will be required, causing an increase in previously common coal-fired power production. This will cause atmospheric pollution (increased greenhouse gas emissions), leading to a

shift in industrial production to developing countries, which will then lead to atmospheric pollution issues in developing countries. While this may result in economic growth in the developing nations, demand for energy will also increase and so too will the cost of fossil fuels. Subsequently, the option of nuclear energy will come to the fore. This kind of situation is actually currently occurring.

While global circulation of resources and waste has good points, there are even greater negative points in terms of waste mileage. Waste issues and energy issues have been discussed for sustainable development but the discussions might be going around in circles. Half a century has passed since “limits to growth” was pointed out. I feel that we need to think of “limits to greed”.

(Akiko Kida)



Japan has changed its target for reducing greenhouse gases emissions by 2020, from 25% to 3%.

**ASTEM Special Session at 3RINCs 2014  
(Biomass Utilization Challenges – New  
Production Development of Biodiesel Fuel by**

It is vital for the realization of material-cycle societies to utilize biomass as a renewable source and to ensure appropriate management of biomass waste. Advanced Scientific Technology & Management Research Institute of KYOTO (ASTEM) focused its attention and supported financially this special session on biomass research, especially, concerning innovative technology and system analysis for its utilization.

At the keynote lecture of Kazuo Nakamura (ASTEM, Japan), “Overview on waste biomass utilization in Japan”, major developments of biomass policy in Japan were introduced. Furthermore, as examples, Kyoto City’s biomass utilization, biodiesel production project, experimental biogasification project and Kyoto Biocycle Project were also introduced. The Kyoto Biocycle Project was introduced as a concrete example. This is a research project on biomass utilization including woody biomass in addition to used cooking oil and kitchen garbage and other waste-derived biomass. He also presented on the progress and status of research into second generation biodiesel fuel technologies which is being carried out at ASTEM.

Following the keynote lecture, Yoshitada Takuma (Japan) outlined new conversion technology of second-generation biofuels which combines catalytic decomposition and hydrogenation in his lecture “Basic Tests on Technology for Conversion to Second-generation Biodiesel Fuel”. The next lecture was by Takumi Takasuga (Shimadzu Techno Research, Japan), “Detailed chemical analysis and evaluation of second-generation bio-diesel fuels”, highlighted analysis of the chemical components of new biofuels and gave an evaluation of such fuels.

Two lectures on the status of biomass utilization in Europe and in South Korea followed. In Europe, the numerical target for introduction of renewable energy is 20%, while excessive use of biomass-derived fertilizer should be avoided. Korea also puts emphasis on both introduction of renewable energy and security of resources; with a focus on cereals, cooking oils, woody resources and algae.

Pieter Billen & Carlo Vandecasteele of University of Leuven reported that combustion of manure to produce electricity is a promising sustainable technology as it replaces electricity production from fossil fuels, has less emission of N<sub>2</sub>O and NO<sub>x</sub> and the ash can be used as an inorganic fertilizer. The group makes every effort to solve technical problems on boiler corrosion especially by inorganic salts such as K and P. Won-Seok Yang et al of Yonsei University presented their experimental study on sawdust gasification to determine the characteristics of syngas. It was revealed that CO and H<sub>2</sub> concentrations increased as the air equivalent ratio decreases at the temperature of 1000C. Junya Yano and Shinichi Sakai of Kyoto University showed that greenhouse gas reduction could be achieved by the introduction of anaerobic digestion in energy recovery facilities when rebuilding aged incineration facilities in Japan, where 80 % of municipal solid waste was treated by

incineration.

During the discussion, there were some questions regarding the estimated cost for manufacturing second generation biodiesel fuel (BDF) and the present costs for diesel light oil. The answers were given as estimated cost for BDF manufacturing was 150 yen per liter and the present cost of diesel light oil was 100 yen per liter. Moreover, it was mentioned that the present BDF cost is rather too high and so it is necessary to develop technologies to reduce the cost. It was also mentioned that sociological importance of renewable energy should be considered.

