

5th Edition

3RINCs 2019

The 3R International Scientific Conference
on Material Cycles and Waste Management

27 Feb - 1 Mar 2019

Bangkok, Thailand



Venue: Pullman Bangkok King Power

PROGRAM SCHEDULE

27 February 2019, Wednesday

09.00-09.30	<i>Opening & Plenary Session (Infinity Ball Room)</i>			
09.30-10.00	<ul style="list-style-type: none"> Opening remarks: Prof. Toshiaki Yoshioka (President of JSMCWM) and Prof. Seung Whee Rhee (President of KSWM) 			
10.00-10.30	<ul style="list-style-type: none"> Opening ceremony and Introductory Speech on Thailand's 3R policy (DG, PCD) Keynote-Thailand: 3Rs Implementation in Thailand: from policy to practice (President, SWAT) Keynote-International: Waste Resources and Waste to Energy in Korea (Prof. Jinwon Park, Yonsei University) 			
10.30-10.50	COFFEE/TEA BREAK			
10.50-12.10	<i>Special Session 1: WtE Experience in Thailand (Infinity Ball Room)</i>	<i>Session 1: 3R and SDG Policies (Alfa Room)</i>	<i>Session 2: Characterization of Industrial and Hazardous Waste (Beta Room)</i>	<i>Session 3: Characterization and Valorisation of Organic Waste (Delta Room)</i>
12.10-13.10	LUNCH BREAK			
13.10-14.30	<i>Special Session 2: Disaster Waste Management (Infinity Ball Room)</i>	<i>Session 4: Case studies of Promotion of 3R and SDGs (Alfa Room)</i>	<i>Session 5: Practices of Industrial and Hazardous Waste Management (Beta Room)</i>	<i>Session 6: Biological Treatment of MSW (Delta Room)</i>
14.30-15.30	BUSINESS SESSION & COFFEE/TEA BREAK			
15.30-17.10	<i>Special Session 3: 3R Policy Indicator and Its Future (Infinity Ball Room)</i>	<i>Session 7: Challenges for Appropriate Waste Management (Alfa Room)</i>	<i>Session 8: Recovery Process on Industrial and Hazardous Waste (Beta Room)</i>	<i>Session 9: Waste Landfill & Disposal (Delta Room)</i>
17.10-18.00	POSTER SESSION			
18.00-20.00	Cocktail Reception (Déjà Vu Room, 2 nd Floor)			

28 February 2019, Thursday

09.00-09.30	Keynote: History and Lessons Learned on the Management of Waste Contaminated by Radioactive Substances released by Nuclear Power Plant Accident in Fukushima (Dr. Masahiro Osako) (<i>Infinity Ball Room</i>)			
09.30-10.50	<i>Special Session 4: CCTE's Waste Management Guideline Development (Infinity Ball Room)</i>	<i>Session 10: Environmental Safety of Thermal Treatment and Waste to Energy Facilities (Alfa Room)</i>	<i>Session 11: E-waste Recycling & Management (Beta Room)</i>	
10.50-11.10	COFFEE/TEA BREAK			
11.10-12.00	POSTER SESSION			
12.00-13.00	LUNCH BREAK			
13.00-14.40	<i>Session 14: Trade Restriction on Recyclable Waste and Recycling in Asia (Infinity Ball Room)</i>	<i>Session 12: Development of Thermal Treatment and Waste to Energy Technologies (Alfa Room)</i>	<i>Session 13: Life Cycle Assessment and Other Assessment Tools (Beta Room)</i>	
14.40-15.40	BUSINESS SESSION & COFFEE/TEA BREAK			
15.40-17.10	<i>Special Session 5: Plastic Materials Cycles & their Management (Infinity Ball Room)</i>			
17.10-17.30	<i>Closing Session (Infinity Ball Room)</i>			
17.30-20.00	Move to Chao Phraya River by Bus & River Cruise Dinner in Chao Phraya River			

1 March 2019, Friday

09.00-17.00	Technical Tour
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Remark: The organizer reserves the right to change the speaker schedule without prior notification due to unavoidable circumstances. All presentations will be in ENGLISH only.

