



EcoBalance 2010

The 9th International Conference on EcoBalance
Towards & Beyond 2020

November 9-12, 2010

National Museum of Emerging Science and Innovation (Miraikan), Tokyo, Japan

Proceedings

Organized by



The Institute of Life Cycle Assessment, Japan

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Ecomaterials Forum



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Preface

Towards & Beyond 2020

For a sustainable future, we now need to decide what must be done over the next decade. Certain decisions may cause massive damage to the environment, or have negative socio-economic impacts on distant countries. Hence, we have to make decisions carefully by not only focusing on the immediate interests but also considering the indirect impacts on both distant places and the future. That is to say, it is important for us to make decisions based on life cycle thinking that takes various trade-offs into account.

The International Conference on EcoBalance began in 1994 to deal with life cycle assessment (LCA), and has since developed over the years as a forum to discuss the development and applications of methods for sustainability based on life cycle thinking. To date, the conference has attracted many participants from all over the world working in academia, industry and government.

The purpose of EcoBalance 2010 (The 9th International Conference on EcoBalance) is to discuss problems and solutions in various fields such as energy, resources, food, water, transportation, consumer life etc. to clarify what we must do towards and beyond 2020 to ensure a sustainable future.

This volume contains the papers presented at EcoBalance 2010 in Tokyo, Japan, from November 9 to 12, 2010. I believe that this volume serves as a significant source to provide the latest findings in LCA and related fields, and makes a fruitful contribution to designing our sustainable future.

Finally, I wish to thank all the members of the International Advisory Committee and the Executive Committee, as well as many colleagues and organizations, who contributed to the success of the Conference in various ways.



Hiroki HONDO

Chair of the Executive Committee of EcoBalance 2010

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(In alphabetical order)

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EcoBalance 2010 Program

Room A : Mirai CAN Hall Room B : Innovation Hall Room C : Conference room 2 Room D : Conference room 1 Room E : Conference room 3 *[S-] : Special Session

Room A	Room B	Room C	Room D
9th Nov.			
18:00-20:00	Welcome Party (Room E)		
10th Nov.			
10:00-12:00	Keynote 1 How Should We Shape Our Future? Beyond a Low-Carbon Society Shinji TARUTOKO (A member of the House of Representatives) Keynote 2 Chemical Risk Management Considering Greenhouse Effect Junko NAKANISHI (National Institute of Advanced Industrial Science and Technology)	Opening and Plenary (Room A)	
12:00-13:30	Lunch		
13:30-14:50	*[S-1] <u>Sustainable Management of Agricultural and Biomass Resources Using the Life Cycle Approach (1)</u>	<u>Theory and Practice on Supply Chain Analysis</u>	<u>Resource and Environment in Asia (1)</u> *[S-3] <u>Advances of Knowledge for Assessing Water Resource Use and Consumption in LCA</u>
14:50-15:10	Break		
15:10-16:30	*[S-1] <u>Sustainable Management of Agricultural and Biomass Resources Using the Life Cycle Approach (2)</u>	<u>Design for Sustainable Transport</u>	*[S-4] <u>Decoupling Environmental Impact and Resource Use from Economic Growth in Asia (1)</u> <u>Lifestyle and Consumption</u>
16:30-16:50	Break		
16:50-18:10	*[S-1] <u>Sustainable Management of Agricultural and Biomass Resources Using the Life Cycle Approach (3)</u>	<u>Life Cycle Thinking on Building</u>	*[S-4] <u>Decoupling Environmental Impact and Resource Use from Economic Growth in Asia (2)</u> <u>International Trade and Waste Management Issue</u>
11th Nov.			
9:00-10:20	*[S-1] <u>Sustainable Management of Agricultural and Biomass Resources Using the Life Cycle Approach (4)</u>	*[S-7] <u>Applications of LCA to New-technology Innovation (1)</u>	*[S-2] <u>Sustainable Mining from Natural and Urban Reserves (1)</u> <u>Resource and Environment in Asia (2)</u>
10:20-10:40	Break		
10:40-12:00	*[S-1] <u>Sustainable Management of Agricultural and Biomass Resources Using the Life Cycle Approach (5)</u>	*[S-7] <u>Applications of LCA to New-technology Innovation (2)</u>	*[S-2] <u>Sustainable Mining from Natural and Urban Reserves (2)</u> <u>New Topics in LCA Database (1)</u>
12:00-13:30	Lunch		
13:30-14:30	Poster Session A		
14:30-14:50	Break		
14:50-16:30	*[S-1] <u>Sustainable Management of Agricultural and Biomass Resources Using the Life Cycle Approach (6)</u>	<u>Carbon Resource Management in Energy System</u>	*[S-2] <u>Sustainable Mining from Natural and Urban Reserves (3)</u> <u>New Topics in LCA Database (2)</u>
16:30-16:50	Break		
16:50-17:50	Poster Session B		
18:30-20:30	Banquet at 'GRAND PACIFIC LE DAIBA'		
12th Nov.			
10:00-12:00	*[S-5] <u>Index and Methods to Assess Socio-economic Impacts and Sustainability</u>	<u>New Topics in LCA Database (3)</u>	*[S-8] <u>Materials for Raising Environmental Consciousness of Consumers and Promoting Environmental Practices of Consumers (1)</u> *[S-6] <u>International Standardization of Environmental Management Accounting</u>
12:00-13:30	Lunch		
13:30-15:10	*[S-7] <u>Applications of LCA to New-technology innovation (3)</u>	<u>Environmental Education for Life Cycle Thinking</u>	*[S-8] <u>Materials for Raising Environmental Consciousness of Consumers and Promoting Environmental Practices of Consumers (2)</u> <u>Risk Assessment and Management</u>
15:20-16:00	Closing (Room A)		
16:10-16:50	Farewell Party (Room E)		

Plenary Session

November 10, 2010 10:30-12:00 (Room A)

Chair : Hiroki HONDO

Keynote 1

How Should We Shape Our Future? Beyond a Low-Carbon Society

Shinji TARUTOKO, Makoto YAMAZAKI

Keynote 2

Chemical Risk Management Considering Greenhouse Effect

Junko NAKANISHI

Oral Session

Special Session 1 (Room A) November 10, 2010 13:30-14:50

Sustainable Management of Agricultural and Biomass Resources Using the Life Cycle Approach (1)

Chair : Kiyotada HAYASHI, Masanori SAITO

A1-1330 (Invited) 13:30-13:50

Rebound Effects of Biofuel Production in LCA

Roland Werner SCHOLZ, Bastien GIROD

A1-1350 13:50-14:10

Food, Feed, Fuel, Forest or Carbon Sink: Can LCA Provide Guidance on How to Best Use Land?

