

PROGRAM

Plenary Sessions

(1) Making EcoDesign Practical

Date: Dec. 9 (Tue.), 17:00 - 18:00

Place: Room A

PL-1: EcoDesign and Global Compliance: the Role of Virtual Teams

Andrew Sweatman, ESHconnect, USA



ABSTRACT :

The production and consumption of manufactured goods across regions and markets has reached a new level of complexity. At a time when products are designed in one region, manufactured in another, and then sold throughout the world, issues of environmental compliance and risk management, have become critical design considerations. Product-oriented regulations are being implemented at a rapid rate with substantial implications for design. This is presenting significant challenges for those companies eager to maintain high levels of corporate responsibility and low levels of environmental risk and impact.

Through productive collaboration with industry associations and specialist consultants, ESHconnect has successfully developed a suite of web-based tools that inform and resource companies and their product developers. Our content and methodologies, help ensure that EcoDesign becomes a robust business process that maximizes trouble-free market access. This necessarily demands an intimate knowledge of regulations that might impact on new products and their life cycle performance.

Mindful of cultural factors, legislative complexity and differing time zones, our approach involves personnel based in multiple locations around the world coming together as virtual teams to build, and deliver value-added knowledge covering EcoDesign, Product Stewardship, hazardous wastes, restricted substances, energy efficiency and environmental labelling.

The paper describes the process and experiences of establishing a global ecodesign compliance system, including the inherent socio-cultural factors, which can determine success or failure.

(2) EcoDesign and WEEE & RoHS

Date: Dec. 10 (Wed.), 13:00 - 15:30

Place: Room A

PL-2 WEEE&RoHS and Trends in the Environmental Legislation in European Union

Michelle O'Neill, Government Relations Manager Europe, Honeywell



ABSTRACT :

For over 30 years the European Union has developed a comprehensive body of environmental legislation, which has proven innovative and successful in many respects. However, a drawback has been a lack of implementation and enforcement. The imperatives to obey EU environmental law are increasing but are still not good enough. Industry and other stakeholders hope for brighter days when those who avoid complying are punished and basic regulatory tools such as business, risk and environmental impact analyses are carried out with increased vigor. The infamous WEEE and ROHS directives brought many of weaknesses of the EU environmental legislation under the spotlight but it also highlighted some new principles that are cause for optimism. Looking to the future and the enlargement of the E.U., legislators are looking at new and better ways to legislate. Industry and other stakeholders have an important role to play in providing constructive criticism. For global companies this role has gathered increasing importance as other regions around the world look to the EU as the trend setter for environmental policy.

PL-3 An Industry Vision on the Implementaion of WEEE and RoHS
Ab Stevels, Phillips, Delft University of Technology, The Netherlands



ABSTRACT :

The European Directive on Waste of Electronic and Electrical Equipment has now been approved by the European Parliament and by the Council of Member States and is now in the process of transportation into national laws. Parallel to this, terms and conditions have to be formulated on basis of which practical implementation of the legal texts should take place.

On European level a Technical Advisory Committee (TAC) consisting of representatives of Member States is operating towards this end.

In Industry, working groups of Orgalime (representing the metal and electro industry), EICTA (specifically representing the electronics industry (consumer electronics, IT and telecom)) and CECED (household appliances) are active towards this end.

In this paper the most pressing issues as regards WEEE implementation will be highlighted and solutions how to tackle these will be proposed. The basis for proposing such solutions is that the environmental intent of the WEEE should be primarily served while keeping overall costs for society as low as possible. Another basic idea is that solutions which might deviate from the current juridical framework are allowed if (better) ecological and economic performance warrant these.

Panel Discussion

Thinking EcoDesign at the Crevice of Business, Culture, and Politics --- Taking WEEE and RoHS as Examples

Panelists (tentative)

Haruhiko Yamamoto, General Manager, Technology Center, Fujitsu Limited

Terrence J. McManus, P.E. DEE, Intel Fellow, Director EHS Technologies

Michelle O'Neill, Government Relations Manager Europe, Honeywell

Ab Stevels, Phillips, Delft University of Technology, The Netherlands

Yuji Noritake, Ricoh Company

Bi Ke-Yun, Vice President, China Academy of Electronics and Information Technology