Session 1: 3R and SDG Policies

*Chairperson: Dr. Masahiro Osako
Dr. Sirintornthep Towprayoon*

Design for a circular economy - some comments about implementing a successful concept

Heinz-Georg Baum, Fulda University of Applied Sciences, Germany

Optimizing integrated solid waste management system for a tourism destination in Hoi An city, Vietnam: A sustainability approach

Song Toan Pham Phu, Okayama University, Japan

Effect measurement of waste separation at source program in Da Nang city, Vietnam

TRAN Vu Chi Mai, Okayama University, Japan

Time series change of municipal waste management flows in Austria

Rokuta Inaba, National Institute for Environmental Studies, Japan

Session 2 : Characterization of Industrial and Hazardous Waste

*Chairperson: Dr. Chart Chiemchaisri
Dr. Suwanna Kitpati Boontanon*

Estimation on hazardous characteristics of the components from spent linear LED lamps

Seung-Whee Rhee, Kyonggi University, Korea

Content and sources of metals in incinerated industrial waste

Masahiro Oguchi, National Institute for Environmental Studies, Japan

Emission of polychlorinated biphenyls (PCB) from PCB waste storage sites

Yasuhiro Hirai, Kyoto University, Japan

Global management of construction and demolition and disaster waste

Agamuthu Pariathamby, University of Malaya, Malaysia

Session 3: Characterization and Valorisation of Organic Waste

*Chairperson: Dr. Satoru Ochiai
Dr. Achara Ussawarujikulchai*

Characterization of oil palm waste products

Bence Babinszki, Hungarian Academy of Sciences, Hungary

Composition of the liquid phase products of rape straw formed during torrefaction

Zoltán Sebestyén, Hungarian Academy of Sciences, Hungary

The chemical effects of torrefaction of biomass and its impact on enzymatic hydrolysis

Zsuzsanna Czégény, Hungarian Academy of Sciences, Hungary

Utilization of organic municipal solid waste in the production of tiles

Vo Dinh Long, Industrial University of Ho Chi Minh City, Vietnam

Session 4: Case Studies of Promotion of 3R and SDGs

*Chairperson: Prof. Heinz-Georg Baum
Dr. Chalor Jarusuthirak*

International comparison on attitudes towards food wastage

Kohei Watanabe, Teikyo University, Japan

Review on current state of CDW management in Southeast Asian countries

Han Hoang, National Institute for Environmental Studies, Japan

The role of the MRF in Indonesia's waste management system (Case Study of the "Kartamantul" Territory, Special Province of Yogyakarta, Indonesia)

Hijrah Purnama Putra, Universitas Islam Indonesia, Indonesia

Present Status of marine litter management in Sri Lanka

A J M Gunasekara, Marine Environment Protection Authority, Sri Lanka

Session 5: Practices of Industrial and Hazardous Waste Management

*Chairperson: Prof. Jin Won Park
Dr. Ranjana Jindal*

Towards large-scale production of bio-succinic acid: Most promising second generation feedstocks and optimized fermentation and purification strategies

Manuel Pinelo, Technical University of Denmark, Denmark

Phosphate removal by using waste oyster shell

Thanh-Tham Tran, Taiwan Tech (NTUST), Taiwan

A waste composition survey of spray cans and cassette cylinder from households in Kyoto

Junya Yano, Kyoto University, Japan

Environmental impact of hazardous waste disposal at a cement plant in India – A case study of acid tar sludge trial

Rahul Baidya, Jadavpur University, India

Session 6: Biological Treatment of MSW

Chairperson: *Dr. Rokuta Inaba*

Dr. Wilai Chiemchaisri

Oxygen profiles in waste pile by biological reaction during bio-drying process in tropical Asia

Satoru Ochiai, Hokkaido University, Japan

Effect of air suction variation on pre-treated waste in bio-drying process

Panida Payomthip, King Mongkut's University of Technology Thonburi, Thailand

Methane emission from windrow typed mechanical biological treatment in tropical climate

Noppharit Sutthasil, National Institute for Environmental Studies, Japan

Assessment of municipal solid waste based biogas plants in India

Munish Kumar Chandel, Indian Institute of Technology Bombay, India

Session 7: Challenges for Appropriate Waste Management

Chairperson: *Prof. Seung Whee Rhee*

Dr. Samunya Sanguanpak

Rising the concern of marine plastic issues: How will an international regime deal with this global environmental issue?