(Kazuo Nakamura)

### Special Session on 3R Goals and its Indicators at 3RINCs 2014

In 2012, researchers from eight Asian research institutes formed a working group to study 3R policy indicators as part of the Asia Resource Circulation Research Project, a project commissioned by the Ministry of the Environment of Japan (MOEJ). The objective of the working group was to provide support for the ongoing discussions at the *Regional 3R Forum in Asia and the Pacific*, a governmental forum on international cooperation in the 3R field, on 3R goals and indicators for assessing the progress of 3R activities. By February 2014, the working group was able to propose nine 3R-related indicators at the Special Session on 3R Goals and its Indicators during the *Fifth Regional 3R Forum in Asia and the Pacific*, held at Surabaya, Indonesia.

The discussion of opportunities and approaches for implementing policy and performance indicators for the 3Rs in this Special Session built on the achievements of the working group to date. To start off, Dr. Yasuhiko Hotta, Institute for Global Environmental Strategies (IGES), briefly introduced the session objectives and background to 3R indicator assessment. Prof. Agamuthu Pariatamby, University of Malaya, presented the proposed nine indicators for the *Regional 3R Forum in Asia and the Pacific*, together with the reasons for their selection. Mr. Michikazu Kojima, Institute for Development Economies/JETRO, presented lessons learnt from existing 3R and waste management targets and indicators in East and Southeast Asia. Dr. Kosuke Kawai, National Institute for Environmental Studies, discussed the challenges of waste management data collection at the local level in developing Asian countries, and the potential for improvement. Lastly, Ms. Mariko Yamada, Corporate Environmental Strategy Unit, Fujitsu Limited, introduced their efforts to independently develop indicators to assess resource

efficiency in their ICT products and services.

Active discussions between panellists and participants followed the presentations. Major messages derived from this session are as follows.

- Defining the priority policy issue is the most important. Capacity development for target and indicator setting should follow this step.
- Target setting is indispensable for designing forward-thinking waste management policies.
- Capacity of local authorities is key for target setting. Standards and guidelines to evaluate capacity are needed for data collection purposes.
- Appropriate incentives, such as linking to eligibility for subsidies given by central government to local authorities, are necessary for the improvement of data collection and management.
- Selecting appropriate technology and getting information about appropriate facilities are essential. The collection of basic data is particularly important in ensuring a facility is not furnished without appropriate data analysis.
- Collection of data with comparable and interchangeable standards is a necessary precursor to sharing waste management and 3R experiences globally.
- Setting targets which will be an incentive is important for the popularization and spread of green products.

(Yasuhiko Hotta)

#### Upcoming events

**Global Forum on Environment:  
Promoting Sustainable Materials Management  
through Extended Producer Responsibility (EPR)  
17-19, June 2014 in Tokyo**

<http://www.oecd.org/env/waste/gfenv-extendedproducerresponsibility-june2014.htm>

**The 25th Annual Conference of JSMCWM  
15-17, September 2014 in Hiroshima**

<http://jsmcwm.or.jp/international/>

#### Material Cycles and Waste Management Research Vol.25, No.2 (March, 2014)

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Toward the Sustainable Future

*Ryoji Chubachi*

Special Issues: Toward the second amendment of the  
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Proposed Revision of Packaging Waste Recycling Act:  
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Introduction of Physics and Chemistry for Material  
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Reduction and oxidation in environment and material  
cycles: From half-cell reaction to Pourpaix diagrams  
with pH-O<sub>2</sub> plane

*Nobuhisa Watanabe*

Activity Report from the Regional Chapter

Activity Report of the Tohoku Regional Chapter

Current Members of JSMCWM as of March 31, 2014	
Regular Members	2,209
Fellow	37
Senior	30
Honorary member	3
Students	187
Public Institutions	85
Supporting companies	114
NPOs	5
Individual	15
Total	2,685

#### NEWSLETTER NO.87, June, 2014

Published by: Akiko Kida, President,  
Japan Society of Material Cycles and Waste Management  
Edited by: Prof. Shin-ichi Sakai, Chairman,  
International Relations Committee  
Edited and design by: Misuzu Asari,  
Tsunako Matsumoto and Yuko Aoki  
Translation & proofreading: James McLean  
Buzen-ya Bldg. Shiba 5-1-9, Minato-Ku, Tokyo 108-0014,  
Japan

Phone: (+81) 3-3769-5099

Fax: (+81) 3-3769-1492

<http://jsmcwm.or.jp/international/>

e-mail: [international@jsmcwm.or.jp](mailto:international@jsmcwm.or.jp)

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