Martin Charter, the Centre for Sustainable Design, UK

(3) Significance of EcoDesign

Date: Dec. 11 (Thu.), 11:30 - 12:30

Place: Room A

PL-4 Ideas for Eco-Design Market Development: A New Evaluation Methodology

Kazutomi Mita, Chair. of Sustainable Management Forum, Japan



ABSTRACT :

Without a good rating in the market, a business cannot truly succeed long-term, even if it is an eco-business. And also, consumers have no way to make decisions about companies or goods without some tools. Therefore the rating of companies with objective criteria is needed by consumers. Companies that get good ratings can get good market share. It's the same about eco-design. So, I developed new rating system named the Mita-Model in 2000. Now SMF(SMRI) is engaging the 3-round practice to evaluate Japanese famous green companies.(80 big groups) Actually, it will be the catalyst for a sustainability dialogue and so help to realize a sustainable world.

Friendship Party

Date: December 9 (Tue.), 18:15 - 20:30

Place: Reception Hall

Ecodesign 2003 provides all attendees with the opportunity to exchange EcoDesign activities and make a friendship each others.

Special Session

Opening Ceremony

Date: December 9 (Tue.), 9:30 - 10:00

Place: Room A

Message from Organizer

Prof. Yuji Furukawa, Co-Chair of Organizing Committee

Message from METI

METI's Policy on EcoDesign – Industrial Contribution for Global Environmental Problem –

Mr. Hirotohi Kunitomo, METI

Award Presentation & Closing

Date: December 11 (Thu.), 16:30 - 17:30

Place: Room A

Award Presentation

Dr. Naoe Hosoda, Chair of Award Committee

Mr. Ryuji Era, Mitsubishi Estate Co.

Closing Remark

Prof. H. G. Greise, Co-Chair of Organizing Committee

(Awards)

Awards will be given for the best papers and the best poster presented at EcoDesign2003. Ten papers and one poster will be selected by the awards committee. Authors will receive their awards and a plaque at the EcoDesign2003 award ceremony on the 11th of Dec 2003. The plaques are made from 80 year old pine pylons that were the subterranean supports for the Marunouchi Building. The plaques were designed and made by the renowned wood artist Mr. Masayuki Ogino. This award is sponsored by Mitsubishi Estate Co. and Mitsubishi Jisho Sekkei Inc.



The recovered pine pylons at the redevelopment site of the Marunouchi Building.

Internet Room (Central Building, Room 103)

We are planning to prepare Internet connection facilities. To connect Internet, please bring your own computer and Ethernet cable (10/100 Base T). Please note that this service will not be available without notice. Also, we will prepare original prints of all the final papers of EcoDesign 2003 here instead of print service. Please come to this room if you would like to photocopy the paper(s) by yourselves.

Youth Events

– An EcoDesign Workshop “The Role of a City Park – Environment and Crime –”

Date: Dec.8 (Mon.), 13:00 - 17:00

Place: Room 401

A city park contributes to environmental improvement of its region, but there is danger of crime during the nights also.

In this workshop, there are lectures by supervisor and a researcher of a park & safety.

And we will present a field investigation result of a park in Setagaya-ku. City Park Designing will be held with participants in this workshop. This workshop is directed by 3 student parties voluntarily and supported by “EcoDesign2003”.

– Sustainable Evidence “Ecomaterial works” – Designing lifestyle for a sustainable society –

Date: Dec.8 (Mon.), 13:00 - 18:00

Place: Room 402

Considering lifestyle for a sustainable society, detailed and conceptualized products with ecomaterials and artwork will be designed and exhibited.



PRESENTATION PROGRAM

Small letters before session names represent the category of the session.

Session Categories:

- a: Sustainable Society
- b: Environmentally Conscious Business
- c: Environmentally Conscious Product & Services
- d: Environmentally Conscious Processes