Miguel BRANDÃO

A1-1410 (Invited) 14:10-14:30

Land Use Assessment of Biofuel Feedstock Cultivation in Japan

Tabea BECK, Bastian WITTSTOCK, Kiyotada HAYASHI, Ulrike BOS, Takeshi OTA, Susumu UCHIDA

A1-1430 14:30-14:50

A Scenario-based Assessment of Regional Biomass Utilization Using the Life Cycle Approach: A Case Study on Biorefinery Systems Founded on Sweet Potatoes in Southern Kyushu

Susumu UCHIDA, Kiyotada HAYASHI, Teruo WATANABE, Ryo SUGIURA

Special Session 1 (Room A) November 10, 2010 15:10-16:30

Sustainable Management of Agricultural and Biomass Resources Using the Life Cycle Approach (2)

Chair : Shabbir H. GHEEWALA

A1-1510 (Invited) 15:10-15:30

The Environmental and Social Impacts of Biofuels Production: Total Cost Assessment of Biomass Utilization Trials in Japan

Lise LAURIN, Kiyotada HAYASHI, Susumu UCHIDA

A1-1530 15:30-15:50

Life Cycle Assessment of an Aged Red Wine from a Familiar Cellar in Catalonia, Spain

Niklas VON DER ASSEN, Montse MENESSES, Francesc CASTELLS, JC PASQUALINO

A1-1550 15:50-16:10

Environmental Evaluation by Means of LCA of a Renewable Material Product: The Natural Cork Stopper

Jesus RIVES, Joan RIERADEVALL, Xavier GABARRELL

A1-1610 (Invited) 16:10-16:30

Development of Ecological Scarcity Japan

Rolf FRISCHKNECHT, Sybille BUESSER, Kiyotada HAYASHI, Susumu UCHIDA

Oral Session

Special Session 1 (Room A) November 10, 2010 16:50-18:10

Sustainable Management of Agricultural and Biomass Resources Using the Life Cycle Approach (3)

Chair : Rolf FRISCHKNECHT

A1-1650 16:50-17:10

Non-CO₂ GHG Emission from Natural Processes in Carbon Footprint of Foods

Masanori SAITO

A1-1710 17:10-17:30

Sustainable Food Production

Johanna TELIEPS

A1-1730 17:30-17:50

Greenhouse Gas Emissions for Calculating Carbon Footprint of Sugar Production: A Case Study in Eastern Thailand

Monthira YUTTITHAM

A1-1750 17:50-18:10

Carbon Footprinting of Thai Rice Products: Practical Issues for Harmonised Methodology

Rattanawan MUNGKUNG, Ngamtip POOVARODOM, Phakaporn, Shabbir H.GHEEWALA, TANAPARISUTTI, Thitikorn CHUPAIROTE

General Session (Room B) November 10, 2010 13:30-14:50

Theory and Practice on Supply Chain Analysis

Chair : Sangwon SUH

B1-1330 13:30-13:50

Environmental Implications of China - Australia Trade: An Assessment of Embodied GHG Emissions, Energy and Pollutants

Hao TAN

B1-1350 13:50-14:10

Understanding the Drivers behind the Changing Carbon Footprint of Services: A Global, Trade-linked Analysis

Jan MINX, Baiocchi GIOVANNI, Glen PETERS, Keisuke NANSAI, Shigemi KAGAWA

B1-1410 14:10-14:30

Structural Path Analysis and Triangularization of Input-output Table for Understanding Carbon Footprint

Yasushi KONDO, Anders Hammer STRØMMAN, Shigemi KAGAWA

B1-1430 14:30-14:50

Design of Experiments to Evaluate the Impact of Sensor Embedded Products on EOL Processing

Mehmet Ali ILGIN, Surendra M. GUPTA, Kenichi NAKASHIMA

General Session (Room B) November 10, 2010 15:10-16:30

Design for Sustainable Transport

Chair : Hirokazu KATO

B1-1510 15:10-15:30

Sustainable Transport in Supply Chain Management

Raul CARLSON

B1-1530 15:30-15:50

Transformational Trucking: Double Efficiency and Sustainable Transport

Hiroko KAWAI, Amanda SAHL, Mike SIMPSON

Oral Session

B1-1550 15:50-16:10

The Role of Motor Vehicle Lifetime Extension in Climate Change Policy

Shigemi KAGAWA, Keisuke NANSAI, Klaus HUBACEK, Sangwon SUH, Jan MINX, Yuki KUDOH, Yasushi KONDO, Tomohiro TASAKI, Shinichiro NAKAMURA

B1-1610 16:10-16:30

Reduction of CO₂ and Cost-effectiveness Analysis by Future Technology of Automobile

Shuichi KANARI, Masanobu KII, Shigeru SUEHIRO

General Session (Room B) November 10, 2010 16:50-18:10

Life Cycle Thinking on Building

Chair : Erin E. MOORE

B1-1650 16:50-17:10

Case Studies in Lifecycle Building Design

Erin E. MOORE

B1-1710 17:10-17:30

The Role of LCA in the German Sustainable Building Certification

Bastian WITTSTOCK, Matthias FISCHER, Johannes KREISSIG, Anna BRAUNE, Katrin LOEWE

B1-1730 17:30-17:50

Relationship between Urban Infrastructure and Compactness for Chinese Cities

Jinling FEI, Hiroki TANIKAWA, Tao HUANG, Sradhanjali MOHANTY, Hidefumi IMURA

B1-1750 17:50-18:10

Ecological Design of Green Roofs for Sustainable Cities

C. Y. JIM

General Session (Room C) November 10, 2010 13:30-14:50

Resource and Environment in Asia (1)