Fusanori Iwasaki, Economic Research Institute for ASEAN and East Asia, Indonesia

Comparison of characteristics of refuse collection vehicles (RCVs) in Japan, Singapore and Europe and its recent discussion for ISO standardization

Rieko Kubota, National Institute for Environmental Studies, Japan

Fossil carbon fraction of diaper in Japan

Thet Ko Win, Kyoto University, Japan

Estimation of fossil carbon fraction in paper waste and carbon fraction in plastic waste based on a household waste composition survey

Seiya Oyama, Kyoto University, Japan

Marine plastic debris in selected islands in Malaysia: Anthropogenic activities and its impact to plastic waste abundance

Fauziah Shahul Hamid, University of Malaya, Malaysia

Session 8: Recovery Process on Industrial and Hazardous Waste

Chairperson: *Prof. Yifei Sun*

Dr. Anucha Wannagon

Regeneration of waste activated carbon disposed from mercury recovery process

Soo Jin Cho, Yonsei University, Korea

Treatment of mine waste water containing As and Fe by Mg-Al layered double hydroxide aiming at sludge volume reduction

Xinyi Yang, Tohoku University, Japan

Effect of anions on recovery of copper, nickel and water from electroplating wastewater in electro dialysis process

Eunjoo Oh, Konkuk University, Korea

A study for two-step metal carbonation CCUS process based on seawater based industrial wastewater

Injun Kim, Yonsei University, Republic of Korea

Utilization of resources in ferro alloy plant

Rajarshi Chakraborty, Guru Nanak Institute of Technology, India

Session 9: Waste Landfill & Disposal

Chairperson: *Dr. Tomonori Ishigaki*

Dr. Komsilp Wangyao

Environmental significance of heavy metal in leachate from different types of landfill in Malaysia

Kenichi Yoneda, Kawasaki City & Tokyo University of Agriculture and Technology, Japan

Arsenite sorption capabilities of landfill soils from Malaysia

Munirah Hussein, Universiti Teknologi Malaysia, Malaysia

Mitigation of methane emission from municipal solid waste landfill using biological filters with different media

Chart Chiemchaisri, Kasetsart University, Thailand

Characterisation of the fine fraction obtained from municipal solid waste dumpsite and its reclamation potential evaluation

Munish Kumar Chandel, Indian Institute of Technology, Bombay, India

Analysis of consumption and disposal of plastic products to discuss plastic waste management in Pacific Island countries

Megu Tsuchimura, Kyoto University, Japan

Session 10: Environmental Safety of Thermal Treatment and Waste to Energy Facilities

Chairperson: *Dr. Zsuzsanna Czégény*

Dr. Chinnathan Areeprasert

Control of chlorine and elemental distribution in the municipal solid waste incineration process

Shigenori Iino, Tokyo Metropolitan Research Institute for Environmental Protection, Japan

Stabilization of mercury contaminated waste - fly ash from municipal solid waste/ hospital waste incinerators

Soo-Jin Cho, Yonsei University, Korea

Preliminary study on mineralogical immobilization of heavy metals in municipal solid waste incineration fly ash

Hiroki Kitamura, National Institute for Environmental Studies, Japan

Carbon dioxide capture with utilizing heavy metal ions in municipal solid waste fly ash

Juhee Son, Yonsei University, Korea

Study on location of solid waste incineration plant with new energy recover facility in Japan

Naohiro Goto, Toyo University, Japan

Session 11: E-Waste Recycling & Management

Chairperson: *Dr. Masahiro Oguchi*

Dr. Nuttakan Nitayapat

Recovery of bisphenol A from discarded mobile phone

Trung Hai Huynh, Hanoi University of Science and Technology, Vietnam

Estimation of material volume from discarded large home appliances

Duc Quang Nguyen, Hanoi University of Science and Technology, Vietnam

Bioleaching for the recovery of Au and Ag from electronic waste facilitated by metal resistant heterotrophic bacteria

Minimol M., National Institute of Technology Karnataka, India

Inhalation bioaccessible concentration and bioaccessibility of flame retardants in floor dust from E-waste processing workshop in northern Vietnam

Tatiya Wannomai, Tokyo Institute of Technology, Japan

Recovery of Indium from extractant solutions of waste Indium Tin Oxide (ITO) by aluminum cementation

Jenni Lie, Taiwan Tech (NTUST), Taiwan

Session 12: Development of Thermal Treatment and Waste to Energy

Chairperson: *Prof. Katsuya Kawamoto*

Dr. Pruk Aggarangsi

Coupling of incineration waste bed modelling and freeboard computational fluid dynamics simulation – A bed model sensitivity study