Tuesday, December 9

9:30 Opening Ceremony

d: LCA for Process I

10:15	1A-1	Environmental Impacts Evaluation of Electricity Grid Mix Systems in Four Selected Countries Using A Life Cycle Assessment Point of View	29
		<i>A. Widiyanto¹, S. Kato¹, N. Maruyama¹, A. Nishimura¹, S. Sampattagul², ¹Mie Univ., Japan, ²Chiang Mai Univ., Thailand</i>	
10:40	1A-2	A Study on the Evaluation of Environmental Impacts Caused by Technology Developments	31
		<i>T. Fujiwara, R. Suwa, Y. Matsuoka, Kyoto Univ., Japan</i>	
11:05	1A-3	Balancing Design Strategies and End-of-Life Processing	33
		<i>J. Huisman¹, A. Stevels², ¹Delft Univ. of Technology, ²Philips Consumer Electronics, The Netherlands</i>	

b: Recycling Business

10:15	1B-1	An Experimental Approach to the Recycling Market	35
		<i>N. Nishino¹, S.H. Oda², K. Ueda¹, ¹The Univ. of Tokyo, ²Kyoto Sangyo Univ., Japan</i>	
10:40	1B-2	Remanufacturing in Developing Countries Concentrated at Leasing or Selling - A Case Study of Indonesia -	37
		<i>H. Hanafiah, L.-Y. Chen, H. Narita, H. Fujimoto, Nagoya Inst. of Technology, Japan</i>	
11:05	1B-3	Network Agents for Life Cycle Support of Mechanical Parts	39
		<i>H. Hiraoka, N. Iwanami, Y. Fujii, T. Seya, H. Ishizuka, Chuo Univ., Japan</i>	
11:30	1B-4	Development of the Method to Calculate Economic Benefits from the Eco-friendly Product	41
		<i>H. Hatano, Ricoh, Co., Ltd., Japan</i>	

a: Sustainable Methodologies

10:15	1C-1	A Framework for Analysing Sustainability by Using the Rewriting System	43
		<i>K. Kakimoto, T. Taura, Kobe Univ., Japan</i>	
10:40	1C-2	A Proposal for Service Modeling	45
		<i>Y. Shimomura¹, K. Watanabe¹, T. Arai¹, T. Sakao², T. Tomiyama³, ¹The Univ. of Tokyo, ²Mitsubishi Research Inst., Inc., Japan, ³Delft Univ. of Technology, The Netherlands</i>	
11:05	1C-3	A New Eco-Design Strategy to Assess Sustainable Environmental Innovations	47
		<i>S. Jofre, K. Tsunemi, T. Morioka, Osaka Univ., Japan</i>	
11:30	1C-4	Electronics Ecodesign Research Empirically Studied	49
		<i>O. Pascual, C. Boks, A. Stevels, Delft Univ. of Technology, The Netherlands</i>	

c: Life Cycle Design

10:15	1D-1	Simulation of Closed-loop Manufacturing Systems Focused on Material Balances	51
		<i>M. Soma, S. Kondoh, Y. Umeda, Tokyo Metropolitan Univ., Japan</i>	
10:40	1D-2	Product Life Cycle Design Based on Product Life Control	53
		<i>N. Sakai, G. Tanaka, Y. Shimomura, The Univ. of Tokyo, Japan</i>	
11:05	1D-3	Proposal of Decision Support Method for Life Cycle Strategy by Estimating Value and Physical Lifetimes	55
		<i>T. Daimon, S. Kondoh, Y. Umeda, Tokyo Metropolitan Univ., Japan</i>	
11:30	1D-4	Idea Generation and Risk Evaluation Methods for Life Cycle Planning	57
		<i>H. Kobayashi, Toshiba Corp., Japan</i>	

d: EcoDesign Process

11:05	1E-1	An International Study on Utilization of Design for Environment Methods (DfE) – A Pre-Study	59
		<i>M. Ernzer¹, M. Lindahl², K. Masui³, T. Sakao⁴, ¹Darmstadt Univ. of Technology, Germany, ²Univ. of Kalmar, Sweden, ³NEDO, ⁴Mitsubishi Research Inst., Japan</i>	
11:30	1E-2	Extraction of Cypress Oil and Small-sized Biomass System	61
		<i>H. Sakamoto¹, K. Amimoto¹, Y. Nishimura¹, Y. Nagahashi², J.R. Grace³, ¹Kochi Univ. of Technology, ²Kochi National Technology College, Japan, ³Univ. of British Columbia, Canada</i>	

d: LCA for Process II

13:30	1A-4	An Inspection Policy for a Stochastically Failing Single-Unit System	62
		<i>S. Okumura, N. Okino, Univ. of Shiga Prefecture, Japan</i>	
13:55	1A-5	LCA-NETS Tool for Environmental Design of Natural Gas-fired Power Generation Systems in Thailand	64
		<i>S. Sampattagul¹, S. Kato¹, T. Kiatsiriroat², N. Maruyama¹, A. Widiyanto¹, ¹Mie Univ., Japan, ²Chiang Mai Univ., Thailand</i>	
14:20	1A-6	Ecological Loss Function: Preliminary Basis for Environmental Evaluation and Design of Techniques	66
		<i>A. Halog, M. Sagisaka, A. Inaba, AIST, Japan</i>	