Chair : Yasuhiro FUKUSHIMA

C1-1330 13:30-13:50

Analysis of Energy Consumption Structure in Suzhou, China

Haiyan ZHANG, Michinori UWASU, Keishiro HARA

C1-1350 13:50-14:10

Input-out Analysis and CO₂ Emission of Construction Sector Associated with Infrastructure Development in China

Tao HUANG, Feng SHI, Hiroki TANIKAWA, Jinling FEI, Xin TIAN, Hidefumi IMURA

C1-1410 14:10-14:30

Analysis of Energy Productivity in China

Michinori UWASU, Keishiro HARA, Haiyan ZHANG, Helmut YABAR

C1-1430 14:30-14:50

Global and Asian Material Flow and Economic Growth

Shinichiro FUJIMORI, Yuzuru MATSUOKA

Oral Session

Special Session 4 (Room C) November 10, 2010 15:10-16:30

Decoupling Environmental Impact and Resource Use from Economic Growth in Asia (1)

Chair : Keisuke NANSAI, Heinz SCHANDL

C1-1510 15:10-15:30

Greenhouse Gas (GHG) Emissions and Their Characteristics in Asia Based on National GHG Inventories

Junko AKAGI, Yukihiko NOJIRI, Akihiro TAMAI

C1-1530 (Invited) 15:30-15:50

Low Carbon Scenario and Demand for Energy Intensive Products for China in 2050

Kejun JIANG, Xing ZHUANG, Xiulian HU, Qiang LIU

C1-1550 15:50-16:10

The Green Economy Mirage ? – Assessing the Potential Environmental Impact of Low-Carbon Growth Strategies in Taiwan

Chia-Wei CHAO, Hwong-wen MA, Ming-Lung HUNG

C1-1610 16:10-16:30

Another Role for Renewables: Decoupling Regional Development and Environmental Degradation through Renewable Energy Mobilization

William Il Young BYUN, Charles FISCHL

Special Session 4 (Room C) November 10, 2010 16:50-18:10

Decoupling Environmental Impact and Resource Use from Economic Growth in Asia (2)

Chair : Seiji HASHIMOTO, Kejun JIANG

C1-1650 16:50-17:10

Resource Efficiency: Economics and Outlook for the Asia-Pacific Region

Heinz SCHANDL, Graham M. TURNER, Jim WEST, Steve KEEN

C1-1710 17:10-17:30

Evaluating Industrial Energy Efficiency and Resource Productivity on the Basis of Taiwan Economy-wide Material Flow Inventory

Guan-Lin LU, Yuh-Ming LEE

C1-1730 17:30-17:50

Municipal Waste Banking System in Thailand: Lesson Learned from Sakonnakorn Province

Suthira PUANGSIRI, Chanathip PHARINO

C1-1750 17:50-18:10

Structural Properties of Global GHG Emissions and Resource Networks Embedded in Product Supply Chain

Keisuke NANSAI, Shigemi KAGAWA, Yasushi KONDO, Kenichi NAKAJIMA, Sangwon SUH, Rokuta INABA

Special Session 3 (Room D) November 10, 2010 13:30-14:50

Advances of Knowledge for Assessing Water Resource Use and Consumption in LCA

Chair : Annette KOEHLER, Masaharu MOTOSHITA

D1-1330 (Invited) 13:30-13:50

Life-Cycle Approaches for the Water Footprint of Products: The Balancing Act between Simple Indicators and Complex Methods

Annette KOEHLER, Stephan PFISTER

Oral Session

D1-1350 13:50-14:10

Input-output Model Based Analysis of Water Consumption and Water Footprint of China 2005

Jing LIU, Katsuya NAGATA, Hiroshi ONODA

D1-1410 14:10-14:30

Damage Assessment of Water Scarcity for Agricultural Use

Masaharu MOTOSHITA, Norihiro ITSUBO, Yutaka GENCHI, Atsushi INABA

Poster Spotlight

14:30-14:50

Sara ANGRILL, Young Deuk KIM, Yuya ONO, Francesca VERONES

General Session (Room D) November 10, 2010 15:10-16:30

Lifestyle and Consumption

Chair : Kiyotaka TAHARA

D1-1510 15:10-15:30

Lifestyle and Household Consumption in Nagoya – Toward a Low Carbon Future –

Dami MOON, Hiroki TANIKAWA, Heinz SCHANDL, Liana WILLIAMS, Sonia GRAHAM, Hitomi NAKANISHI

D1-1530 15:30-15:50

CO₂ Emissions from Consumers' Daily Lives from the Viewpoint of Time Use

Tomohiko IHARA, Ryoko MOTOSE, Yuki KUDOH

D1-1550 15:50-16:10

Scenario Analysis about LC-GHG Emission of Household Food Consumption Considering Household Characteristics

Naoki YOSHIKAWA, Koji AMANO, Koji SHIMADA

D1-1610 16:10-16:30

Life Cycle Inventory Analysis about Biogasification of Household Food and Paper Waste

Takeshi MATSUDA, Junya YANO, Yasuhiro HIRAI, Shin-ichi SAKAI, Kazuo YAMADA, Mamoru OGUCHI, Hiroaki HORI

General Session (Room D) November 10, 2010 16:50-18:10

International Trade and Waste Management Issue

Chair : Paul H. BRUNNER

D1-1650 16:50-17:10

Exploring Lead Life Cycle from Inter-Country Trade

Masaaki FUSE, Kiyotaka TSUNEMI

D1-1710 17:10-17:30

Substance Flow Analysis on the Alloying Elements Associated with Steel Materials Based on WIO MFA Model

Hajime OHNO, Kazuyo MATSUBAE, Kenichi NAKAJIMA, Tetsuya NAGASAKA

D1-1730 17:30-17:50

Exploring the Benefits of Environmental Policy on Innovation and Market Behavior: The Japanese Experience in Dealing with Waste Management

Helmut YABAR, Michinori UWASU, Keishiro HARA

D1-1750 17:50-18:10

Mixed Metal Scrap in Japan and Its Export Control

Atsushi TERAZONO, Aya YOSHIDA

Oral Session

Special Session 1 (Room A) November 11, 2010 9:00-10:20

Sustainable Management of Agricultural and Biomass Resources Using the Life Cycle Approach (4)