Adrian C. H. Lai, Nanyang Technological University, Singapore

Pyrolysis characteristics of sewage sludge for efficient recycling and energy recovery

Gun-Ho Han, Yonsei University, South Korea

H₂-rich syngas recovery and HCN removal via catalytic reforming of product gas from thermal degradation of polyurethanes over Ni/Mg/Al catalyst

Shogo Kumagai, Tohoku University, Japan

Nano-carbon fiber synthesized in waste plastic gasification process and application as composite material

Takashi Amemiya, Nippon Institute of Technology, Japan

Development and optimization of pilot-scale rotary kiln combustor for municipal solid waste incineration

Chelladurai Punithan, Indian Institute of Technology Madras, India

Session 13: Life Cycle Assessment and Other Assessment Tools

Chairperson: *Prof. Shabbir H. Gheewala*

Dr. Trakam Prapapongsa

Waste input-output analysis of prefectures in Japan to promote sound material cycles by using data in official reports collected for waste management

Yasushi Kondo, Waseda University, Japan

Application of material flow analysis and water quality modelling to facilitate of leachate management system

Tengku Nilan Baizura, University of Malaya, Malaysia

Municipal solid waste material flow in Bali province, Indonesia

Elprida Agustina, Bandung Institute of Technology, Indonesia

Perceptive classification of combustible waste mixture: A Case survey in Japan

Nattapon Leeabai, Tokyo Institute of Technology, Japan

Flows, stocks, and generating factors of spray cans and cassette cylinders

Toshiyuki Tsunemitsu, Kyoto University, Japan

Session 14: Trade Restriction on Recyclable Waste and Recycling in Asia

Chairperson: Dr. Michikazu Kojima

The Background and the Impact of China's Import Restrictions of Recyclable Waste since 2017

Aya Yoshida, National Institute for Environmental Studies, Japan

Impact on Chinese Import Restriction on Recyclable Waste for Southeast Asian Countries

*Dian Lutfiana, Economic Research Institute for ASEAN and East Asia (ERIA), Indonesia
Hikaru Shirai, Kyoto University, Japan
Michikazu Kojima, ERIA, Indonesia*

Current Status and Issues of Recyclable Waste Trade in Thailand

So Sasaki, Chulalongkorn University, Thailand

Impact of Chinese Restriction Recyclable Waste in India

Amit Jain, IRG Systems South Asia Pvt. Ltd, India

Special Session 1: WtE Experience in Thailand

Chairperson: Prof. So Sasaki

Current status and issues of WtE projects in Thailand

So Sasaki, Chulalongkorn University, Thailand

Waste to energy in Phuket

Tavorn Jirapattanasopon, Phuket City Municipality, Thailand

Major challenges in development and implementation of WtE projects in Thailand

Patarapol Tularak, Solid Waste Management Association (Thailand), Thailand

Essence of waste management facility development & support by the consultant: from example of incineration facility in Japan

Taisuke Odera, Eight-Japan Engineering Consultants Inc., Japan

Special Session 2: Disaster Waste Management

*Chairperson: Prof. Toshiaki Yoshioka
Prof. Sdhan K. Ghosh*

Introduction of the session and disaster waste management guideline

Misuzu Asari, Kyoto University, Japan

Development of regional disaster waste management guideline in the Pacific

Faafetai Sagapolutele, J-PRISM-II, JICA

Disaster Waste Management (tentative)

Nelson Anaia, MECDMM, Solomon Islands

Future prospective of "Disaster Waste Management in Indonesia"

Tunjung Puitika, Ministry of Environment and Forestry, Indonesia

Generation and characteristics of disaster waste in Indonesia

Maryono, Diponegoro University, Indonesia

Development of disaster waste management plan and policies in Nepal

Sumitra Amataya, LEAD, Nepal

International cooperation and dissemination of disaster waste management guidelines

Mahesh Pradhan, UNEP

Special Session 3: 3R Policy Indicator and Its Future

Chairperson: Prof. Shinichi Sakai

Prof. Agamuthu Pariathamby

SDG 11 (city) and 12 (sustainable consumption and production) and regional 3R forum in Asia and the Pacific: How to accelerate implementation of SDGs in Asia and the Pacific region