14:45 - 15:10 Break**d: LCA for Process III**

15:10	1A-7	Integration of CAD Models with LCA	68
		<i>H.E. Otto¹, F. Kimura¹, F. Mandorli², M. Germani², ¹The Univ. of Tokyo, Japan, ²Univ. of Ancona, Italy</i>	
15:35	1A-8	Life Cycle Assessment of Municipal Solid Waste Landfill: A Case Study in Thailand	70
		<i>W. Wanichpongpan, S.H. Gheewala, King Mongkut's Univ. of Technology Thonburi, Thailand</i>	
16:00	1A-9	On The Effect of Sorting Out Construction Byproducts in Building Construction Process	72
		<i>Y. Nachi, T. Miyazaki, Shimizu Corporation, Japan</i>	

b: LCA, EMS

13:30	1B-5	Is Environmental Management System ISO 14001 Improving Corporate Environmental Performance? Longitudinal Analysis of Manufacturing Companies in the US	74
		<i>M. Szymanski, S. Ikeda, Univ. of Tsukuba, Japan</i>	
13:55	1B-6	Towards an Operationalization of the Proposed European Directive on EcoDesign (Design for Environment) of Electronic Products (EuP)	75
		<i>A. Stevels, Philips Consumer Electronics, The Netherlands</i>	
14:20	1B-7	Measuring Implementation and Performance of Ecodesign in the Electronics Sector	77
		<i>O. Pascual, A. Stevels, C. Boks, Delft Univ. of Technology, The Netherlands</i>	
14:45	1B-8	Framework for Systematic Evaluation of Life Cycle Strategy by means of Life Cycle Simulation	79
		<i>S. Takata¹, T. Ogawa¹, Y. Umeda², T. Inamura², ¹Waseda Univ., ²Tokyo Metropolitan Univ., Japan</i>	

15:10 - 15:25 Break**15:25 - 16:45 SPECIAL SESSION: What is the next generation EcoMaterial?**

- 1. What is a target of EcoMaterials Center at National Institute for Materials Science in Japan?**
Kohmei Halada, EcoMaterials Center, National Institute for Materials Science, Japan
- 2. Nanostructured materials for environmental purification**
Hirohisa Yamada, Yujiro Watanabe, Shuichi Shimomura, Kenji Tamaura, EcoMaterials Center, National Institute for Materials Science, Japan
- 3. Vanadium-based membranes for hydrogen purification - A challenge for high performance using materials with low environmental burden -**
Chikashi Nishimura, Masao Komaki and Yi Zhang, EcoMaterials Center, National Institute for Materials Science, Japan
- 4. New Photocatalysts for Hydrogen Production and Environment Purification**
Junwang Tang, Tetsuya Kako, Zhigang Zou, Jinhua Ye, EcoMaterials Center, National Institute for Materials Science, Japan
- 5. Interconnect EcoDesign**
Naoe Hosoda and Tadatomu Suga, EcoMaterials Center, National Institute for Materials Science, Japan

6. **Development of Lead-free Solder Alloy for Flip-chip Application**
Yoshiharu Kariya, EcoMaterials Center, National Institute for Materials Science, Japan
7. **Ecomaterial applications of the fullerene nanowhiskers**
Kunichi Miyazawa, EcoMaterials Center, National Institute for Materials Science, Japan
8. **Nano structural control for energy and environmental application**
Toshiyuki MORI, Yarong WANG, Chikashi Nishimura, EcoMaterials Center, National Institute for Materials Science, Japan.
9. **Other research topics of ecomaterials**