Chair : Kazuyo MATSUBAE

A2-0900 9:00-9:20

Nutrient Recovery of the Effluent of Anaerobic Wastewater Treatment from Swine Farm by Magnesium Ammonium Phosphate Precipitation

Sutha KHAODHIAR, Ramnaree NETVICHIAN, Ampira CHAROENSAENG

A2-0920 9:20-9:40

Assessment of Nitrogen and Phosphorus Distribution from Pig Farming to Bang Pakong Basin, Thailand

Wallapa KUPKANCHANAKUL, Supaphat KWONPONGSAGOON

A2-0940 (Invited) 9:40-10:00

Design-based Calculation of Life Cycle Inventory Data (LCI) for Fertilizer Production and Comparison of Results to Other LCI

Evan M. GRIFFING, Michael OVERCASH, Kiyotada HAYASHI, Masaei SATO

A2-1000 (Invited) 10:00-10:20

Extrapolation of Potential Phosphorus Production into the Future

David A. VACCARI, Nicolay Strigul

Special Session 1 (Room A) November 11, 2010 10:40-12:00

Sustainable Management of Agricultural and Biomass Resources Using the Life Cycle Approach (5)

Chair : David VACCARI

A2-1040 (Invited) 10:40-11:00

Phosphorus Recycling for Sustainable Agriculture and Industry

Hisao OHTAKE, Masahide UEMOTO, Junpei KAGAMI, Kohsuke HONDA, Takeshi OMASA

A2-1100 11:00-11:20

WIO-MFA on Phosphorus Recovery from the Waste Materials

Kazuyo MATSUBAE, Jun KAJIYAMA, Tetsuya NAGASAKA

A2-1120 11:20-11:40

A Critical Review of Advanced Biofuels Life Cycle Analyses

Fabio Machado MENTEN, Anne PRIEUR, Jean-François BONNET, Henri BERTIN

A2-1140 11:40-12:00

A Well-to-wheel Greenhouse Gases Analysis of Cassava-based Ethanol Fuels in Thailand

Seksan PAPONG, Chantima REWLAY-NGOEN, Pomthong MALAKUL

Special Session 1 (Room A) November 11, 2010 14:50-16:30

Sustainable Management of Agricultural and Biomass Resources Using the Life Cycle Approach (6)

Chair : Yuki KUDO

A2-1450 (Invited) 14:50-15:10

Sustainable Utilization of Biomass Resources Using an Integrated Approach

Shabbir H. GHEEWALA

A2-1510 15:10-15:30

An Indication of a Carbon-Footprint of Paprika Due to the Greenhouse Facilities with an Installation of Biomass Energy System

Kiyoshi DOWAKI, Motoko YAMANARI, Yoichiro TAKADA, Jun KAMIHIRATA

Oral Session

A2-1530 15:30-15:50

Environmental Challenges When Developing Renewable Materials to Replace Non-Renewable Materials – Receiving Guidance from LCA Studies

Gunilla CLANCY, Morgan FRÖLING,
Magdalena SVANSTRÖM

A2-1550 15:50-16:10

Life Cycle Assessment of Novel Chemical Production: A Case Study of Biomass-derived Resin

Yasunori KIKUCHI, Kazuya MAYUMI,
Masahiko HIRAO

Discussion 16:10-16:30

Special Session 7 (Room B) November 11, 2010 9:00-10:20

Applications of LCA to New-technology Innovation (1)

Chair : Rokuta INABA, Yasunari MATSUNO

B2-0900 9:00-9:20

Trend Analysis of Factors to Build Material Cycle in Biomass Town Concepts

Rokuta INABA , Hidetoshi KURAMOCHI, Masahiro OSAKO, Chihiro KAYO, Keisuke NANSAI,
Seiji HASHIMOTO

B2-0920 9:20-9:40

Klimatre: Wood for a Better Climate and Higher Value Added Products

Marco IOTTI, Øyvind ERIKSEN, Knut Magnus SANDLAND

B2-0940 9:40-10:00

Assessing Resource Saving Innovations in the Forest-Based Sector Industries

Silke FEIFEL, Liselotte SCHEBEK, Witold Roger POGANIETZ

B2-1000 10:00-10:20

Environmental Impact Assessment in Consideration of Utilization Form of Products: An Example of a Paperless Meeting

Takafumi NAKAJIMA, Hiroshi ONODA, Katsuya NAGATA

Special Session 7 (Room B) November 11, 2010 10:40-12:00

Applications of LCA to New-technology Innovation (2)

Chair : Rokuta INABA, Juha KAILA

B2-1040 10:40-11:00

Life Cycle Assessment of Virtual Meeting Solutions

Fredrik GULDBRANDSSON

B2-1100 11:00-11:20

Environmental Relief Effects of Nanotechnologies by the Example of CNT Composite Materials and Films

Arnim von GLEICH, Michael STEINFELDT, Jose Luis Leon HENKLE, Morinobu ENDO, Shingo MORIMOTO,
Eishi MOMOSAKI

B2-1120 11:20-11:40

Eco-Balance of the Production Phases of Post Combustion CO₂-Capture Technologies – A Comparison

Stefanie TROY, Hermann-Josef WAGNER

..... **Program**

Oral Session

B2-1140 11:40-12:00

Value Chain Approach to WEEE Management

Maria Helena TÖRN, Johanna Elisa LAAKSONEN, Jukka Pekka HEISKANEN, Juha K. KAILA

General Session (Room B) November 11, 2010 14:50-16:30

Carbon Resource Management in Energy System

Chair : Martin BAITZ

B2-1450 14:50-15:10

Applicability of Co-evolutionary Cross-linkages in Terms of a) Environment-related Technological Innovations and b) Technology-related Built-environmental Re-designs to LCA Framework

Joy SEN

B2-1510 15:10-15:30

Research on Supply Chain Management of Photovoltaic Industry to Reduce CO₂ Emission in Global Perspective

Kotaro KAWAJIRI, Yutaka GENCHI

B2-1530 15:30-15:50

A Life Cycle Perspective on Geothermal Heat Pump Systems in Europe

Dominik SANER, Ronnie JURASKE, Markus KÜBERT, Philipp BLUM, Stefanie HELLWEG, Peter BAYER