Choudhury Rudra Charan Mohanty, UN Centre for Regional Development (UNCRD)

1st state of the 3Rs in Asia and the Pacific report

Yasuhiko Hotta, Institute for Global Environmental Strategies, Japan

Challenges and possible future priorities for science and database for 3R policy assessment at regional level

Chen Liu, Institute for Global Environmental Strategies, Japan

Implementing 3R indicators in Pacific Island countries

Ma Bella Buinto, SPREP

Recapping 1st round and priorities for 2nd round

*Shinichi Sakai, Kyoto University, Japan
Agamuthu Pariathamby, University of Malaya, Malaysia*

Special Session 4: CCETs Waste Management Guidelines Development

Chairperson: Dr. Yasuhiko Hotta

Challenges and key factors in advancing environmentally sound management of waste in Asia and the Pacific

Shunichi Honda, UNEP

Introduction of the CCET and waste management guidelines activity

Kazunobu Onogawa, CCET

Development of the framework of CCET Guideline Series on MSWM

Chen Liu, IGES, Japan

Guideline Development on Mechanical Biological Treatment (MBT)

Tomonori Ishigaki, NIES, Japan

Guideline Development on Anaerobic Digestion for MSWM

Andante Hadi Pandyaswargo, Waseda University, Japan

Guideline Development on Waste-to-Energy from MSW incineration

Katsuya Kawamoto, Okayama University, Japan

Special Session 5: Plastic Materials Cycles & their Management

Chairperson: Prof. Toshiaki Yoshioka

Status of Marine Plastic Debris: Issues, Challenges and Global Initiatives

Agamuthu Pariatamby, University of Malaya, Malaysia

3Rs Policy and plastic waste management in Thailand

O. Chavalparit, Chulalongkorn University, Thailand

3R plus concept for plastic materials management

Shinichi Sakai, Kyoto University & MOEJ, Japan

3R challenges and experiences on plastic containers and packages

Yoshinori Suga, Embassy of Japan, Thailand

Marine Plastic Debris Status in Indonesia

Reza Cordova, Indonesian Institute of Sciences, Indonesia

Comparative Analysis of Plastic Waste Management and Circular Economy Policy in ASEAN Countries

Yasuhiko Hotta & Magnus Bengtsson, IGES, Japan

Poster Session

Selective separation of landfill gas using hydroquinone clathrates

Dongwon Lee, Kongju National University, Korea

Electrochemical behavior of tungsten carbide-cobalt alloy using molten hydroxide under low temperature condition

Phengxay Deevanhxay, National University of Laos, Lao PDR

A study on TiO₂-coated cenospheres for photocatalytic performance

Jeun Jeong, Kongju National University, Korea

Effective capture of cesium iodide (CsI) by aluminosilicate sorbents for the treatment of radioactive gas from spent nuclear fuel

Jae Hwan Yang, Chungnam National University, Korea

Separation of syngas (CO and H₂) using polyamide composite membrane

Jeeban Poudel, Kongju National University, Korea

Catalytic steam reforming of toluene in a DBD plasma reactor over SiO₂ and ZSM-5 supported Fe-based catalysts

Yifei Sun, Beihang University, China

Influence of temperature on syngas production from pyrolysis of anaerobically digested sludge

Gabin Kim, Konkuk University, Korea

Potentiality of in-house treatment for Khartoum state medical wastes

Nagwa Fadl Bashir, Zamzam University College, Sudan

Adsorption selectivity against zinc of amine modified mesoporous silica with different pore size

Tatsuo Nishihama, Nagoya University, Japan

Greenhouse gas emission from two-stage membrane bioreactor treating municipal solid waste leachate

Chart Chiemchaisri, Kasetsart University, Thailand

Preparation of magnetic BEA-type zeolite via dry-gel conversion method

Vanseng Chounlamany, National University of Laos, Lao PDR

Kofu-kyoto waste to energy plant stable operation record of fluidized-bed gasification and melting furnace

Koki Yamashita, KOBELCO Eco-Solutions, Japan

Investigation on formation of methane hydrate at moderate conditions for energy storage