a: Economics in Social System

- 13:30 1C-5 **A Holistic Approach to Reverse Supply Chain Planning for Remanufacturing** 81
A. Ahmed, TATA Consultancy Services Japan, Japan
- 13:55 1C-6 **A Study on the Marketability of Environmentally Friendly Refrigerators in China and Japan – I. Analysis of the Present Market** 83
P.-J. Tsai¹, S. Nagasawa², ¹Ritsumeikan Univ., ²Waseda Univ., Japan
- 14:20 1C-7 **A Study on the Marketability of Environmentally Friendly Refrigerators in China and Japan –II. Practicability of the Concept of Marketability** 85
P.-J. Tsai¹, S. Nagasawa², ¹Ritsumeikan Univ., ²Waseda Univ., Japan
- 14:45 - 15:10 **Break**

a: IT in Social System

- 15:10 1C-8 **Macroscopic Analysis of Effect of Information Communication Sector on CO₂ Emission Reduction** 87
J. Nakamura¹, T. Origuchi¹, K. Honjo¹, Y. Ibata¹, S. Nishi¹, S. Furukawa², M. Sashida², I. Hagiwara², ¹NTT Corporation, ²NTT Data Inst. of Management Consulting, Inc., Japan
- 15:35 1C-9 **Eco Design of IT Society – An Analysis of the Environmental Effects of IT Diffusion by Using a CGE Model** 89
M. Matsumoto¹, Y. Irie¹, J. Fujimoto², ¹NEC Corporation, ²The Univ. of Tokyo, Japan
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T. Kunii, R.J. Chen, IBM Japan, Ltd., Japan

c: Upgradable Design

- 13:30 1D-5 **Upgrade Planning for Upgradable Product Design** 92
A. Matsuda¹, Y. Shimomura¹, S. Kondoh², Y. Umeda², ¹The Univ. of Tokyo, ²Tokyo Metropolitan Univ., Japan
- 13:55 1D-6 **Development of a Design Methodology for Upgradability Involving Changes of Functions** 94
Y. Ishigami¹, H. Yagi¹, S. Kondoh¹, Y. Umeda¹, Y. Shimomura², M. Yoshioka³, ¹Tokyo Metropolitan Univ., ²The Univ. of Tokyo, ³Hokkaido Univ., Japan
- 14:20 - 14:45 **Break**

c: Modular Design

- 14:45 1D-7 **Universal Cellular Phone Housing for Profitable Remanufacturing** 96
G. Seliger¹, S.J. Skerlos², B. Basdere¹, M. Zettl¹, ¹Technical Univ. Berlin, Germany, ²Univ. of Michigan, USA
- 15:10 1D-8 **Life Cycle Modularity Metrics for Product Design** 98
P.J. Newcomb, D.W. Rosen, B. Bras, Georgia Inst. of Technology, USA
- 15:35 1D-9 **Modular Design Supporting System with a Step-by-Step Design Approach** 100
K. Aoyama, Y. Uno, The Univ. of Tokyo, Japan
- 16:00 1D-10 **Life Time Optimisation of Audio Systems by Modular Design** 102
A. Stevels, Philips Consumer Electronics, The Netherlands

c: Industrial Design

- 13:30 1E-3 **Dynamic Magnetic Field Analysis and Optimum Design of Small-sized Wind Power Generator** 104
H. Sakamoto¹, S. Migiwa¹, S. Nouda¹, T. Asai², ¹Kochi Univ. of Technology, ²ELF Co., Japan
- 13:55 1E-4 **Designing an Information Tool Media Concept for a Sustainable Consumption** 105
E.S. Ueda, Chiba Univ., Japan
- 14:20 1E-5 **Analysis on the Potential of Eco-Materials, from the “Design” Perspective** 107
H.H. Yanagisawa, F. Masuda, K. Suzuki, M. Suzuki, open house inc., Japan

14:45 - 15:10 Break

c: Strategy for EcoDesign Product

15:10	1E-6	Selecting Product EOL Strategy via Case-based Reasoning 109 <i>L.-H. Shih, Y.-H. Chang, National Cheng Kung Univ., Taiwan</i>
15:35	1E-7	A Study on the Trace of Appropriate Ecodesign Strategies -Applying "Instep-DfE" and "IZM-EE toolbox" on a PDA- 111 <i>J. Chung¹, H. Lee¹, A. Middendorf², K.H. Zuber², ¹Eco-Frontier Co., Korea, ²Fraunhofer IZM, Germany</i>
16:00	1E-8	Saving Product Lives in Global and Local Remanufacturing Networks: A Scientific and Commercial Work Report and an Outlook 113 <i>R. Steinhilper¹, A. Brent², ¹Univ. of Bayreuth, Germany, ²Univ. of Pretoria, South Africa</i>