B2-1550 15:50-16:10

Correlation Analysis on CO₂ Emission and Cost of Energy Resources and Life Cycle Assessment

Heetae KIM, Eun Chun KIM, Tae Kyu AHN

B2-1610 16:10-16:30

An Application of LCA to Clarification of CO₂ EOR as a Storage Option for CCS

Jitsopa SUEBSIRI, Malcolm WILSON

Special Session 2 (Room C) November 11, 2010 9:00-10:20

Sustainable Mining from Natural and Urban Reserves (1)

Chair : Tetsuya NAGASAKA

C2-0900 9:00-9:20

Substance Flow Analysis of Zinc Correlated with South Korean Steel Industry

Yong Soo JEONG, Kazuyo MATSUBAE-YOKOYAMA, Jong-Jin PAK, Tetsuya NAGASAKA

C2-0920 9:20-9:40

Substance Flow Analysis of Cadmium in Korea

Minjung SON, Kyounghoon CHA, Yasunari MATSUNO, Vasilis M. FTHENAKIS, Tak HUR

C2-0940 9:40-10:00

Dynamic Modeling of Cadmium Substance Flow with Zinc and Steel in Japan

Yasunari MATSUNO, Tak HUR, Vasilis FTHENAKIS

C2-1000 (Invited) 10:00-10:20

Domestic Material Flow of Zinc and Present Status of EAF Dust Management for Zinc Recovery in Taiwan

Hwong-wen MA, Kazuyo MATSUBAE, Min-Shing TSAI, Tetsuya NAGASAKA

Oral Session

Special Session 2 (Room C) November 11, 2010 10:40-12:00

Sustainable Mining from Natural and Urban Reserves (2)

Chair : Shinsuke MURAKAMI

C2-1050 10:50-11:15

Metal Mining: It's Impact to Environment and Approaches to Mitigate

Hiroshi SHIMOTORI

C2-1115 11:15-11:35

A Practical and Rigorous Methodology for Integrating Sustainable Development Principles into Decision-making Processes at Minerals Processing Operations

Daniel TUAZON

C2-1135 (Invited) 11:35-12:00

A Possibility of CRT Recycling in a Lead Smelter from an Environmental Point of View

Takashi NAKAMURA, Etsuro SHIBATA, Toshikazu SHIRATORI

Special Session 2 (Room C) November 11, 2010 14:50-16:30

Sustainable Mining from Natural and Urban Reserves (3)

Chair : Ichiro DAIGO

C2-1450 (Invited) 14:50-15:10

Hybrid Ghoshian Framework for Mapping Industrial Metal Flow Networks: with a Case Study of South Korea

Sangwon SUH, Mi Ji SHIN, Seok Do JANG

C2-1510 15:10-15:30

The Grade of Materials in Urban Mine in Terms of Total Materials Requirement ~A Comparison among Electronics, Urban Buildings and Vehicle ~

Eiji YAMASUE, Ryota MINAMINO, Kazuyo Yokoyama MATSUBAE, Masaaki FUSE, Hideyuki OKUMURA,
Keiichi N. ISHIHARA

C2-1530 15:30-15:50

Consequential MFA – A New Approach to Integrate MFA and LCA

Laura SCHNEIDER, Matthias FINKBEINER

C2-1550 15:50-16:10

Thermodynamic Evaluation for the Controllability on Recovery/Removal of Elements in Some Metallurgical Processes

Osamu TAKEDA, Takahiro MIKI, Kenichi NAKAJIMA, Kazuyo MATSUBAE-YOKOYAMA, Tetsuya NAGASAKA

C2-1610 16:10-16:30

Sustainability Index of Metals

Kohmei HALADA, Nozomu KATAGIRI

General Session (Room D) November 11, 2010 9:00-10:20

Resource and Environment in Asia (2)

Chair : Yuh-Ming LEE

D2-0900 9:00-9:20

Scenario Analysis on Zinc Recovery from Steel Making Dust in Thailand

Romchat CHAIRAKSA, Kazuyo MATSUBAE, Tetsuya NAGASAKA

D2-0920 9:20-9:40

Survey of Household Waste Generation and Willingness to Separate Waste Collection in Sri Lanka

Weranga Madhushan KAHAWE GURUGE, Takeshi FUJIWARA

Oral Session

D2-0940 9:40-10:00

A Brief Observation on Implementation of Taiwan Corporate Social Responsibility

Wang Kun CHEN, Charles Yannshi JIANG

D2-1000 10:00-10:20

Assessment of Potentially and Social Acceptance of PSF and RWHs in South-West Coastal Region of Bangladesh

Sayed Mohammad NAZIM UDDIN, Uthpal KUMAR, Md Sazzad ANSARI

General Session (Room D) November 11, 2010 10:40-12:00

New Topics in LCA Database (1)

Chair : Yutaka GENCHI

D2-1040 10:40-11:00

Lessons from Working in UNEP's Resource Panel Secretariat for Strengthening Resource Efficiency Indicators in LCA

Guido SONNEMANN, Sonia VALDIVIA

D2-1100 (Invited) 11:00-11:20

e-DEA as a Practical Design for Environment Tool

Andreas CIROTH, Michael SROCKA, Guillaume JOUANNE

D2-1120 11:20-11:40

Facilitating a Harmonisation Process Across Product Carbon Footprint Standards and PCR's

Mark GOEDKOOP

D2-1140 11:40-12:00

Data Network of the International Reference Life Cycle Data System (ILCD)

Marc-Andree WOLF, Kirana CHOMKHAMSRI, Clemens DÜPMEIER, Oliver KUSCHE, Rana PANT, David PENNINGTON

General Session (Room D) November 11, 2010 14:50-16:30

New Topics in LCA Database (2)

Chair : Mark GOEDKOOP

D2-1450 14:50-15:10

The Ecoinvent Database - Linking to the Global Market

Bo P. WEIDEMA

D2-1510 15:10-15:30

Development of Chinese Reference Life Cycle Database (CLCD)