Yuki Kamimoto, Nagoya University, Japan

Effect of pH in mercury re-emission

Doah Kim, Chungbuk National University, Korea

Flow characteristics in an electrostatic precipitator with fan operation time

Dong-uk Kim, Chungbuk National University, Korea

Flow Characteristics in an electrostatic precipitator at different environment

Dong-uk Kim, Chungbuk National University, Korea

Recovery of decane using vacuum swing adsorption

Jeongmin Park, Chungbuk National University, Korea

Mercury analysis for the adsorption of commercial activated carbon

Sinang Choi, Chungbuk National University, Korea

Mercury analysis for the adsorption of prepared activated carbon

Sinang Choi, Chungbuk National University, Korea

Evaluation of different sewage sludges as a potential of biodiesel source

Febrian Rizkianto, Kyoto University, Japan

The relationship between businesses' handled amount and released/transferred amount of chemical substances according to the PRTR system

Satoshi Mizutani, Osaka City University, Japan

Pyrolysis characteristics of biomass and marine waste buoys mixture by thermogravimetric analysis

Soyoung Han, Korea Institute Machinery & Materials, Korea

Immobilization of toxic metals in MSWI fly ash by geopolymerization using incinerator bottom ash

Yuma Kawasaki, Kyoto University, Japan

Characteristics of municipal solid waste as a source of SRF (Solid Refuse Fuel) generated From Daejeon metropolitan city, Korea

Hongkyoung Kim, Chungnam National University, Korea

An efficient treatment of mixed plastic wastes by SRF and pyrolysis process

Hae Seung Lee, Gangwon State University, Korea

Enhancement of FOG biodegradation using bio-augmentation of Pseudomonas Putida in co-digestion of grease trap waste and excess MBR sludge

Wilai Chiemchaisri, Kasetsart University, Thailand

Mass balance of heavy metals in one closed landfill site for incinerator residues in Japan

Yiqun Xiong, Kyoto University, Japan

CO₂ utilization using metal cation in seawater-based industrial wastewater

Dongwoo Kang, Yonsei University, Korea

Thermal destruction of Br-based compounds by monitoring of CO and mineralized Br

Shodai Tagushi, Osaka Institute of Technology, Japan

Lipid removal efficiency of bacteria isolated from wastewater in Khlong Hok area, Pathum Thani Province

Jantima Teeka, Rajamangala University of Technology Thanyaburi, Thailand

Evaluation of the geotechnical characteristics of waste disposal site in Thailand by the surface wave exploration

Shuichi Nagaoka, Japan Environmental Sanitation Center, Japan

Reduction in the amount of electricity generated by changes in breeding method of daily cows to free stalls on biogas production

Hitoshi Ogawa, Tamagawa University Research Institute, Japan

Mechanical and structural properties for recycled thermoplastics

Tsukasa Sato, National Institute of Technology, Tsuruoka College, Japan

Treatment of grease trap waste using bioaugmentation of yeast pure culture

Wilai Chiemchaisri, Kasetsart University, Thailand

A study on the environmental assessment of the closure and postclosure landfill in Korea

Sangkeun Kim, Korea Institute of Construction Technology, Korea

Separation of Cl from vaporized KCl during its condensation

Kohei Saito, Osaka Institute of Technology, Japan

The catalyst properties for the high temperature water gas shift reaction depending on the concentration of precursor

Dae-Woon Jeong, Changwon National University,
Korea

**A new method for the recovery of high purity
copper from plating wastes**

Han S. Kim, Konkuk University, Korea

**Identification of residual sludge due to high
concentrations of Fe & Mn contained in bank
filtrate**

Daeyoung Kwon, Inje University, Korea

**A study of HBCD levels and flow of products
and waste materials in Korea**

Yeji Jang, Chungnam National University, Korea

**Recycling and greenhouse gas reduction of used
glass bottles by EPR in Korea**

Yuree Kwon, Chungnam National University,
Korea



Organizer

- Solid Waste Management Association -Thailand (SWAT)

Co-Organizers

- Pollution Control Department (PCD), Ministry of Natural Resources and Environment, Thailand
- Japan Society of Material Cycles and Waste Management (JSMCWM)
- Korean Society of Waste Management (KSWM)

Supporters

- UNCRD (United Nations Centre for Regional Development)
- UN Environment-IETC (United Nations Environment Programme – International Environmental Technology Centre)
- ISWA (International Solid Waste Association),
- IGES (Institute for Global Environmental Strategies),
- JESC (Japan Environment Sanitation Center),
- WMF (Japan Industrial Waste Management Foundation),
- JW (Japan Industrial Waste Information Center) and other organizations