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Plenary Session

17:00		Making EcoDesign Practical (see page ii)
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Wednesday, December 10

d: Process, Products, Recycle, Disassembly

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9:50	2A-2	Design for Environment in the Electronics Industry, Possibilities and Limitations: A Discussion and Evaluation of Product Metrics 119 <i>M.H. Nagel, A.L.N. Stevels, Delft Univ. of Technology, The Netherlands</i>
10:15	2A-3	The Eco-Check in Relation to Target Costing in Ecodesigning - The Resource-Based View 121 <i>H. Kurunsaari¹, H. Okano¹, F. Roevekamp², ¹Osaka City Univ., ²Sumitomo Bayer Urethanes, Japan</i>
10:40	2A-4	Utilizing EcoDesign Data for Recycling Quotas Complying Disassembly 123 <i>C. Herrmann, M. Ohlendorf, J. Hesselbach, Technical Univ. Braunschweig, Germany</i>

d: Process Technology in Recycling

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9:25	2B-2	Nail Pulling Resistance of Substitute Lumbers Molded from Fiber Wastes 127 <i>S. Hatta¹, T. Kimura¹, H. Gonno¹, K. Kadokura², ¹Kyoto Inst. of Technology, ²Kadokura Trading Company CO, LTD, Japan</i>
9:50	2B-3	Thermal Conductivity of Substitute Lumbers Molded from Fiber Wastes 129 <i>S. Hatta¹, T. Kimura¹, S. Yamamoto¹, K. Kadokura², ¹Kyoto Inst. of Technology, ²Kadokura Trading Company CO, LTD, Japan</i>
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a: LCA in Social System

9:00	2C-1	LCA Evaluation of Reuse / Recycle Impact for Environmental Conscious Industrial Products 133 <i>Y. Sadamichi¹, Y. Kimura², A. Widiyanto¹, S. Kato¹, N. Maruyama¹, A. Nishimura¹, ¹Mie Univ., ²Fuji Electric Co., Ltd., Japan</i>
9:25	2C-2	Evaluation of Effects of Lightening Trucks on Environment by LCA 135 <i>T. Suzuki, T. Hukuyama, H. Zushi, T. Origuchi, J. Takahashi, The Univ. of Tokyo, Japan</i>
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10:15	2C-4	Application of Eco-Efficiency Factor to Mobile Phone and Scanner 139 <i>K. Fuse¹, Y. Horikoshi², T. Kumai¹, T. Taniguchi³, ¹Fujitsu Ltd., ²Fujitsu Laboratories Ltd., ³PFU Ltd., Japan</i>

10:40	2C-5	NICE III Computer Program and Its Application in China	141
		<i>B. Wei, H. Yagita, M. Kobayashi, A. Inaba, M. Sagisaka, AIST, Japan</i>	
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		<i>M. Fargnoli, Univ. of Rome "La Sapienza", Italy</i>	
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		<i>M. Hatori, IBM Japan, Japan</i>	
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		<i>P.-J. Park, K.-M. Lee, Ajou Univ., Korea</i>	
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		<i>M. Ernzer, K. Kopp, Darmstadt Univ. of Technology, Germany</i>	
c: Information System in EcoDesign			
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		<i>J. Hesselbach, C. Herrmann, M. Mansour, Technical Univ. Braunschweig, Germany</i>	
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		<i>Y. Irie, H. Harada, S. Miyamoto, NEC Corporation, Japan</i>	
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		<i>U. Hallmann¹, C. Herrmann¹, M. Ohlendorf², H.J. Yin², ¹LCE Consulting GmbH, ²Technical Univ. Braunschweig, Germany</i>	
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		<i>T. Kumazawa, Y. Hiroshige, N. Haga, Y. Sekiya, S. Arai, Hitachi, Ltd., Japan</i>	
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		<i>W. Wimmer, P. Judmaier, Vienna Univ. of Technology, Austria</i>	
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		<i>H. Harada¹, T. Shiomichi², ¹Kumamoto Univ., ²EXEO LTD., Japan</i>	
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