Hongtao WANG

D2-1530 15:30-15:50

Life Cycle Inventories for Bioenergy: a German Database for Policy Support

Liselotte SCHEBEK, Andreas CIROTH, Clemens DÜPMEIER, Ludger ELTROP, Sonja SIMON, Peter VIEBAHN, Hermann-Josef WAGNER, Tobias ZSCHUNKE

D2-1550 15:50-16:10

Method Developed for Simplified Inventory-Data Estimation of Foreign-Made Products

Kensuke KOBAYASHI, Kiyotaka TAHARA, Baoren WEI

D2-1610 16:10-16:30

The Quebec National LCI Database Initiative: Database Development without Reinventing the Wheel

Pascal LESAGE

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Oral Session

Special Session 5 (Room A) November 12, 2010 10:00-12:00

Index and Methods to Assess Socio-economic Impacts and Sustainability

Chair : Andreas CIROTH, Minako HARA

A3-1000 (Invited) 10:00-10:20

Towards Life Cycle Sustainability Assessment - Integrating Social and Economic Aspects into Life Cycle Assessment

Matthias FINKBEINER, Erwin SCHAU, Marzia TRAVERSO

A3-1020 10:20-10:40

A UNEP/SETAC Tool Box for LC Sustainability Assessment of Products

Sonia VALDIVIA, Andreas CIROTH, Cassia Maria UGAYA, Bin LU, Joao FONTES, Sarah TISCHHAUSER, Guido SONNEMANN

A3-1040 10:40-11:00

Social Life Cycle Assessment of Biodiesel in South Africa: An Initial Assessment

Charles MBOHWA, Nonhlaphela MYAKA

A3-1100 11:00-11:20

Social Impact Index of ICT Services – Case Study of Videoconferences in Japan and France-

Kazue Ichino TAKAHASHI, Minako HARA, Masayuki TSUDA, Tatsuya KUNIOKA, Jiro NAKAMURA, Julien BOISSEAU, Tomoko TANAKA, Marc AUBREE, Ahmed ZEDDAM

A3-1120 11:20-11:40

Value Chain Approach to Management of Commercial and Industrial Waste

Johanna Elisa LAAKSONEN, Maria Helena TÖRN, Jukka Pekka HEISKANEN, Juha K. KAILA

A3-1140 11:40-12:00

Evaluating Return on Investment in Thermal Insulation for Houses Considering Non-Energy Benefits of Health and Well-Being

Rika EGUCHI, Toshiharu IKAGA, Shuzo MURAKAMI, Kumi OKUMURA

Special Session 7 (Room A) November 12, 2010 13:30-15:10

Applications of LCA to New-technology Innovation (3)

Chair : Matthias FINKBEINER, Yasunari MATSUNO

A3-1330 13:30-13:50

Contribution of a Technology Improvement in Greenhouse Gas Emission Reduction Considering Interactions among Corresponding Technologies under Future Circumstances

I-Ching CHEN, Yasuhiro FUKUSHIMA

A3-1350 13:50-14:10

Transition of the Global Material Cycle Induced by the Introduction of Next-generation Vehicles

Hiroki HATAYAMA, Ichiro DAIGO, Yasunari MATSUNO, Yoshihiro ADACHI

A3-1410 14:10-14:30

Batteries Management for Minimization of Electric Vehicles' Environmental Impacts in a Life Cycle Assessment Framework

Van Thanh Thuy DANG, Jerome ADNOT, Cecile FOURNIER, Stephane MOREL, Jasha OOSTERBAAN

A3-1430 14:30-14:50

Required Specifications of Plug-in Electric Vehicles for CO₂ Mitigation in Life Cycle Perspective

Yuki KUDOH, Ryoko MOTOSE

A3-1450 14:50-15:10

Inventory Analysis of CO₂ Emission over the Electric Vehicle

Mayumi ISOBE

Oral Session

General Session (Room B) November 12, 2010 10:00-12:00

New Topics in LCA Database (3)

Chair : Yoji UCHIYAMA

B3-1000 10:00-10:20

LCA Databases 2010 and Beyond – Basis to Improve Products and Services –

Martin BAITZ, Fabian HASSEL, Cecilia COLODEL

B3-1020 10:20-10:40

US Activities in Making Life Cycle Inventory Data More Available to Users

Mary Ann CURRAN

B3-1040 10:40-11:00

European Reference Life Cycle Database (ELCD)

Kirana CHOMKHAMSRI, Marc-Andree WOLF, Ugo PRETATO, Rana PANT, David PENNINGTON

B3-1100 11:00-11:20

Modeling Life Cycle Inventories for Agricultural Production and Biomass Utilization: Development of the NARO LCI Database

Kiyotada HAYASHI, Susumu UCHIDA, Shingo HOKAZONO, Masaie SATO, Yasushi FURUSHIMA, Tomokazu OHTANI, Kenichiro HADA

B3-1120 11:20-11:40

A Real-field LCA Method Using Ubiquitous information Engineering

Jae-Min CHA, Suk-Hwan SUH

B3-1140 11:40-12:00

Development of LCA Database Based on Japanese Input-output Tables and Its Application to Environmental Management

Yoshinori KOBAYASHI

General Session (Room B) November 12, 2010 13:30-15:10

Environmental Education for Life Cycle Thinking

Chair : Stephanie FARREL

B3-1330 13:30-13:50

Citizen's Consciousness, Perceived Effectiveness and Practice of Environmental Behavior

Eri AOKI, Kiyo KURISU, Jun NAKATANI, Keisuke HANAKI

B3-1350 13:50-14:10

Motivation of Japanese Citizens to Utilize International Carbon Crediting and Individual Offsetting: An Experimental Survey Offering an Actual Offsetting Opportunity

Hidenori NAKAMURA, Takaaki KATO

B3-1410 14:10-14:30

Biodiesel Production as a Framework for Sustainability and Life Cycle Thinking in an Introductory Engineering Course

Stephanie FARRELL, Johannes STROBEL

B3-1430 14:30-14:50

Socio-psychological Impacts of the Introduction of PV Systems

Hajime NODA, Hiroki HONDO

B3-1450 14:50-15:10

Life-Cycle Assessment of Material Recycling Based on Market Substitutability – A Case Study of PET Bottle Recycling –

Jun NAKATANI, Asako OKUNO, Minoru FUJII, Masahiko HIRAO

Oral Session

Special Session 8 (Room C) November 12, 2010 10:00-12:00

Materials for Raising Environmental Consciousness of Consumers and Promoting Environmental Practices of Consumers (1)

Chair : Bruno De BENEDETTI, Yoshikazu SHINOHARA

C3-1000 10:00-10:20

New Aspects of Ecomaterials

Yoshikazu SHINOHARA

C3-1020 (Invited) 10:20-10:40

Eco-materials Converted from Natural Materials

Di ZHANG, Jiajun GU, Shenming ZHU, Huilan SU, Qinglei LIU, Tongxiang FAN, Jian DING, Qixin GUO

C3-1040 (Invited) 10:40-11:00

Subjects on Fatigue Crack Generation in High Strength Alloys for Long-life Design

Osamu UMEZAWA

C3-1100 11:00-11:20

Precise Syntheses and Properties of New Bio-Based Polymers

Hideki ABE

C3-1120 11:20-11:40

Future Use of Wastes and Byproducts in the Cement Industry

Seiji HASHIMOTO, Kosuke KAWAI, Minoru FUJII, Chihiro KAYO, Rokuta INABA, Keisuke NANSAI, Tomohiro TASAKI, Masahiro OSAKO

C3-1140 11:40-12:00

Creating a New Industry Network Based on Gassification of Aquaculture Waste: Case Study for a Fishery Town in Hakodate

Atsumi FURUYA, Noritaka ASAKAWA, Motoi HIROSHIMA, Toru MATSUI, Keiichiro MOTOMATSU, Akira NAGANO, Shinichiro NAKAMURA

Special Session 8 (Room C) November 12, 2010 13:30-15:10

Materials for Raising Environmental Consciousness of Consumers and Promoting Environmental Practices of Consumers (2)

Chair : Osamu UMEZAWA, Di ZHANG

C3-1330 (Invited) 13:30-13:50

Environmental Impact when Biofuels are Used for Materials Road Transport: A Carbon Footprint Approach

Bruno De BENEDETTI, Paolo TECCHIO, Sara ROLLINO

C3-1350 13:50-14:10

Evaluation of the Global Warming Impact and Water Consumption of Shopping Bags (Plastic, Paper, Cotton): Case Study in Thailand

Jitti MUNGKALASIRI, Pornpimon BOONKUM, Thumrongrut MUNGCHAROEN, Chantana YUVANIYAMA

C3-1410 14:10-14:30

Criteria on Metals for Sustainable Materials Management in Type I Eco-Labelling System

Ichiro DAIGO, Kenichi NAKAJIMA, Takashi FUJISAKI

C3-1430 14:30-14:50

In What Extent Existing Assessment Methods and Eco-Certification of Architectural Materials Can Turn the Construction Industry Green

Eirini Renata DIMITROKALI

C3-1450 14:50-15:10

Agricultural Tourism for Eco Balance

Pardip Singh SHEHRAWAT

..... *Program*

Oral Session

Special Session 6 (Room D) November 12, 2010 10:00-12:00

International Standardization of Environmental Management Accounting

Chair : Michiyasu NAKAJIMA, Bernd WAGNER

D3-1000 (Invited) 10:00-10:20

The Role of MFCA in Coping with the Challenges of 2020

Bernd WAGNER

D3-1020 10:20-10:40

The Impacts of MFCA Management to Corporate Financial Performances

Michiyasu NAKAJIMA, Asako KIMURA

D3-1040 10:40-11:00

MFCA Management in OMRON

Toshiaki HARADA

D3-1100 11:00-11:20

MFCA Management in Sekisui Chemical

Masashi NUMATA

D3-1120 11:20-11:40

International Standardization of MFCA (ISO 14051)

Yoshikuni FURUKAWA, Hiroshi TACHIKAWA

D3-1140 11:40-12:00

Modeling of an Environmental and Economic Sustainable Business Concept

Markus MAU, Nicole MAU

General Session (Room D) November 12, 2010 13:30-15:10

Risk Assessment and Management

Chair : Masahiko HIRAO

D3-1330 13:30-13:50

Sustainable Use of Contaminated Land in Taiwan-building a Risk Assessment Foundation and Lesson Learned

Hung-The TSAI, Chih HUANG, Chih-Hsiu SHEN, Su-Shin HUNG, Yu-Jen CHUNG

D3-1350 13:50-14:10

Decision Support Tool in Design of Metal Cleaning Process Based on Life Cycle and Risk Assessments

Hiroki MATOBA, Yasunori KIKUCHI, Masahiko HIRAO

D3-1410 14:10-14:30

Risk Trade-offs between Brominated Flame Retardants and GHG Emissions from Life Cycle Perspective; Toward Sustainable Chemicals Assessment

Satoshi MANAGAKI, Yasukazu YOKOYAMA, Shigeki MASUNAGA, Yuichi MIYAKE, Takeshi KOBAYASHI, Atsumi MIYAKE, Hiroki HONDO

D3-1430 14:30-14:50

Human Exposure Assessment to Pesticides in Developing Countries: Pesticide Flow Analysis During Handed- and Motor-Pressurized Application

Camilo LESMES FABIÁN, Glenda GARCÍA-SANTOS, Claudia BINDER

D3-1450 14:50-15:10

PAHs Accumulation in the Life Cycle of Corn

Shiyong DU, Guolan FAN

Poster Session

- P-001 Sustainability of the Hydrogen Economy: A Focus on South Africa**
Junior Mabiza MA MABIZA, Charles MBOHWA
- P-002 Gaining Host Community Approval for Siting Renewable Energy Facilities**
Leighton K. CHONG
- P-003 The Blue Revolution: The Oceans as Ultimate Sustainable Resource**
Patrick K. TAKAHASHI, Leighton K. CHONG
- P-004 Life Cycle CO₂ Emissions by New Power Generation Technologies in Japan**
Ei-ichi IMAMURA, Koji NAGANO
- P-005 Environmental and Economic Evaluation for Accomplishing Food Waste Recycling Loop in Japan**
Miki TAKATA, Kazuyo FUKUSHIMA, Norio NAGAO, Chiaki NIWA, Tatsuki TODA
- P-006 The Potential for Sustainable Management of Biomass Resources in the South African Sugar Industry**
Takalani Musundwa NEMARUMANE, Charles MBOHWA
- P-007 Assessing Social Sustainability of Bio-ethanol in the South African Sugar Industry**
Janet Paidamoyo DUMA, Charles MBOHWA
- P-008 Life Cycle Assessment on Introduction of Biogas Plant in Hokkaido**
Nobuo YABE
- P-009 Development of Estimation Model for Environmental Load of Architectural Woods**
Yusuke NAMBU, Toshiharu IKAGA, Yuko TSUNETSUGU, Kensuke KOBAYASHI, Shun KAWAKUBO, Kumi OKUMURA
- P-010 Follow-up Study on Lifecycle Assessment of Bio Diesel Fuel Business Derived from Waste Cooking Oil**
Jinmei YANG, Mitsuru KAI, Takeshi FUJIWARA, Ayaka GOTO
- P-011 Soft-carbohydrate-rich Rice Straw: A Potential Raw Material for Bio-ethanol**
Takahiro ORIKASA, Ken TOKUYASU, Jeung-Yil PARK, Motohiko KONDO, Yumiko SANOH, Takashi INOUE, Koji KOJIMA, Toshikazu YANO, Poritosh ROY, Takeo SHIINA
- P-012 "Kampong Biogas"- Village Energy Independent as a Professional Firm by Poor Citizen, Case Study in Indonesia**
Rayendra ANANDIKA, Siska ADITYA, Muhammad Ibrahim ATS-TSAURI, Satwika Matahari ADYUTAWATI, WIJAYA, Nugroho Slamet WIJIYANTO, Atik MUTTAQIN
- P-013 Environmental Impact Assessment of Rapeseed Cultivation in Korea Using LCA**
Seung-Gil HONG, Joungdu SHIN, Soon-Ik KWON, Woo-Kyun PARK, Deog-Bae LEE, Jeong-Gyu KIM, Jae-Jak NAM
- P-014 Life Cycle Assessment of Bioethanol Produced from Rice Straw by Enzymatic Hydrolysis Process**
Poritosh ROY, Ken TOKUYASU, Takahiro ORIKASA, Nobutaka NAKAMURA, Takeo SHIINA
- P-015 Greenhouse Gas Mitigation Potential of Bioenergy Production: A Case Study of Biogas and Biodiesel Production in Indonesia**
Hirotugu KAMAHARA, Udin HASANUDIN, Naohiro GOTO, Hiroyuki DAIMON, Koichi FUJIE
- P-016 Inventory Analysis of Boilers Operated with Emulsified Biomass Fuel**
Kunio SATO, Takashi FUKUSHIMA, Satoshi OHTSU, Kazuaki MARUHASHI, Yukio ITO, Yuki ITO, Tadahiro YAMAGUCHI

Poster Session

- P-017 An LCA Case Study on Co-firing of Semi-carbonized Fuel Made from Thinning Woods in Coal Fired Power Plant**

Yutaka GENCHI, Tomohiro TABATA, Tsuyoshi TORIKAI, Mineo TSURUMAKI, Koji UKEGAWA

- P-018 Life Cycle Assessment of Renewable Diesel from Palm Oil: Energy and Greenhouse Gas Aspects**

Chantima REWLAY-NGOEN, Seksan PAPONG, Manit NITTHITHANAKUL, Pomthong MALAKUL

- P-019 Eco-efficiency Analysis of the Biodiesel from Used Cooking Oil: Data Envelopment Analysis**

Kanako TAKEZONO

- P-020 Integrated Life Cycle Assessment of Second Generation Bioenergy Systems: An Indian Case Study**

Joana PORTUGAL, Jun NAKATANI, Kiyo KURISU, Keisuke HANAKI

- P-021 High Valued Diversified Agriculture for Sustainable Environment**

Pardip Singh SHEHRAWAT

- P-022 Life Cycle Assessment Study on Environmental Performance of Skim Rubber Production Using Novel Technology**

Kittipoj DATCHANEEKUL, Tassaneewan CHOM-IN, Sirichai PATTANAWANIDCHAI, Chaveewan KONGKAEW, Surapich LOYKULNANT, Soottiwan NOKSA-NGA, Seksan PAPONG, Pomthong MALAKUL

- P-023 Life Cycle Assessment of Organic Soybean Production in Paddy Fields under Rotational Cropping**

Shingo HOKAZONO, Kiyotada HAYASHI, Masaei SATO

- P-024 Questionnaire Survey on the Greenhouse Gas Emissions from Feed Production System Using Food Residuals**

Tatsuo HISINUMA, Yutaka GENCHI, Akifumi OGINO, Tomoyuki KAWASHIMA, Kazunori AWAJI, Masakazu NAGAKI

- P-025 Life Cycle Assessment of Pesticides for Paddy Rice: The Relationship between Impacts of Production and Impacts of Application**

Kiyotada HAYASHI, Masaei SATO, Susumu UCHIDA, Peter FANTKE, Shanna SHAKED, Shingo HOKAZONO, Olivier JOLLIET

- P-026 Inventory Analysis of Local Lumber on Each Stage of Forestry, Manufacturing and Distribution**

Yusuke NAMBU, Toshiharu IKAGA, Shun KAWAKUBO, Kumi OKUMURA

- P-027 Phosphorus Recovering from Carbonized Sewage Sludge by Hydrothermal Processes**

Masaaki TAKAHASHI, Yukimasa TAKEMOTO

- P-028 The Effect of Rambutan Peel (*Nephelium lappaceum*) as Reducing Agent on in Vitro Methan Production within Creating Environment Friendly Farming**

Siska ADITYA, Natasha Milzandra FEMMAYROSSIE, Thoriquil Irfah ALHUDA, Fariz Ahmad FADILLAH, Tombak Mahesa BAGASKORO

- P-029 Estimation of GHG Reduction Effect Using Amino Acid for Feeds**

Susumu TSUJIMOTO, Takashi OSADA, Izuru SHINZATO

- P-030 Life Cycle Inventory Analysis of Rice Husk Use in An Giang Province, Vietnam**

Thao Thi Mai PHAM

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